

US Rates Watch

Follow the money: cash & collateral trends
Jan 31 update**Money map: banks continue to offset deposit outflows**

Bank cash holdings remain elevated with other deposit outflows, bolstered by large time deposit inflows and higher borrowing. FHLB debt continues to be paid down despite continued increases in bank borrowing, implying banks are increasing borrowing from other sources of funding. Borrowing from the BTFP has likely peaked as the Fed changed the rate last week from 1y OIS + 10bps to the IORB rate (currently 5.4%) to discourage potential arbitrage activity. Month-end UST settlements are expected to push repo higher this week as dealers finance increased UST holdings.

Cash: borrowing from BTFP likely peaked

Fed balance sheet data (Exhibit 1) for the week ending Jan 24, showed a \$5b decline in security holdings from QT but a \$6b increase in bank borrowing from the BTFP, which now totals \$168b. Borrowing from the facility continued to trend higher as the rate on the facility declined as Fed cuts were priced in (Exhibit 2). To likely discourage banks using the facility for arbitrage opportunities, the Fed changed the rate on the facility to match the rate on the IORB and will retire the facility on March 11 '24. We do not believe the end of the facility or higher rate will increase bank funding pressures but may encourage more precautionary funding. On the Fed's liability side, ON RRP decline has slowed but continues. On the week ending Jan 24, reserves declined \$103b as cash went into the TGA and ON RRP, but are still \$55b higher YTD (Exhibit 3, Exhibit 4).

Cash: inflows into prime offset gov't fund outflows

Over the week ending Jan 29 MMF AUM increased \$6b according to Crane (Exhibit 5), with inflows into prime funds but outflows out of government and muni funds. Prime fund inflows of \$13b were primarily into institutional funds but gov't fund outflows were primarily out of institutional funds, leaving institutional funds flat on the week. We expect ongoing but slowing MMF inflows with an inverted yield curve (Exhibit 7).

Cash: banks increased cash assets despite deposit outflow

Bank balance sheet data, which is lagged an additional week compared to Fed balance sheet data, shows banking system assets increased \$51b on the week ending Jan 17, with domestic bank assets up \$48b, all from large banks (Exhibit 8). On the asset side, domestic banks increased cash holdings by \$35b but reduced repo & FF by \$17b. On the liability side, domestic banks saw \$2b in deposit outflows as small deposit outflows slightly outpaced inflows into large time deposits. At the same time, banks continued to increase their other borrowings.

31 January 2024

Rates Research
United States

Katie Craig
Rates Strategist
BofAS
+1 646 743 7016
katie.craig@bofa.com

Mark Cabana, CFA
Rates Strategist
BofAS
+1 646 743 7013
mark.cabana@bofa.com

US Rates Research
BofAS
+1 646 855 8846

[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
YE: Year-end
AGY: Agency debt

Trading ideas and investment strategies discussed herein may give rise to significant risk and are not suitable for all investors. Investors should have experience in relevant markets and the financial resources to absorb any losses arising from applying these ideas or strategies.

BofA Securities does and seeks to do business with issuers covered in its research reports. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.
Refer to important disclosures on page 9 to 11.

12653354

Timestamp: 31 January 2024 07:49AM EST

Cash bottom line: Reserve balances declined on the week ending Jan 24, but likely reversed as cash has since left ON RRP. Gov't institutional funds continue to see outflows offset by prime institutional inflows. Banks continue to borrow and issue large time deposits to offset other deposit outflows.

Collateral: UST issuance likely to drive funding higher

UST issuance is \$128b higher MTD, \$110b from bills which have surprised to the upside. Jan debt issuance implies a higher deficit than in prior Januarys which typically see cuts to bill supply from a budget surplus. See our refunding preview here: [UST refunding preview](#). Treasury's quarterly financing estimates on Monday imply the Jan trend in higher deficits may not be continued over the quarter.

FHLB debt is \$39b higher YTD but declined \$4.5b on the week ending Jan 26b according to our estimates. FHLB paydowns have continued despite higher bank borrowing in the H8 data, implying banks are turning to other sources of funding. Since the bank stress events in March, FHLB debt is roughly \$50b lower according to our estimates (Exhibit 10). The trend in FHLB paydowns is likely to continue as bank demand for borrowing from FHLB declines due to regulatory guidance and Fed cuts get priced in.

CP issuance: Data from the Federal Reserve shows that on the week ending Jan 24 CP outstanding increased \$2b, with a \$3.2b decline in financial CP but \$5.3b increase in non-financial CP (Exhibit 12).

Collateral bottom line: late Jan UST settlements have started to put upward pressure on repo which should see higher SOFR at Jan month-end. FHLB paydowns likely to continue and offset some of the upward pressure in funding from higher UST issuance.

Funding: repo activity to increase around UST settlement

Dealer holdings, which are 1-week lagged, show an \$8b decline in Treasury holdings on the week ending Jan 17 (Exhibit 13), with a \$13b decline in bill holdings partially offset by a \$5b increase in coupon holdings. Dealer coupon holdings increased following January mid-month settlements which led to upward pressure in SOFR on Jan 16 & 17.

Repo volumes: SOFR volumes spiked with mid-month settlements on Jan 16, which coincided with a higher repo print (Exhibit 16). Last week's higher volumes in SOFR also coincided with upward pressure in SOFR which have since reversed. We expect upward pressure around month-end coupon settlements around both repo rates and volumes. Sponsored repo volumes are little changed on the week ending Jan 29. GC and bilateral sponsored volumes have both come down from their peaks but higher on the week (Exhibit 17). The decline in sponsored GC came alongside declines in repo rates as well as institutional MMF outflows, which are likely the primary lender in sponsored GC.

