

US Rates Watch

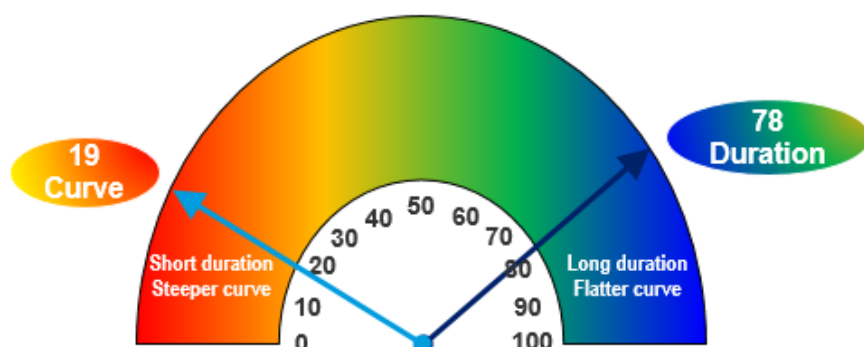
Foreign official selling, Pension fund demand cooling

No sign of circuit breaker

Persistence of fund inflows and continued extension of duration from asset managers was not enough to offset the momentum for higher rates last week. The absence of capitulation from investment funds despite the recent price action concerns us, as any pullback remains an outstanding risk going forward. Two buyer types that we have seen adjust are foreign official accounts and pensions. Foreign official institutions are likely selling to finance intervention, but this flow is more concentrated at the front-end of the curve. While we have no real-time data on pension flow, stripping activity points to a slowing bid for long duration despite the continued improvement in funded status.

Exhibit 1: Curve-o-meter

CTAs and hedge funds are in steepeners, speculators excluding leveraged funds are long



Source: BofA Global Research, Note: dials show 5y percentiles for the average non-commercial ex leverage funds & proxy of futures positioning for duration and the average of CTA betas and our proxy for futures positioning for the curve.

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Bias likely for continued bear steepening

Our futures positioning proxy (for construction details see: [Gauging positioning in Treasury Futures](#)) shows a bias for continued bear steepening given the concentration of out of the money longs at the back end of the curve (Exhibit 12). On the week through Thursday, open interest increased with shorts created across the curve and longs created primarily at the front-end.

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.

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UST= Treasury security

CTA= Commodity trading advisor

OTM= out of the money

ITM=in the money

ED= Eurodollars

TIC=Treasury International Capital

QT= quantitative tightening

MoF= ministry of finance

COB = close of business

SFR = SOFR futures contract

TU = Treasury 2Y futures contract

FV = Treasury 5Y contract

TY = Treasury 10Y contract

UXY = Treasury ultra 10Y contract

US = Treasury 20Y contract

WN = Treasury 30Y contract

TGA= Treasury General Account

TR FI funds = Total return fixed income funds

PPTS = percentage points

JGB = Japanese government bonds

FoF = flow of funds

Demand from asset managers continues

Asset managers hit new record highs in 10y equivalent futures positions the week ending October 3rd (Exhibit 7). Longs were added to the greatest extent in UXY and TU while positions were reduced in WN. Leveraged hedge funds took the other side, with large shorts added UXY but covered shorts in TY and US. Speculative positioning excluding leveraged funds increased slightly on the week and sits around the 75th percentile over the last 5 yrs (Exhibit 8).

CTAs likely only modest contributors to selloff

While the selloff persisted this past week, our top-down model (see: [CTA impact on the rates market](#)) and cross over momentum signal both suggest that CTAs were only modest contributors to the move. Beta of returns to the 10y was slightly lower on the week (Exhibit 15) and momentum has generally indicated relatively stable shorts (Exhibit 13). Non-reportable CFTC positioning contradicts the maintenance of short positioning and shows an add to duration for the fourth consecutive week (Exhibit 16). This may reflect activity of other investors besides CTA and momentum strategies or some profit taking of shorts.

Our indicators also continue to reflect that CTAs are meaningfully in steepeners (Exhibit 14). A key risk to the steepener position that we also continue to favor—is a flip in momentum which would likely drive material covering from CTAs and exacerbate flattening moves.

Foreign official selling may reflect FX intervention

Following the sharp move in the JPY after hitting 150 vs the USD last week, a common client question has been whether the official sector is selling USTs to finance FX intervention. Federal Reserve balance sheet data released last Thursday suggests this is quite likely. Custodial holdings declined \$12bn the week ending October 4th alongside a \$22bn drop in the foreign RRP (Exhibit 32). The decline in both suggest that the official sector is reducing overall USD cash & UST holdings held at the Fed. Two weeks ago (see: [US Rates Watch](#)), we had flagged a notable \$30bn build in the foreign RRP without a drop in cash UST holdings—which may have indicated a build of liquidity in preparation for intervention.

As discussed in [FX intervention: another potential headwind to UST demand](#), the official sector may be more inclined to finance intervention through cash holdings vs USTs given the pickup of short-term securities vs what investors can earn in the RRP. While this may to some extent offset front-end sales, the official sector may on net seek to maintain a certain level of USD liquidity requiring fewer UST reinvestments/ less bid for front-end securities and sales on the margin as evidenced in this week's data.

Funds likely still dip buyers

Flows into UST funds remain in line with the pace observed in recent weeks (Exhibit 33). Inflows to fixed income funds picked up overall this past week and were largely concentrated in short-term UST and mixed allocation/ Agg benchmark funds. The persistence of inflows is a sign that last week's selloff occurred despite a continued influx of cash into UST funds. We remain concerned that outflows could exacerbate rate selloffs. However, as shown in Exhibit 37, since the start of the Fed hiking cycle, inflows have persisted regardless of returns.

For the second consecutive week, total return fixed income funds broadly underperformed benchmarks alongside the rates selloff (Exhibit 38). While this may be related to other positions (i.e. a long MBS), the data continue to suggest that these funds have not materially reduced duration allocations over the past two weeks.

Pension demand cools despite funded status improvement

The Milliman 100 Index for September showed only a small improvement in funded status despite the sharp increase in longer-tenor interest rates (Exhibit 56). According to

Milliman, the loss on the asset side was one of the worst return months of the year but was offset by the decline in value of liabilities. While funded status overall suggests that pensions should be moving towards higher fixed income allocations and de-risking, stripping activity reflected a decline in demand for long duration USTs in September (Exhibit 58).

While the DB pension fund universe de-risking entirely would result in a meaningful bid for duration (see: [Pension de-risking](#)), the slower steadier demand may not offset the impact of the increase in longer-dated issuance. We expect a \$75bn increase in gross issuance at the nominal 20y & 30y points in FY 24 vs FY 23. This trumps the recent peak in 12mo stripping activity and UST buying from private DB pensions according to flow of funds (Exhibit 57 and Exhibit 59).