Funding bottom line: repo volumes and rates continue to move higher on large settlement dates. Repo trading over the month-end turn has seen upward pressure, implying month-end is likely to result in higher repo rates again in Jan.

Key takeaway: Bank reserve balances declined last week but have likely reversed as ON RRP has declined. The BTFP has likely peaked as the Fed changed the rate from 1y OIS + 10bps to the IORB (currently 5.4%) to discourage potential arbitrage activity. FHLB debt continues to be paid down despite continued increases in bank borrowing, implying banks are increasing borrowing from other sources of funding. Month-end UST settlements are expected to drive upward pressure in repo this week as dealers finance their higher UST holdings.

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

Cash in banking system exceeded Fed balance sheet growth due to lower ON RRP

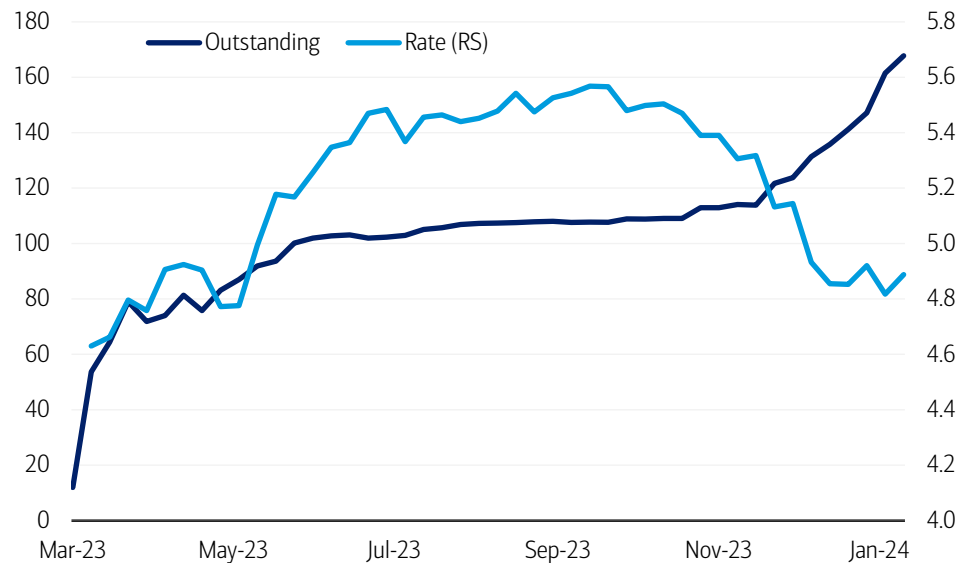
Assets							Liabilities							
Dates	Securities	Repo	Discount Window	BTFP	FX Swaps	Other	Currency	Foreign RRP	ON RRP	TGA	Reserves	Other	Total	
12/27/2023	7,225	0		2	136	1	399	2,345	347	819	713	3,434	106	7,764
1/17/2024	7,158	0		2	162	0	403	2,336	346	590	774	3,592	86	7,725
1/24/2024	7,153	0		3	168	0	404	2,329	341	640	815	3,490	114	7,728
WoW Change	-5	0		0	6	0	1	-6	-6	49	42	-103	27	3
YTD Change	-71	0		0	32	-1	5	-15	-6	-179	102	55	8	-36

Source: BofA Global Research, Federal Reserve

BofA GLOBAL RESEARCH

Exhibit 2: Weekly BTFP outstanding (\$b) and average rate (%)

As the rate on 1y OIS declined over the last few months, take-up of the facility has increased



Source: BofA Global Research, Federal Reserve, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 3: Fed reserve balances outstanding (\$bn)

Reserve balances declined \$102.62bn from the prior week



Source: Federal Reserve

BofA GLOBAL RESEARCH

Exhibit 4: ON RRP take-up (\$bn)

ON RRP take-up decreased \$43.44bn from prior week



Source: FRBNY

BofA GLOBAL RESEARCH



Exhibit 5: Daily Crane MMF AUM (\$bn)

MMF AUM grew \$6b WoW as of Jan 29, with inflows into retail MMFs

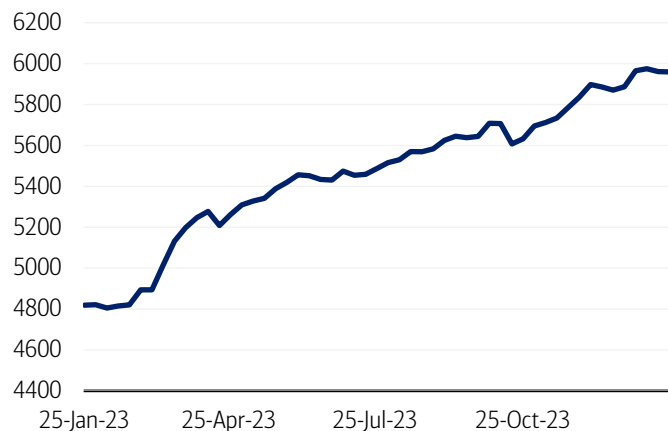
Dates	Total	Prime	Gov't	Tax exempt	Retail	Institutional	Prime Institutional	Gov't Institutional	Prime Retail	Gov't Retail
12/29/2023	6,300	1,308	4,862	131	2,232	3,937	616	3,322	692	1,540
1/22/2024	6,355	1,353	4,877	126	2,275	3,955	639	3,315	713	1,561
1/29/2024	6,361	1,366	4,870	124	2,282	3,955	650	3,305	716	1,566
WoW change	6	13	-6	-1	7	0	10	-11	3	4
YTD change	61	58	9	-7	50	17	34	-17	24	26