Exhibit 2: On deck next week

Calendar of upcoming events

| | US Data | | | Fed Speaker / Event | Treasury Auction | | | Treasury Settlements | |
|------------|----------------------------------|------------|--------------|---|------------------|---------------|---------|----------------------|--------|
| | Series | BofA | BB Consensus | | Security | Amount (\$bn) | Prior Δ | Security | Amount |
| M, Oct 9 | | | | 8:00 Fed's Barr (voter) speaks at American Bankers' Association Conference 9:00 Fed's Logan (voter) speaks on US outlook, monetary policy 12:50 Fed's Jefferson (voter) speaks at NABE conference | | | | | |
| Tu, Oct 10 | NFIB Small Business Optimism | - | - | 9:00 Fed's Perli speaks at NABE | 13-week bills | 73 | 2 | Bills | 33 |
| | Wholesale Inventories | - | - | 9:30 Fed's Bostic speaks on economic outlook | 26-week bills | 66 | 2 | | |
| | | | | 13:00 Fed's Waller (voter) speaks at monetary policy conference | 43-day bills | 70 | 5 | | |
| | | | | 15:00 Fed's Kashkari (voter) participates in town hall | 3-year notes | 46 | 2 | | |
| W, Oct 11 | | | | 18:00 Fed's Daly speaks at Chicago Council on Global Affairs | | | | | |
| | MBA Mortgage Applications | - | - | 4:15 Fed's Bowman (voter) speaks in Morocco | 9-year 10-month | 35 | 0 | | |
| | Producer Price Index (mom) | 0.20% | 0.30% | 12:15 Fed's Bostic speaks to the Metro Atlanta Chamber | | | | | |
| | PPI Ex Food & Energy (mom) | 0.30% | 0.20% | 14:00 FOMC Meeting Minutes | | | | | |
| Th, Oct 12 | PPI Ex Food, Energy, Trade (mom) | 0.30% | 0.20% | 16:30 Fed's Collins speaks at Wellesley College | | | | | |
| | FOMC Meeting Minutes | | | | | | | | |
| | Initial Jobless Claims | 210k | - | 13:00 Fed's Bostic delivers welcoming remarks | 29-year 10-month | 20 | 0 | Bills | -9 |
| | Consumer Price Index (yoy) | 3.60% | 3.60% | | | | | | |
| | CPI Ex Food & Energy (yoy) | 4.10% | 4.10% | | | | | | |
| F, Oct 13 | Consumer Price Index (mom) | 0.30% | 0.30% | | | | | | |
| | CPI Ex Food & Energy (mom) | 0.20% | 0.30% | | | | | | |
| | Monthly Budget Statement | -\$160.0bn | - | | | | | | |
| | Import Price Index (mom) | 0.80% | 0.60% | | | | | | |
| (mom) | Import Price Index ex Petroleum | -0.10% | - | 9:00 Fed's Harker (voter) speaks on 2023 US economic outlook | | | | | |
| | U. of Michigan Sentiment | 67.5 | 67.5 | | | | | | |

Source: BofA Global Research, Bloomberg, US Treasury

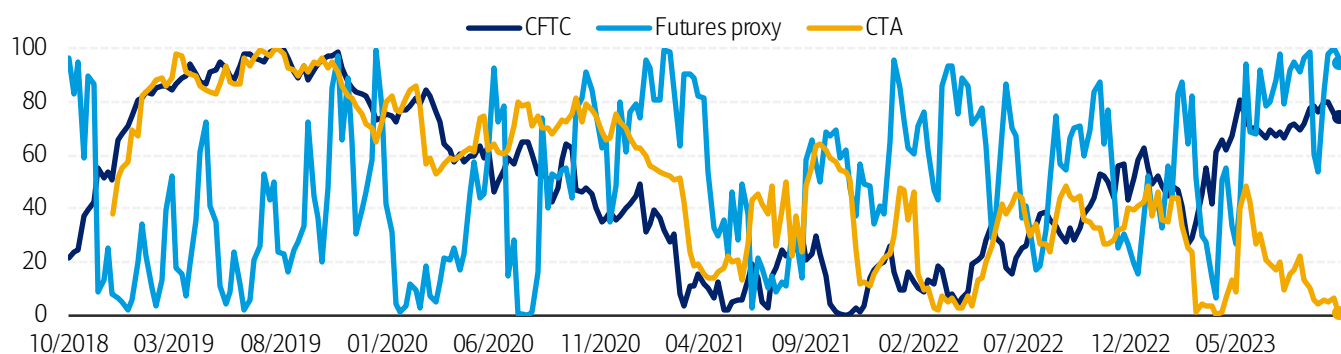
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Positioning indicators



Exhibit 3: 5y percentile of 10 equivalent duration positioning (percentile: higher = longer)

Futures positioning proxy shows less clear bias for rates, CFTC data adjusted for LFs is long, top down CTA model is lagged and shows historic shorts that may have been previously covered

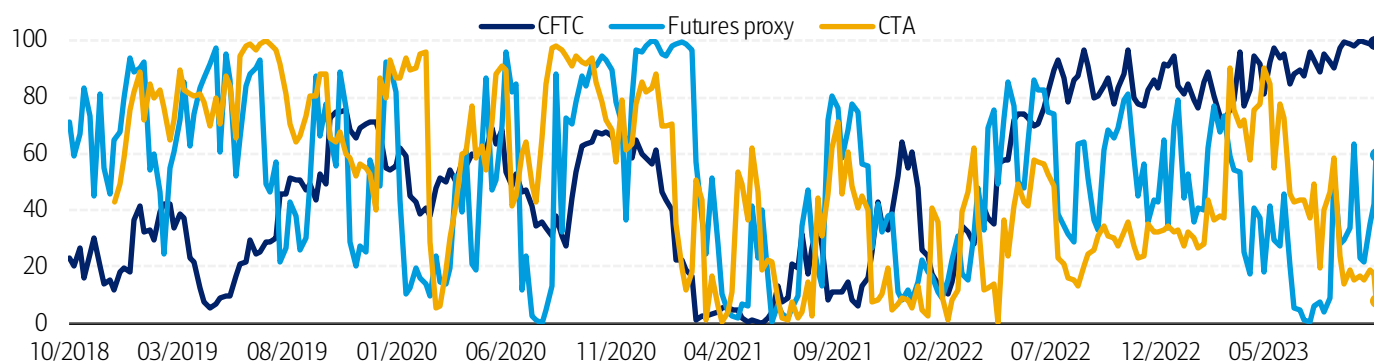


Source: BofA Global Research

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Exhibit 4: 5y percentile of curve positioning (percentile: higher = longer back-end relative to front end)

CTAs are in steeper but futures positioning proxy shows bias for back-end to sell off more, CFTC AMs have longs further out curve

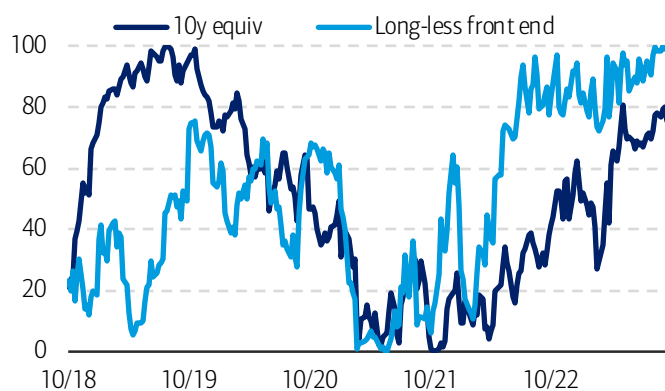


Source: BofA Global Research

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Exhibit 5: 5y percentile of non-commercial ex LF positioning

Positioning is historically long and largely concentrated at the back-end

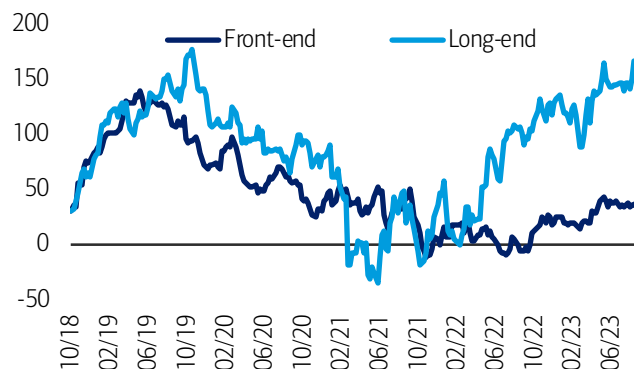


Source: BofA Global Research, Bloomberg

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Exhibit 6: Non-commercial ex leveraged fund positioning (\$bn, 10y equivalent)

Longs are more concentrated in the back-end

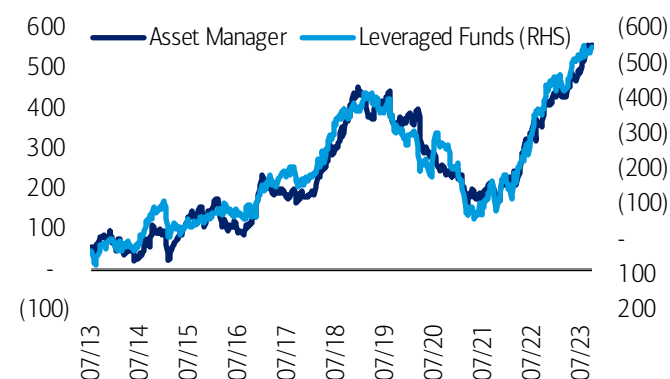


Source: BofA Global Research, Bloomberg

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Exhibit 7: Asset manager and leveraged fund positioning (10y equivalent, \$bn)

Asset manager longs correspond with leveraged fund shorts

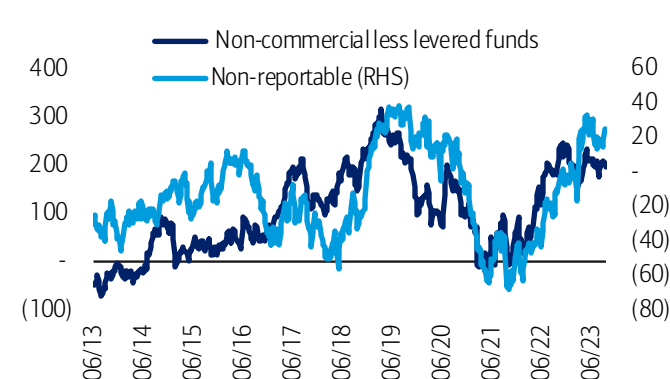


Source: BofA Global Research, Bloomberg

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Exhibit 8: Non-commercial ex LFs and non-reportable positioning (10y equivalent, \$bn)

Directional positions trend together



Source: BofA Global Research, Bloomberg

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Exhibit 9: 10y rate change for given percentile of non-commercial ex-Leveraged fund positioning (higher percentile = longer)

Positioning is a momentum signal: longer positioning is usually followed by stronger 10y performance

| | 0 | 1w | 4w | 8w | 12w | 16w |
|-----------|-----|----|----|----|-----|-----|
| 0 to 10 | 10 | 2 | 1 | 1 | 2 | 3 |
| 10 to 20 | 20 | 1 | 3 | 3 | 2 | 3 |
| 20 to 30 | 30 | 4 | 2 | 1 | 1 | 3 |
| 30 to 40 | 40 | 2 | 4 | 4 | 3 | 3 |
| 40 to 50 | 50 | 0 | 1 | 0 | 1 | 1 |
| 50 to 60 | 60 | 0 | -1 | 0 | 0 | 0 |
| 60 to 70 | 70 | 0 | 0 | 0 | 0 | 0 |
| 70 to 80 | 80 | -4 | -2 | -2 | -3 | -4 |
| 80 to 90 | 90 | 2 | 0 | -1 | -2 | -4 |
| 90 to 100 | 100 | -2 | -2 | -2 | -2 | -2 |

Source: BofA Global Research, Bloomberg, average performance calculated over last 5y

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Exhibit 10: 10y rate change for given percentile of leveraged fund positioning (higher percentile = longer)

Positioning is contrarian signal: shorter positioning is usually followed by stronger 10y performance

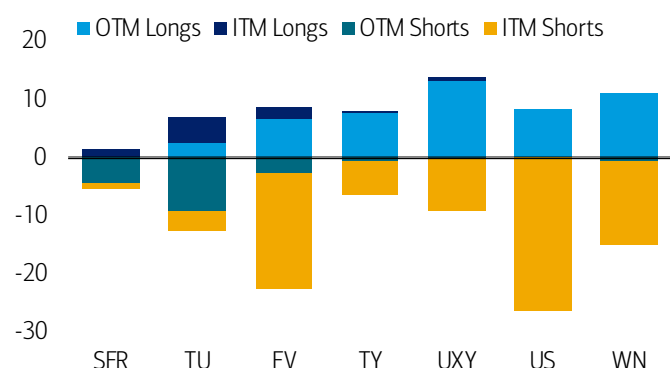
| | 0 | 1w | 4w | 8w | 12w | 16w |
|-----------|-----|----|----|----|-----|-----|
| 0 to 10 | 10 | 4 | 4 | 4 | 4 | 5 |
| 10 to 20 | 20 | -3 | -3 | -1 | -1 | 0 |
| 20 to 30 | 30 | 0 | -3 | -3 | -3 | -5 |
| 30 to 40 | 40 | -5 | -2 | -3 | -3 | -4 |
| 40 to 50 | 50 | -1 | -1 | -1 | -1 | -2 |
| 50 to 60 | 60 | 4 | 3 | 2 | 1 | 1 |
| 60 to 70 | 70 | 1 | 1 | 2 | 2 | 3 |
| 70 to 80 | 80 | 5 | 5 | 4 | 4 | 5 |
| 80 to 90 | 90 | 2 | 4 | 4 | 4 | 5 |
| 90 to 100 | 100 | -1 | -2 | -1 | 0 | 0 |