Source: Crane Data

BofA GLOBAL RESEARCH

Exhibit 6: MMF AUM (\$bn)

MMFs saw \$1.39bn in outflows from prior week as of Jan 24

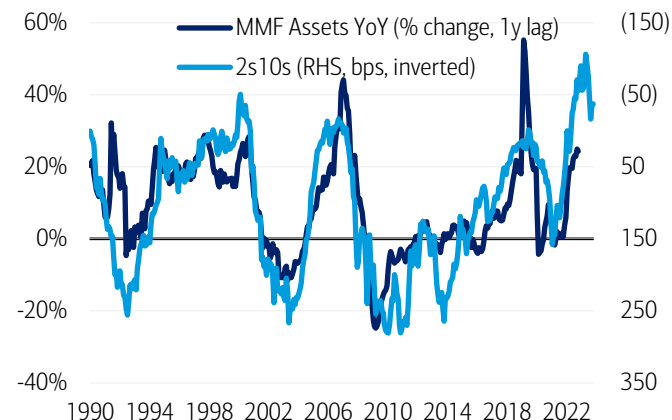


Source: ICI, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 7: MMF assets and 2s10s curve

MMF assets are typically negatively correlated to the yield curve with a lag



Source: BofA Global Research, Federal Reserve, Haver

BofA GLOBAL RESEARCH

Exhibit 8: US Commercial Bank balance sheets, selected assets & liabilities (\$bn)

Domestic bank assets increased due to deposit inflows which went into UST & Agy securities, repo & FF, and loans & leases

		Total	Assets						Liabilities					
			Cash	UST & Agy	MBS	Repo & FF	Loans & Leases	Other	Deposits	Large	Small	Borrowings	Net due to related foreign offices	Other
All	1/17/2024	23326	3613	1556	2543	628	12287	2700	17510	2326	15184	2429	341	3046
Banks	1w Chg	51	50	-11	18	-16	-14	25	9	14	-5	9	11	22
	1m Chg	15	101	-34	34	-27	-70	13	-81	48	-128	65	7	17614
	1y Chg	295	395	-103	-160	44	259	-140	-286	622	-908	522	-40	17895
Domestic	1/17/2024	20153	2269	1436	2516	247	11209	2477	16197	1511	14686	1386	-316	2886
Banks	1w Chg	48	35	-14	19	-17	-8	32	-2	15	-18	12	6	32
	1m Chg	-68	13	-44	36	-31	-58	16	-114	39	-153	36	-18	16339
	1y Chg	237	446	-113	-154	-57	229	-114	-281	662	-943	381	26	16590
Large	1/17/2024	13552	1800	1142	1931	218	6739	1723	10878	831	10047	962	-348	2060
Banks	1w Chg	48	34	-13	20	-16	-11	34	5	9	-4	9	6	28
	1m Chg	-71	17	-44	26	-30	-60	19	-94	22	-116	31	-20	10983
	1y Chg	189	366	-82	-4	-40	26	-77	-222	420	-643	344	31	11136
Small	1/17/2024	6601	469	294	585	29	4470	754	5319	681	4639	424	32	826
Banks	1w Chg	0	2	-2	-1	0	3	-2	-7	6	-14	3	0	4
	1m Chg	3	-4	0	10	-1	2	-3	-20	17	-37	4	2	5356
	1y Chg	48	80	-30	-150	-17	202	-37	-59	241	-300	37	-5	5453
Foreign	1/17/2024	3174	1345	120	27	381	1078	222	1313	815	498	1043	658	160
Banks	1w Chg	3	14	3	-1	1	-6	-7	12	-2	13	-3	4	-10
	1m Chg	83	88	9	-2	3	-13	-3	33	8	25	30	25	1276
	1y Chg	58	-51	10	-6	101	31	-27	-5	-39	35	141	-66	1306

Source: Federal Reserve H8

BofA GLOBAL RESEARCH



Exhibit 9: Treasury bill and coupon issuance (\$000s)

Treasury issuance has increased \$51b MTD in January, due to \$33B in bill issuance, \$18b in coupon issuance

	Net total	Net bills	Net coupons	Gross new issue	Gross bill issue	Gross coupon issue	Gross maturing	Gross bill maturing	Gross coupon maturing
MTD	128,202	110,112	18,090	1,917,000	1,807,000	110,000	1,788,798	1,696,888	91,910
YTD	128,202	110,112	18,090	1,917,000	1,807,000	110,000	1,788,798	1,696,888	91,910
FYTD	933,831	548,543	385,288	8,970,000	7,918,000	1,052,000	8,036,169	7,369,457	666,712

Source: BofA Global Research, Haver Analytics

BofA GLOBAL RESEARCH

Exhibit 10: Cumulative growth in FHLB debt since March 1 (\$bn)

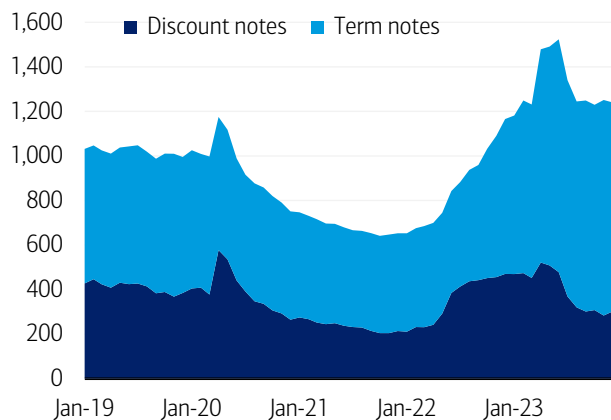
Daily FHLB cumulative debt is roughly \$73.5502bn lower since March 1