Source: BofA Global Research, Bloomberg, average performance calculated over last 5y

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Exhibit 11: Proxies for futures positioning

On the week, shorts are ITM except the front-end, longs are largely OTM

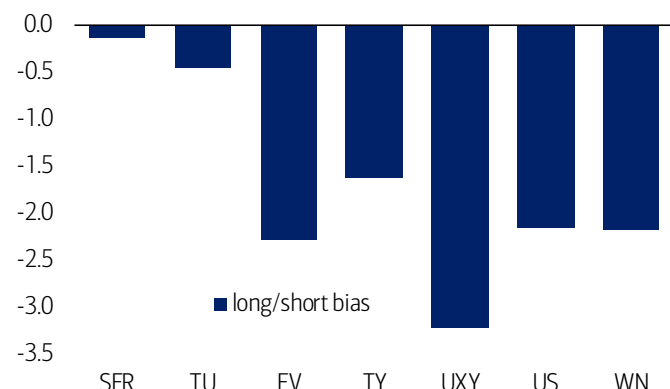


Source: BofA Global Research, Bloomberg

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Exhibit 12: Analysis of proxies for futures positioning

Bias for rates to sell off across the curve, mainly in belly and back-end

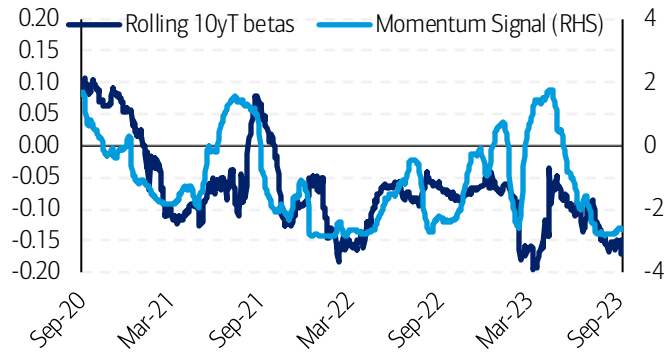


Source: BofA Global Research, Bloomberg, Note: reflects average positioning of futures stack over last 5 days

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Exhibit 13: CTA positioning in 10yT

On the week, drop in momentum signal moderated, CTAs added shorts

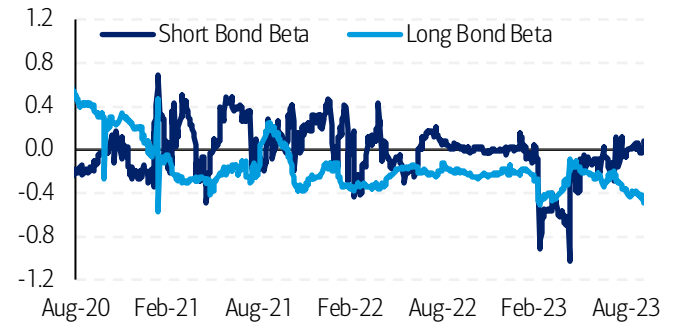


Source: BofA Global Research

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Exhibit 14: CTA positioning in longer duration and shorter duration bonds

Top-down model suggests CTAs are positioned for a steeper curve and are short the back-end

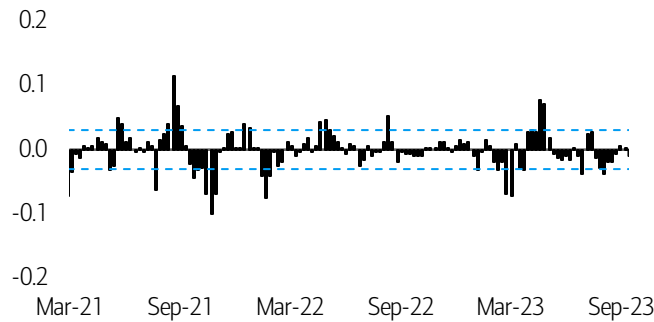


Source: BofA Global Research

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Exhibit 15: Changes in CTA 10yT beta

Change in 10y beta was negative on the week

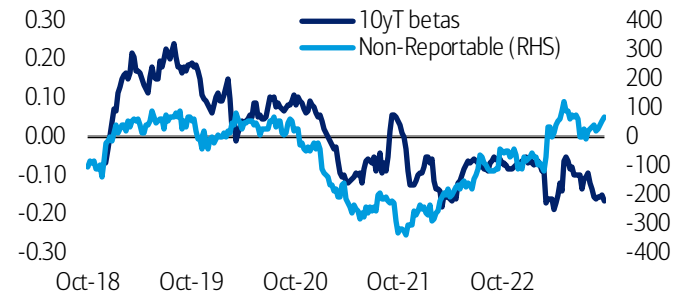


Source: BofA Global Research

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Exhibit 16: CTA 10y TSY beta and non-reportable positions

Strong divergence between non-reportable position and top-down model, which tends to be lagged



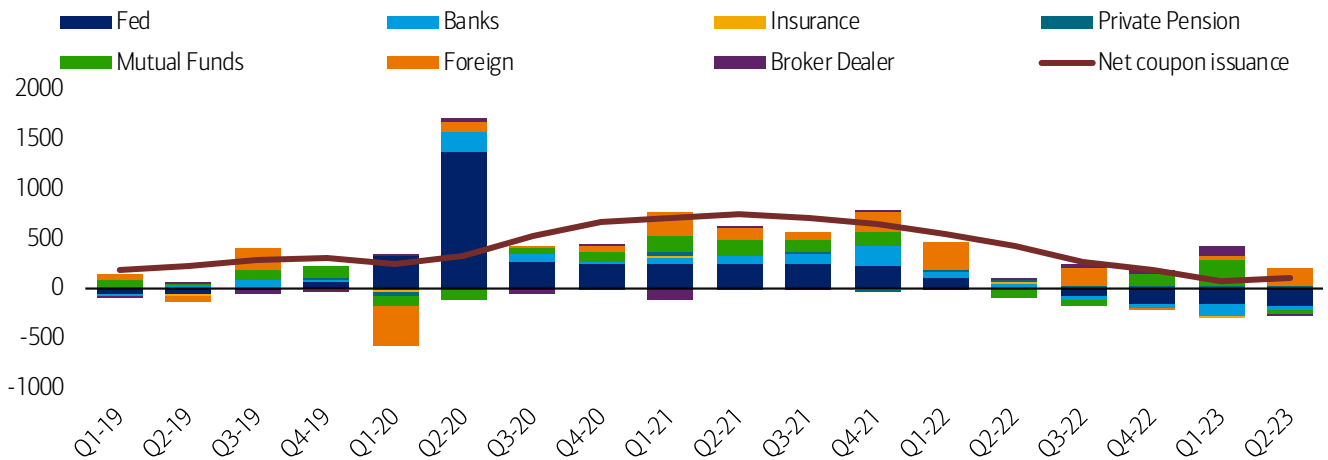
Source: BofA Global Research, Bloomberg

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Flow of funds

Exhibit 17: Changes in large holders of UST securities (\$bn)

In Q2 foreign investors were largest buyers while Fed and banks reduced UST holdings the most

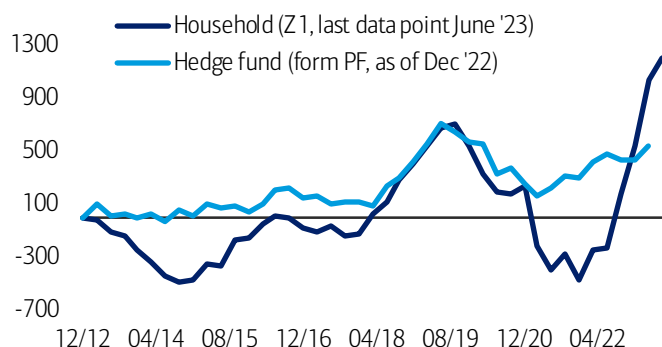


Source: BofA Global Research, Bloomberg. Note: change in levels adjusted for change in rates over the quarter

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Exhibit 18: Change in UST holdings (\$bn)

Hedge funds UST holdings increased last year based on Flow of Funds data and form PF

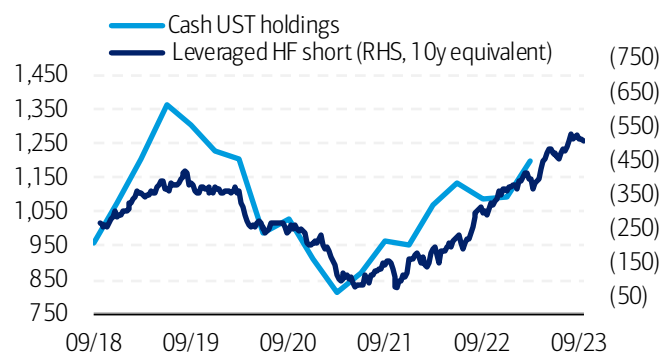


Source: BofA Global Research, Federal Reserve

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Exhibit 19: Hedge fund cash UST holdings vs leveraged fund shorts (\$bn)

Form PF confirms that cash long has grown alongside futures short



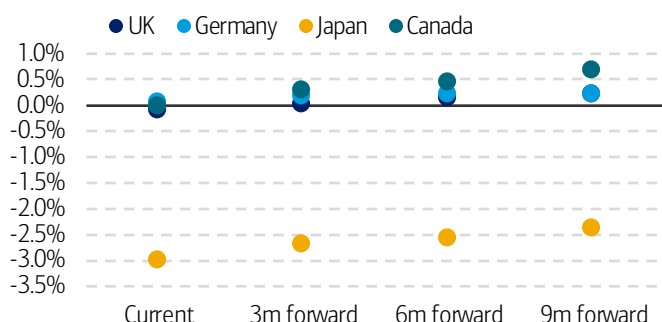
Source: BofA Global Research, Federal Reserve, Bloomberg

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FX hedged pickup and foreign flows

Exhibit 20: FX hedged pickup of TSYs vs local alternatives implied by forwards

Market pricing does not reflect attractive environment for FX hedged carry trades in TSYs currently but forwards suggest improvement



Source: BofA Global Research, Bloomberg. Note: pickup vs 10y local alternative except Japan which is relative to 20y JGB using 3m forward FX hedge

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Exhibit 21: 10Y UST pickup to 20Y JGB, with 3m fx hedge (bps)

10y TSY now offer very negative hedged pickup vs 20y JGBs

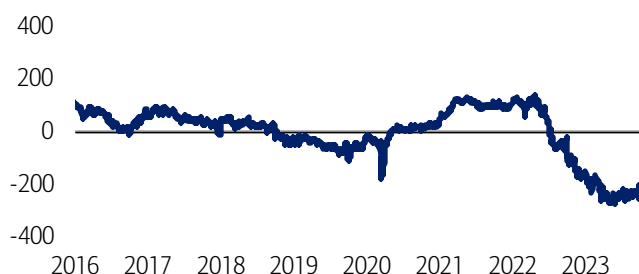


Source: BofA Global Research, Bloomberg

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Exhibit 22: 10Y UST pickup to 10Y JGB, with 3m fx hedge (bps)

10y TSY now offer very negative hedged pickup vs 10y JGBs

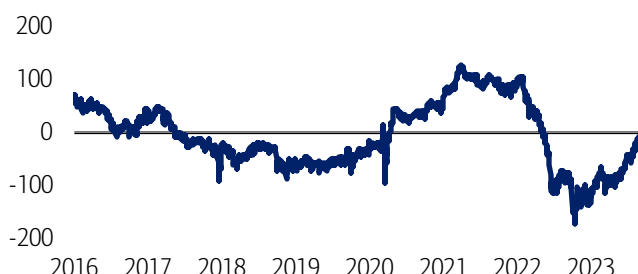


Source: BofA Global Research, Bloomberg

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Exhibit 23: 10Y UST pickup to 10Y Bund, with 3m fx hedge (bps)

10y TSY offers near zero pickup vs 10y Bund

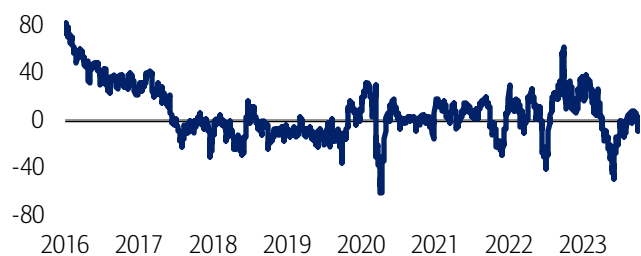


Source: BofA Global Research, Bloomberg

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Exhibit 24: 10Y UST pickup to 10Y CAD govie, with 3m fx hedge (bps)

10y TSY erased previous modest hedged pickup to 10y CAD gov bond

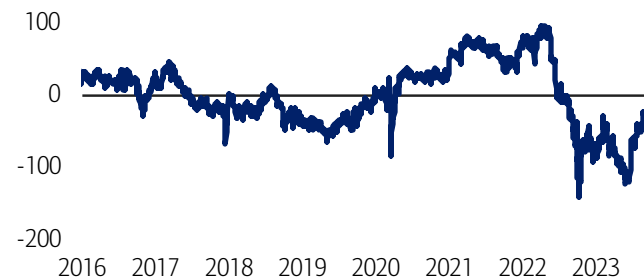


Source: BofA Global Research, Bloomberg

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Exhibit 25: 10Y UST pickup to 10Y Gilt, with 3m fx hedge (bps)