Source: Bloomberg, FHLB Office of Finance. Note: we use estimates of daily net issuance
BofA GLOBAL RESEARCH

Exhibit 11: FHLB debt issuance (\$bn)

FHLB supply has been flat to lower

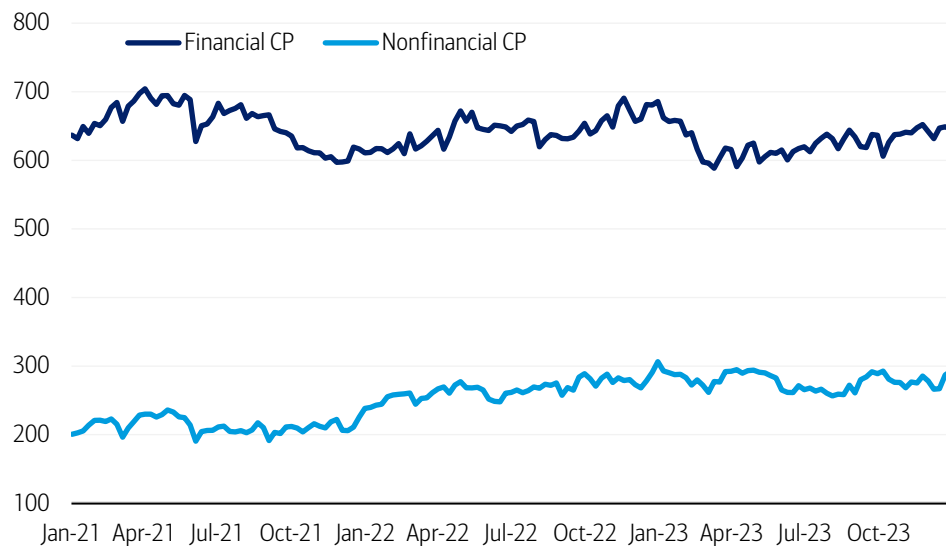


Source: BofA Global Research, FHLB Office of Finance

BofA GLOBAL RESEARCH

Exhibit 12: Commercial paper (\$bn)

CP outstanding increased \$2b last week from non-financial CP



Source: Bloomberg

BofA GLOBAL RESEARCH

Exhibit 13: Primary dealer holdings (\$mn)

PD holdings of UST is \$32b higher WoW driven by increases across all asset types. Data as of Dec 27

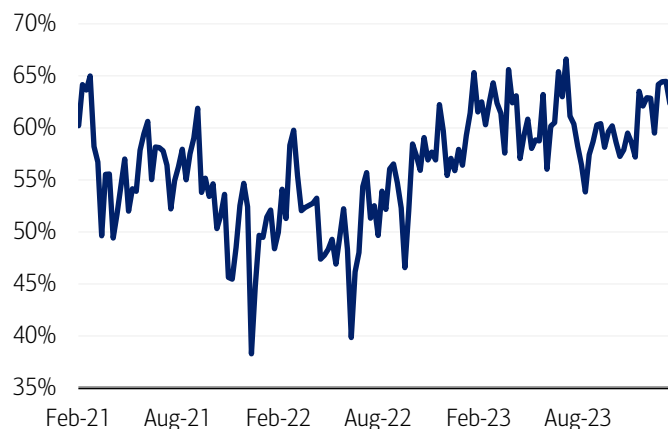
	Total	US Treasuries					Agency ex MBS	MBS	Corporates	Commercial Paper	State & Munis	ABS	Variable Rate Notes
		Bills	Coupons	FRNs	TIPS								
1/17/2024	393,884	245,518	49,182	169,934	9,113	17,289	12,458	96,052	13,720	6,694	13,252	7,796	5,088
Chg WoW	172	-8,331	-12,843	5,028	-1,231	715	2,289	-428	-507	979	3,789	194	3,166
Chg MoM	17,598	21,598	-2,612	18,830	4,747	633	-1,761	-598	-1,742	800	-1,218	139	1,180
Chg since DL	9,173	2,330	-38,071	41,175	3,718	-4,492	-4,069	15,207	-4,422	-2,876	-1,625	677	1,075

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 14: PD UST holdings as a % of total holdings

Latest level 62% as of Jan 17



Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 16: SOFR volumes (\$bn)

SOFR volumes increased \$3bn from prior week as of Jan 29



Source: FRBNY

BofA GLOBAL RESEARCH

Exhibit 15: PD UST holdings by security type (\$mn)

PD holdings of bills are still higher than avg but declining

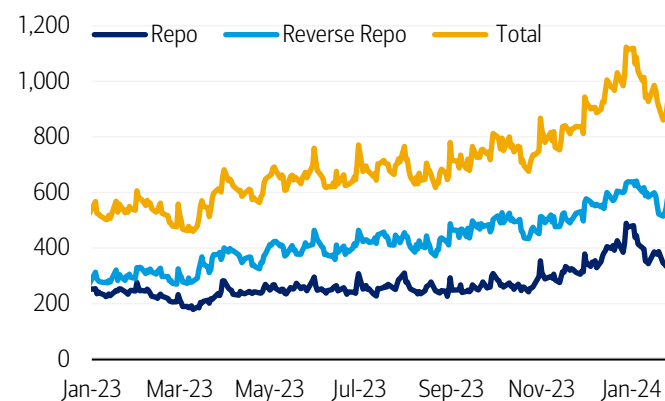
	Bills	Coupons	FRNs	TIPS	Total
12/20/2023	51,794	151,104	4,366	16,656	223,920
1/17/2024	49,182	169,934	9,113	17,289	245,518
MoM Change	(2,612)	18,830	4,747	633	21,598
Level Z-score	0.28	1.00	0.32	1.23	1.06

BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 17: Sponsored Repo Volumes (\$bn)

Sponsored repo volumes have risen \$1 from prior week

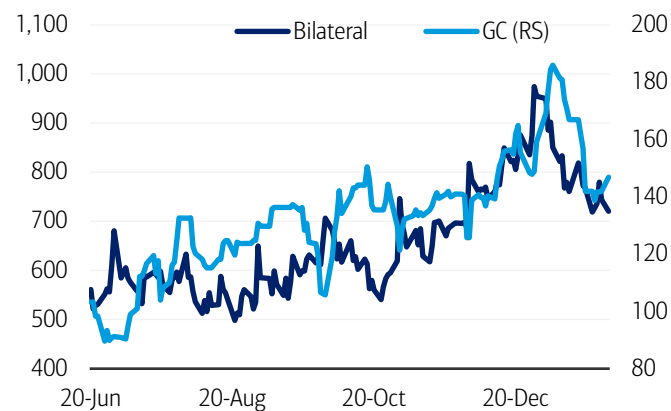


Source: OFR

BofA GLOBAL RESEARCH

Exhibit 18: Sponsored repo volumes by transaction type (\$bn)

Sponsored GC repo volumes have fallen quickly alongside lower rates



Source: OFR

BofA GLOBAL RESEARCH

Appendix

Exhibit 19: 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
1/2/2024	24,679	4,493	1,875	(14,254)	1,250	82	45	(115)	(35)	18,020
1/3/2024	24,353	2,899	-	(29,469)	3,478	1,065	23	(1,435)	(1,204)	(290)
1/4/2024	21,288	2,972	3,100	(26,103)	800	1,080	13	(250)	(50)	2,850
1/5/2024	17,280	1,749	-	(28,925)	3,175	170	180	(4,065)	(540)	(10,976)
1/8/2024	18,069	1,999	-	(20,944)	2,600	345	2,623	(650)	(130)	3,913
1/9/2024	21,850	2,759	4,375	(19,553)	2,265	180	370	(1,760)	-	10,486
1/10/2024	24,567	1,954	-	(26,616)	2,250	1,630	799	(1,408)	(320)	2,857
1/11/2024	14,950	1,621	2,800	(21,683)	2,125	1,925	255	-	(100)	1,893
1/12/2024	15,917	3,124	-	(27,572)	6,780	435	105	(2,810)	(1,360)	(5,381)
1/16/2024	18,920	1,939	3,340	(18,564)	7,425	257	250	(802)	(615)	12,151
1/17/2024	22,522	4,928	-	(26,733)	500	1,230	313	(4,125)	(70)	(1,435)
1/18/2024	19,668	4,011	5,355	(24,179)	750	1,558	808	(1,670)	(150)	6,151
1/19/2024	16,765	5,439	-	(25,882)	9,450	472	90	(3,092)	(115)	3,127
1/22/2024	14,050	4,693	-	(20,401)	4,500	1,295	506	(920)	(775)	2,948
1/23/2024	14,405	5,032	1,425	(15,686)	3,450	330	-	(1,385)	(410)	7,162
1/24/2024	15,622	2,994	-	(24,186)	2,900	373	131	(5,155)	(405)	(7,727)
1/25/2024	16,700	3,664	2,360	(18,420)	200	1,270	145	(3,725)	(240)	1,953
1/26/2024	19,504	1,050	-	(22,427)	2,675	1,475	45	(7,150)	(4,040)	(8,868)

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

BofA GLOBAL RESEARCH

Disclosures

Important Disclosures

BofA Global Research personnel (including the analyst(s) responsible for this report) receive compensation based upon, among other factors, the overall profitability of Bank of America Corporation, including profits derived from investment banking. The analyst(s) responsible for this report may also receive compensation based upon, among other factors, the overall profitability of the Bank's sales and trading businesses relating to the class of securities or financial instruments for which such analyst is responsible. BofA Securities fixed income analysts regularly interact with sales and trading desk personnel in connection with their research, including to ascertain pricing and liquidity in the fixed income markets.

Other Important Disclosures

Prices are indicative and for information purposes only. Except as otherwise stated in the report, for any recommendation in relation to an equity security, the price referenced is the publicly traded price of the security as of close of business on the day prior to the date of the report or, if the report is published during intraday trading, the price referenced is indicative of the traded price as of the date and time of the report and in relation to a debt security (including equity preferred and CDS), prices are indicative as of the date and time of the report and are from various sources including BofA Securities trading desks.

The date and time of completion of the production of any recommendation in this report shall be the date and time of dissemination of this report as recorded in the report timestamp.

This report may refer to fixed income securities or other financial instruments that may not be offered or sold in one or more states or jurisdictions, or to certain categories of investors, including retail investors. Readers of this report are advised that any discussion, recommendation or other mention of such instruments is not a solicitation or offer to transact in such instruments. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor for information relating to such instruments.

Rule 144A securities may be offered or sold only to persons in the U.S. who are Qualified Institutional Buyers within the meaning of Rule 144A under the Securities Act of 1933, as amended. SECURITIES OR OTHER FINANCIAL INSTRUMENTS DISCUSSED HEREIN MAY BE RATED BELOW INVESTMENT GRADE AND SHOULD THEREFORE ONLY BE CONSIDERED FOR INCLUSION IN ACCOUNTS QUALIFIED FOR SPECULATIVE INVESTMENT.