10y TSY offers flat pickup vs gilts



Source: BofA Global Research, Bloomberg

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Exhibit 26: 3m rolling JPY currency hedge

From the perspective of Japanese investor, pickup is negative across all regions

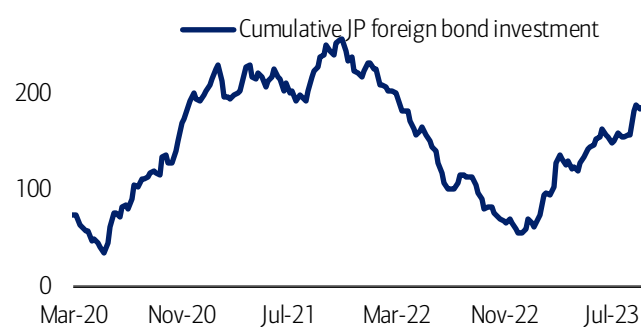
| | 10/5/2023 | | As of 1 wk ago | | As of 1 mo ago | | As of 1 yr ago | |
|---------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Pickup to 10y JGB | Pickup to 20Y JGB | Pickup to 10y JGB | Pickup to 20Y JGB | Pickup to 10y JGB | Pickup to 20Y JGB | Pickup to 10y JGB | Pickup to 20Y JGB |
| 10y UST | -2.22% | -3.01% | -2.44% | -3.16% | -2.24% | -2.98% | -1.18% | -1.89% |
| 10y GER | -2.26% | -3.05% | -2.31% | -3.03% | -2.14% | -2.89% | 0.27% | -0.44% |
| 10y FRA | -1.69% | -2.47% | -1.75% | -2.47% | -1.62% | -2.36% | 0.87% | 0.16% |
| 10y BEL | -1.58% | -2.37% | -1.66% | -2.37% | -1.51% | -2.26% | 0.92% | 0.22% |
| 10y ITA | -0.27% | -1.06% | -0.39% | -1.10% | -0.42% | -1.17% | 2.70% | 1.99% |
| 10y SPA | -1.15% | -1.94% | -1.23% | -1.94% | -1.12% | -1.86% | 1.47% | 0.76% |
| 10y UK | -2.11% | -2.90% | -2.28% | -3.00% | -2.03% | -2.78% | -0.09% | -0.80% |
| 10y CAN | -2.18% | -2.97% | -2.35% | -3.07% | -2.28% | -3.02% | -1.33% | -2.04% |

Source: BofA Global Research, Bloomberg

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Exhibit 27: Japan investment in foreign bonds, cumulative weekly (\$bn)

Long & medium term bonds (\$bn) holdings little changed on the week

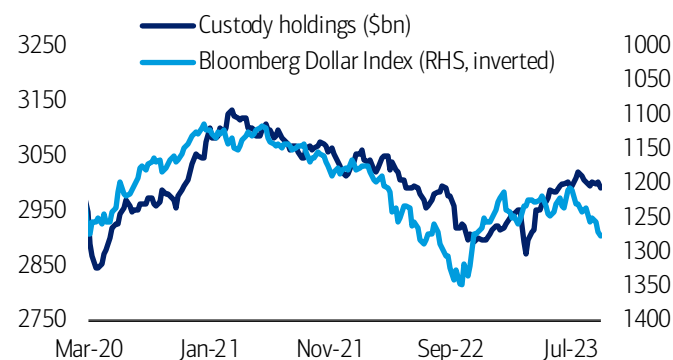


Source: BofA Global Research, Bloomberg

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Exhibit 28: Weekly UST custody holdings, foreign official (\$bn)

Custody holdings dropped on the week

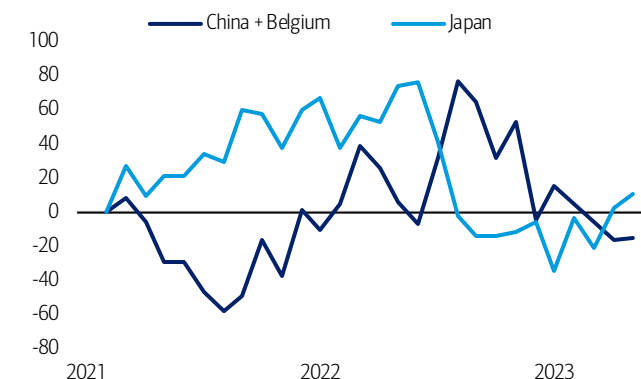


Source: BofA Global Research, NY Fed

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Exhibit 29: Cumulative UST flows from foreign investors (\$bn)

China + Belgium and Japan have turned to net sellers since end of '22, Japan now a net buyer of UST

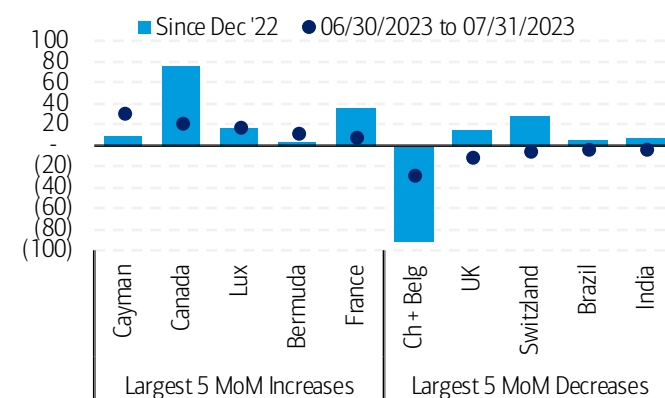


Source: BofA Global Research, Bloomberg, TIC, note: references the valuation-adjusted flow

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Exhibit 30: Largest MoM changes in foreign TSY holdings (\$bn)

Cayman was largest buyer, China + Belgium largest seller in July

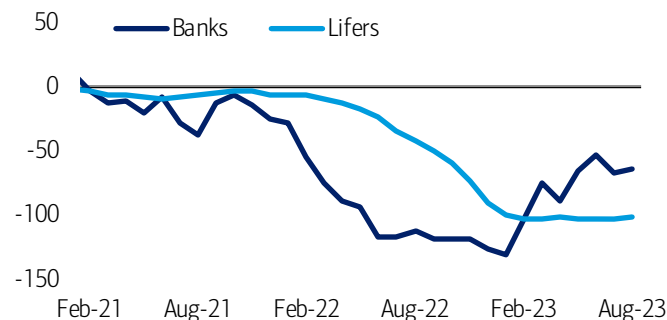


Source: BofA Global Research, TIC, Note: adjusted for level of rates

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Exhibit 31: Cumulative change in Japanese investor foreign bond holdings (\$bn)

While banks and lifers have reduced foreign bond holdings in the last year, banks have recently turned modest buyers while lifer demand has been flat