Recipients who are not institutional investors or market professionals should seek the advice of their independent financial advisor before considering information in this report in connection with any investment decision, or for a necessary explanation of its contents.

The securities or other financial instruments discussed in this report may be traded over-the-counter. Retail sales and/or distribution of this report may be made only in states where these instruments are exempt from registration or have been qualified for sale.

Officers of BofAS or one or more of its affiliates (other than research analysts) may have a financial interest in securities of the issuer(s) or in related investments.

This report, and the securities or other financial instruments discussed herein, may not be eligible for distribution or sale in all countries or to certain categories of investors, including retail investors.

Refer to [BofA Global Research policies relating to conflicts of interest](#).

"BofA Securities" includes BofA Securities, Inc. ("BofAS") and its affiliates. Investors should contact their BofA Securities representative or Merrill Global Wealth Management financial advisor if they have questions concerning this report or concerning the appropriateness of any investment idea described herein for such investor. "BofA Securities" is a global brand for BofA Global Research.

Information relating to Non-US affiliates of BofA Securities and Distribution of Affiliate Research Reports:

BofAS and/or Merrill Lynch, Pierce, Fenner & Smith Incorporated ("MLPF&S") may in the future distribute, information of the following non-US affiliates in the US (short name: legal name, regulator): Merrill Lynch (South Africa): Merrill Lynch South Africa (Pty) Ltd., regulated by The Financial Service Board; MLI (UK): Merrill Lynch International, regulated by the Financial Conduct Authority (FCA) and the Prudential Regulation Authority (PRA); BofASE (France): BofA Securities Europe SA is authorized by the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers (AMF). BofA Securities Europe SA ("BofASE") with registered address at 51, rue La Boétie, 75008 Paris is registered under no 842 602 690 RCS Paris. In accordance with the provisions of French Code Monétaire et Financier (Monetary and Financial Code), BofASE is an établissement de crédit et d'investissement (credit and investment institution) that is authorised and supervised by the European Central Bank and the Autorité de Contrôle Prudentiel et de Résolution (ACPR) and regulated by the ACPR and the Autorité des Marchés Financiers. BofASE's share capital can be found at www.bofam.com/BofASEdisclaimer; BofA Europe (Milan): Bank of America Europe Designated Activity Company, Milan Branch, regulated by the Bank of Italy, the European Central Bank (ECB) and the Central Bank of Ireland (CBI); BofA Europe (Frankfurt): Bank of America Europe Designated Activity Company, Frankfurt Branch regulated by BaFin, the ECB and the CBI; BofA Europe (Madrid): Bank of America Europe Designated Activity Company, Sucursal en España, regulated by the Bank of Spain, the ECB and the CBI; Merrill Lynch (Australia): Merrill Lynch Equities (Australia) Limited, regulated by the Australian Securities and Investments Commission; Merrill Lynch (Hong Kong): Merrill Lynch (Asia Pacific) Limited, regulated by the Hong Kong Securities and Futures Commission (HKSF); Merrill Lynch (Singapore): Merrill Lynch (Singapore) Pte Ltd, regulated by the Monetary Authority of Singapore (MAS); Merrill Lynch (Canada): Merrill Lynch Canada Inc, regulated by the Canadian Investment Regulatory Organization; Merrill Lynch (Mexico): Merrill Lynch Mexico, SA de CV, Casa de Bolsa, regulated by the Comisión Nacional Bancaria y de Valores; Merrill Lynch (Argentina): Merrill Lynch Argentina SA, regulated by Comisión Nacional de Valores; BofAS Japan: BofA Securities Japan Co., Ltd., regulated by the Financial Services Agency; Merrill Lynch (Seoul): Merrill Lynch International, LLC Seoul Branch, regulated by the Financial Supervisory Service; Merrill Lynch (Taiwan): Merrill Lynch Securities (Taiwan) Ltd., regulated by the Securities and Futures Bureau; BofAS India: BofA Securities India Limited, regulated by the Securities and Exchange Board of India (SEBI); Merrill Lynch (Israel): Merrill Lynch Israel Limited, regulated by Israel Securities Authority; Merrill Lynch (DIFC): Merrill Lynch International (DIFC Branch), regulated by the Dubai Financial Services Authority (DFSA); Merrill Lynch (Brazil): Merrill Lynch S.A. Corretora de Títulos e Valores Mobiliários, regulated by Comissão de Valores Mobiliários; Merrill Lynch KSA Company: Merrill Lynch Kingdom of Saudi Arabia Company, regulated by the Capital Market Authority.