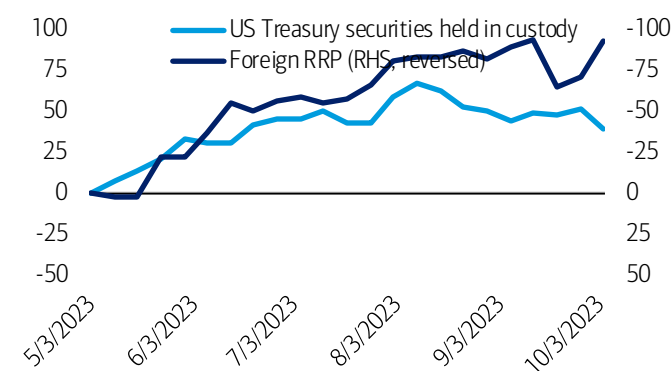


Source: BofA Global Research, Bloomberg. Note: JPY flow converted to USD using end of month FX level, last data point is June '23

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Exhibit 32: Cumulative change in custody holdings and foreign RRP since May 2023 (\$bn)

Increase in custody holdings has been offset by decline in foreign RRP



Source: BofA Global Research, Federal Reserve, Bloomberg

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Fund flows and returns

Exhibit 33: US fixed income fund flows (\$million)

US FI funds saw outflows on the week, primarily led by corp IG & HY funds, inflows seen in mixed allocation, govt short & long funds

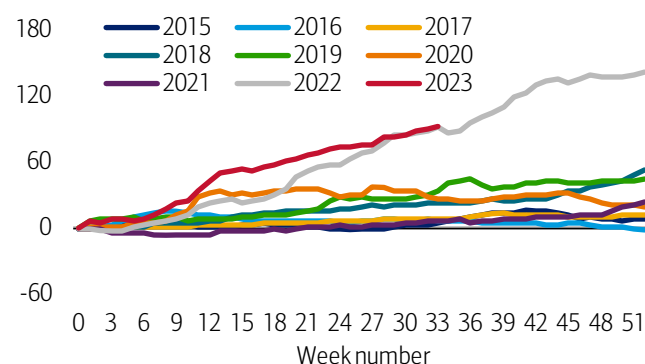
| | 10/4/2023 | Rolling 4w average | Rolling 8w average | Rolling 12w average | Rolling 52w average |
|-------------------|-----------|--------------------|--------------------|---------------------|---------------------|
| Gov: short | 2,612 | 1,679 | 1,687 | 1,329 | 1,072 |
| Gov: intermediate | 1,216 | 468 | 462 | 305 | 338 |
| Gov: long | 889 | 898 | 844 | 945 | 1,164 |
| Corp: IG | (382) | (795) | (838) | (234) | 273 |
| Corp: HY | (2,416) | (1,164) | (651) | (461) | (108) |
| Corp: all quality | 84 | 51 | 40 | 50 | 26 |
| MBS | (226) | 157 | 107 | 220 | 221 |
| Inflation | (66) | (313) | (394) | (240) | (470) |
| Muni | (732) | (618) | (402) | (95) | (215) |
| Mixed allocation | 1,875 | 1,662 | 1,596 | 1,510 | 1,317 |
| All USFI | 2,368 | 1,903 | 2,509 | 3,268 | 3,111 |

Source: BofA Global Research, EPFR

BofA GLOBAL RESEARCH

Exhibit 34: Sovereign fund inflows by year (\$bn)

Flows YTD are on track with highs of last year

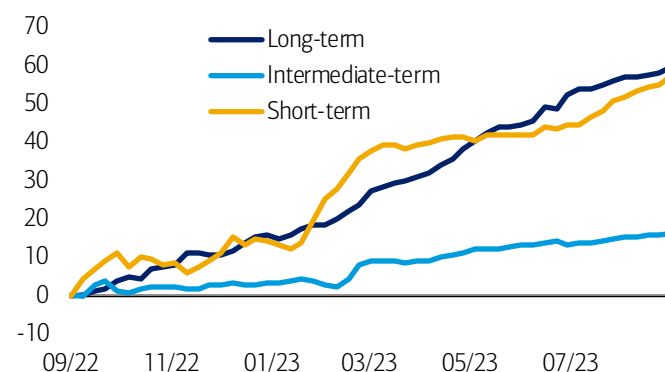


Source: BofA Global Research, EPFR

BofA GLOBAL RESEARCH

Exhibit 35: Sovereign inflows by tenor (\$bn)

Inflows have been concentrated in long-term and short-term funds

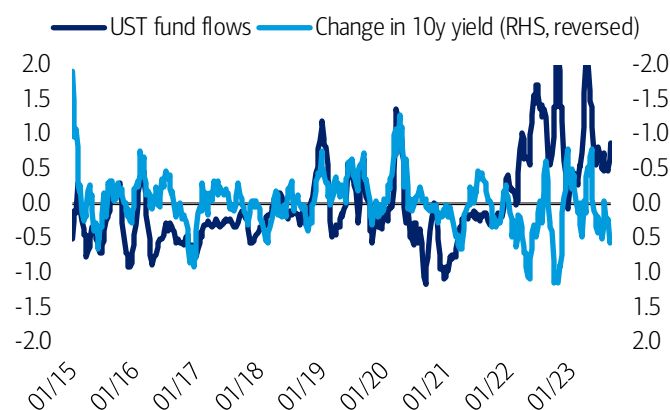


Source: BofA Global Research, EPFR

BofA GLOBAL RESEARCH

Exhibit 36: Fund flows and rate change (Z-score)

Fund flows recently have been historically strong alongside rates rally

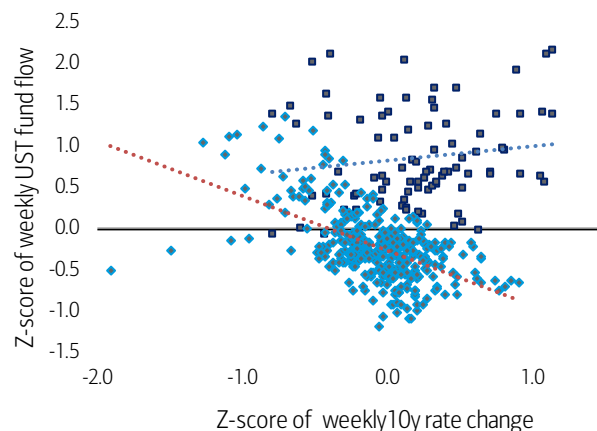


Source: BofA Global Research, EPFR

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Exhibit 37: Fund flows and rate change (Z-score)

Since start of '22, fund flows are less negatively correlated to change in rates



Source: BofA Global Research, EPFR, Bloomberg, Note: dark = post '22, light = '15-'22

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Exhibit 38: Total return FI fund performance vs benchmark