This information: has been approved for publication and is distributed in the United Kingdom (UK) to professional clients and eligible counterparties (as each is defined in the rules of the FCA and the PRA) by MLI (UK), which is authorized by the PRA and regulated by the FCA and the PRA - details about the extent of our regulation by the FCA and PRA are available from us on request; has been approved for publication and is distributed in the European Economic Area (EEA) by BofASE (France), which is authorized by the ACPR and regulated by the ACPR and the AMF; has been considered and distributed in Japan by BofAS Japan, a registered securities dealer under the Financial Instruments and Exchange Act in Japan, or its permitted affiliates; is issued and distributed in Hong Kong by Merrill Lynch (Hong Kong) which is regulated by HKSF; is issued and distributed in Taiwan by Merrill Lynch (Taiwan); is issued and distributed in India by BofAS India; and is issued and distributed in Singapore to institutional investors and/or accredited investors (each as defined under the Financial Advisers Regulations) by Merrill Lynch (Singapore) (Company Registration No 198602883D). Merrill Lynch (Singapore) is regulated by MAS. Merrill Lynch Equities (Australia) Limited (ABN 65 006 276 795), AFS License 235132 (MLEA) distributes this information in Australia only to 'Wholesale' clients as defined by s.761G of the Corporations Act 2001. With the exception of Bank of America N.A., Australia Branch, neither MLEA nor any of its affiliates involved in preparing this information is an Authorised Deposit-Taking Institution under the Banking Act 1959 nor regulated by the Australian Prudential Regulation Authority. No approval is required for publication or distribution of this information in Brazil and its local distribution is by Merrill Lynch (Brazil) in accordance with applicable regulations. Merrill Lynch (DIFC) is authorized and regulated by the DFSA. Information prepared and issued by Merrill Lynch (DIFC) is done so in accordance with the requirements of the DFSA conduct of business rules. BofA Europe (Frankfurt) distributes this information in Germany and is regulated by BaFin, the ECB and the CBI. BofA Securities entities, including BofA Europe and BofASE (France), may outsource/delegate the marketing and/or provision of certain research services or aspects of research services to other branches or members of the BofA Securities group. You may be contacted by a different BofA Securities entity acting for and on behalf of your service provider where permitted by applicable law. This does not change your service provider. Please refer to the [Electronic](#)



[Communications Disclaimers](#) for further information.

This information has been prepared and issued by BofAS and/or one or more of its non-US affiliates. The author(s) of this information may not be licensed to carry on regulated activities in your jurisdiction and, if not licensed, do not hold themselves out as being able to do so. BofAS and/or MLPF&S is the distributor of this information in the US and accepts full responsibility for information distributed to BofAS and/or MLPF&S clients in the US by its non-US affiliates. Any US person receiving this information and wishing to effect any transaction in any security discussed herein should do so through BofAS and/or MLPF&S and not such foreign affiliates. Hong Kong recipients of this information should contact Merrill Lynch (Asia Pacific) Limited in respect of any matters relating to dealing in securities or provision of specific advice on securities or any other matters arising from, or in connection with, this information. Singapore recipients of this information should contact Merrill Lynch (Singapore) Pte Ltd in respect of any matters arising from, or in connection with, this information. For clients that are not accredited investors, expert investors or institutional investors Merrill Lynch (Singapore) Pte Ltd accepts full responsibility for the contents of this information distributed to such clients in Singapore.

General Investment Related Disclosures:

Taiwan Readers: Neither the information nor any opinion expressed herein constitutes an offer or a solicitation of an offer to transact in any securities or other financial instrument. No part of this report may be used or reproduced or quoted in any manner whatsoever in Taiwan by the press or any other person without the express written consent of BofA Securities.

This document provides general information only, and has been prepared for, and is intended for general distribution to, BofA Securities clients. Neither the information nor any opinion expressed constitutes an offer or an invitation to make an offer, to buy or sell any securities or other financial instrument or any derivative related to such securities or instruments (e.g., options, futures, warrants, and contracts for differences). This document is not intended to provide personal investment advice and it does not take into account the specific investment objectives, financial situation and the particular needs of, and is not directed to, any specific person(s). This document and its content do not constitute, and should not be considered to constitute, investment advice for purposes of ERISA, the US tax code, the Investment Advisers Act or otherwise. Investors should seek financial advice regarding the appropriateness of investing in financial instruments and implementing investment strategies discussed or recommended in this document and should understand that statements regarding future prospects may not be realized. Any decision to purchase or subscribe for securities in any offering must be based solely on existing public information on such security or the information in the prospectus or other offering document issued in connection with such offering, and not on this document.

Securities and other financial instruments referred to herein, or recommended, offered or sold by BofA Securities, are not insured by the Federal Deposit Insurance Corporation and are not deposits or other obligations of any insured depository institution (including Bank of America, N.A.). Investments in general and, derivatives, in particular, involve numerous risks, including, among others, market risk, counterparty default risk and liquidity risk. No security, financial instrument or derivative is suitable for all investors. Digital assets are extremely speculative, volatile and are largely unregulated. In some cases, securities and other financial instruments may be difficult to value or sell and reliable information about the value or risks related to the security or financial instrument may be difficult to obtain. Investors should note that income from such securities and other financial instruments, if any, may fluctuate and that price or value of such securities and instruments may rise or fall and, in some cases, investors may lose their entire principal investment. Past performance is not necessarily a guide to future performance. Levels and basis for taxation may change.

BofA Securities is aware that the implementation of the ideas expressed in this report may depend upon an investor's ability to "short" securities or other financial instruments and that such action may be limited by regulations prohibiting or restricting "shortselling" in many jurisdictions. Investors are urged to seek advice regarding the applicability of such regulations prior to executing any short idea contained in this report.

This report may contain a trading idea or recommendation which highlights a specific identified near-term catalyst or event impacting a security, issuer, industry sector or the market generally that presents a transaction opportunity, but does not have any impact on the analyst's particular "Overweight" or "Underweight" rating (which is based on a three month trade horizon). Trading ideas and recommendations may differ directionally from the analyst's rating on a security or issuer because they reflect the impact of a near-term catalyst or event.

Foreign currency rates of exchange may adversely affect the value, price or income of any security or financial instrument mentioned in this report. Investors in such securities and instruments effectively assume currency risk.

BofAS or one of its affiliates is a regular issuer of traded financial instruments linked to securities that may have been recommended in this report. BofAS or one of its affiliates may, at any time, hold a trading position (long or short) in the securities and financial instruments discussed in this report.

BofA Securities, through business units other than BofA Global Research, may have issued and may in the future issue trading ideas or recommendations that are inconsistent with, and reach different conclusions from, the information presented herein. Such ideas or recommendations may reflect different time frames, assumptions, views and analytical methods of the persons who prepared them, and BofA Securities is under no obligation to ensure that such other trading ideas or recommendations are brought to the attention of any recipient of this information.

In the event that the recipient received this information pursuant to a contract between the recipient and BofAS for the provision of research services for a separate fee, and in connection therewith BofAS may be deemed to be acting as an investment adviser, such status relates, if at all, solely to the person with whom BofAS has contracted directly and does not extend beyond the delivery of this report (unless otherwise agreed specifically in writing by BofAS). If such recipient uses the services of BofAS in connection with the sale or purchase of a security referred to herein, BofAS may act as principal for its own account or as agent for another person. BofAS is and continues to act solely as a broker-dealer in connection with the execution of any transactions, including transactions in any securities referred to herein.

Copyright and General Information:

Copyright 2024 Bank of America Corporation. All rights reserved. iQdatabase® is a registered service mark of Bank of America Corporation. This information is prepared for the use of BofA Securities clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of BofA Securities. BofA Global Research information is distributed simultaneously to internal and client websites and other portals by BofA Securities and is not publicly-available material. Any unauthorized use or disclosure is prohibited. Receipt and review of this information constitutes your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion, or information contained herein (including any investment recommendations, estimates or price targets) without first obtaining express permission from an authorized officer of BofA Securities.

Materials prepared by BofA Global Research personnel are based on public information. Facts and views presented in this material have not been reviewed by, and may not reflect information known to, professionals in other business areas of BofA Securities, including investment banking personnel. BofA Securities has established information barriers between BofA Global Research and certain business groups. As a result, BofA Securities does not disclose certain client relationships with, or compensation received from, such issuers. To the extent this material discusses any legal proceeding or issues, it has not been prepared as nor is it intended to express any legal conclusion, opinion or advice. Investors should consult their own legal advisers as to issues of law relating to the subject matter of this material. BofA Global Research personnel's knowledge of legal proceedings in which any BofA Securities entity and/or its directors, officers and employees may be plaintiffs, defendants, co-defendants or co-plaintiffs with or involving issuers mentioned in this material is based on public information. Facts and views presented in this material that relate to any such proceedings have not been reviewed by, discussed with, and may not reflect information known to, professionals in other business areas of BofA Securities in connection with the legal proceedings or matters relevant to such proceedings.

This information has been prepared independently of any issuer of securities mentioned herein and not in connection with any proposed offering of securities or as agent of any issuer of any securities. None of BofAS or any of its affiliates or their research analysts has any authority whatsoever to make any representation or warranty on behalf of the issuer(s). BofA Global Research policy prohibits research personnel from disclosing a recommendation, investment rating, or investment thesis for review by an issuer prior to the publication of a research report containing such rating, recommendation or investment thesis.

Any information relating to the tax status of financial instruments discussed herein is not intended to provide tax advice or to be used by anyone to provide tax advice. Investors are urged to seek tax advice based on their particular circumstances from an independent tax professional.

The information herein (other than disclosure information relating to BofA Securities and its affiliates) was obtained from various sources and we do not guarantee its accuracy. This information may contain links to third-party websites. BofA Securities is not responsible for the content of any third-party website or any linked content contained in a third-party website. Content contained on such third-party websites is not part of this information and is not incorporated by reference. The inclusion of a link does not imply any endorsement by or any affiliation with BofA Securities. Access to any third-party website is at your own risk, and you should always review the terms and privacy policies at third-party websites before submitting any personal information to them. BofA Securities is not responsible for such terms and privacy policies and expressly disclaims any liability for them.

All opinions, projections and estimates constitute the judgment of the author as of the date of publication and are subject to change without notice. Prices also are subject to change without notice. BofA Securities is under no obligation to update this information and BofA Securities ability to publish information on the subject issuer(s) in the future is subject to applicable quiet periods. You should therefore assume that BofA Securities will not update any fact, circumstance or opinion contained herein.

Certain outstanding reports or investment opinions relating to securities, financial instruments and/or issuers may no longer be current. Always refer to the most recent research report relating to an issuer prior to making an investment decision.

In some cases, an issuer may be classified as Restricted or may be Under Review or Extended Review. In each case, investors should consider any investment opinion relating to such issuer (or its security and/or financial instruments) to be suspended or withdrawn and should not rely on the analyses and investment opinion(s) pertaining to such issuer (or its securities and/or financial

instruments) nor should the analyses or opinion(s) be considered a solicitation of any kind. Sales persons and financial advisors affiliated with BofAS or any of its affiliates may not solicit purchases of securities or financial instruments that are Restricted or Under Review and may only solicit securities under Extended Review in accordance with firm policies. Neither BofA Securities nor any officer or employee of BofA Securities accepts any liability whatsoever for any direct, indirect or consequential damages or losses arising from any use of this information.

Research Analysts

Ralph Axel

Rates Strategist
BofAS
ralph.axel@bofa.com

Bruno Braizinha, CFA

Rates Strategist
BofAS
bruno.braizinha@bofa.com

Mark Cabana, CFA

Rates Strategist
BofAS
mark.cabana@bofa.com

Katie Craig

Rates Strategist
BofAS
katie.craig@bofa.com

Meghan Swiber, CFA

Rates Strategist
BofAS
meghan.swiber@bofa.com

Anna (Caiyi) Zhang

Rates Strategist
BofAS
cai yi.zhang@bofa.com

Trading ideas and investment strategies discussed herein may give rise to significant risk and are not suitable for all investors. Investors should have experience in relevant markets and the financial resources to absorb any losses arising from applying these ideas or strategies.