Over the last week, AUM weighted fund performance was below benchmark

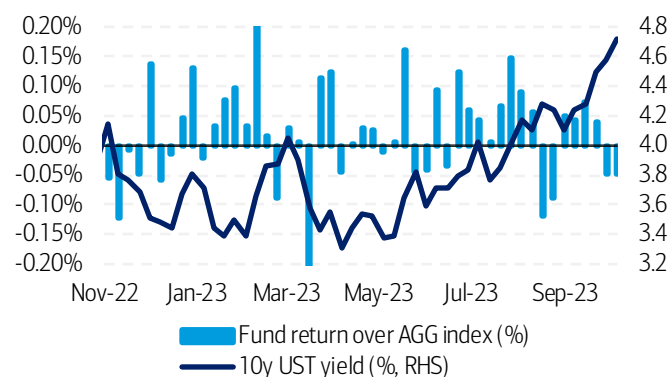
| | AUM (\$Bn) | 10/5/2023 | Vs. Agg | Last 4w | Vs. Agg |
|---|---------------|-----------|---------|---------|---------|
| Vanguard Total Bond Market II Index Fund | 250 | -0.82% | -0.01% | -2.45% | 0.01% |
| Vanguard Total Bond Market Index Fund | 197 | -0.81% | 0.00% | -2.43% | 0.04% |
| PIMCO Income fund | 127 | -0.76% | 0.05% | -1.84% | 0.62% |
| The Bond Fund of America | 74 | -0.75% | 0.06% | -2.41% | 0.06% |
| MetWest Total Return Bond Fund | 58 | -1.09% | -0.28% | -2.97% | -0.51% |
| PIMCO Total Return Fund | 52 | -1.01% | -0.20% | -2.67% | -0.20% |
| Dodge & Cox Income Fund | 58 | -1.01% | -0.20% | -2.57% | -0.10% |
| PGIM Total Return Bond Fund | 41 | -0.89% | -0.08% | -2.59% | -0.12% |
| BlackRock Strategic Income Opportunities Fund | 34 | -0.25% | 0.56% | -0.97% | 1.50% |
| Baird Aggregate Bond Fund | 39 | -0.86% | -0.05% | -2.56% | -0.09% |
| JPMorgan Core Bond Fund | 39 | -0.82% | -0.01% | -2.32% | 0.15% |
| DoubleLine Total Return Bond Fund | 32 | -0.90% | -0.09% | -2.63% | -0.17% |
| Fidelity Series Investment Grade Bond Fund | 33 | -0.86% | -0.05% | -2.56% | -0.09% |
| Fidelity Total Bond Fund | 31 | -1.01% | -0.20% | -2.59% | -0.12% |
| Western Asset Core Plus Bond Portfolio | 22 | -1.39% | -0.58% | -4.16% | -1.69% |
| Baird Core Plus Bond Fund | 24 | -0.94% | -0.13% | -2.36% | 0.11% |
| John Hancock Bond Fund | 22 | -1.08% | -0.27% | -2.87% | -0.40% |
| TIAA-CREF Bond Index Fund | 21 | -0.81% | 0.00% | -2.45% | 0.02% |
| BlackRock Total Return Fund | 17 | -0.98% | -0.17% | -2.77% | -0.30% |
| JPMorgan Core Plus Bond Fund | 16 | -0.87% | -0.06% | -2.53% | -0.06% |
| Bridge Builder Core Bond Fund | 16 | -0.85% | -0.04% | -2.45% | 0.02% |
| T Rowe Price New Income Fund | 16 | -0.83% | -0.02% | -2.25% | 0.22% |
| Western Asset Core Bond Fund | 14 | -1.22% | -0.41% | -3.48% | -1.01% |
| CREF Bond Market Account | 10 | -0.88% | -0.07% | -2.41% | 0.06% |
| Fidelity Investment Grade Bond Fund | 8 | -0.80% | 0.01% | -2.58% | -0.11% |
| DoubleLine Core Fixed Income Fund | 7 | -0.82% | -0.01% | -2.46% | 0.01% |
| TCW Total Return Bond Fund | 3 | -1.15% | -0.34% | -3.54% | -1.07% |
| Janus Henderson Flexible Bond Fund | 3 | -0.92% | -0.11% | -2.73% | -0.26% |
| Weighted avg | 1265 | -0.86% | -0.05% | -2.45% | 0.02% |
| Agg | | -0.81% | | -2.47% | |
| 10y return | | -1.44% | | -4.74% | |

Source: BofA Global Research, Bloomberg, Note: Excess returns are fund total returns over Bloomberg Barclays Agg Index

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Exhibit 39: Total return funds, excess return vs. 10y rate

Weekly asset-weighted total returns for total return funds. Funds return underperformed benchmark on the week

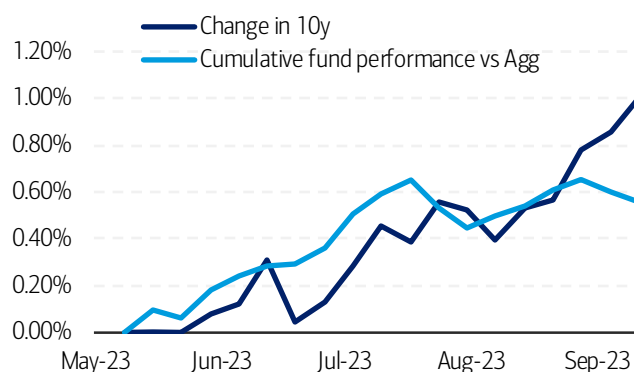


Source: BofA Global Research, Bloomberg. Note: Excess returns are fund total returns over Bloomberg Barclays Agg index

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Exhibit 40: Cumulative return of TR FI funds over benchmark vs 10yT

Funds have modestly outperformed since start of the year



Source: BofA Global Research, Bloomberg. Note: Excess returns are fund total returns over Bloomberg Barclays Agg index

BofA GLOBAL RESEARCH

Exhibit 41: Total return funds' published UST allocations vs benchmark from Q1 and Q2 '23

Funds moderated underweight UST position from Q1 to Q2

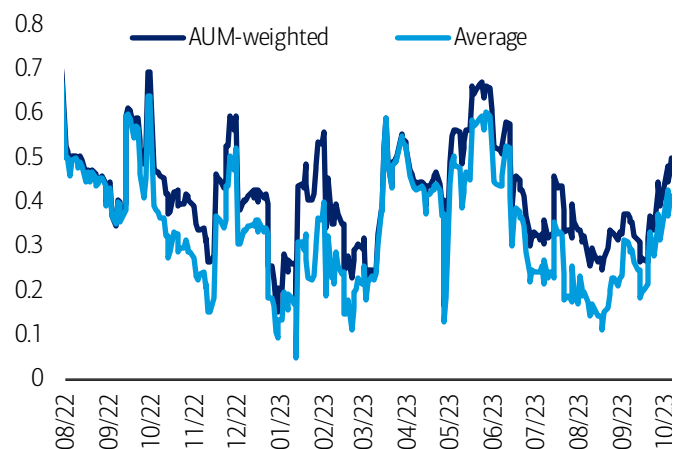
| | | AUM (\$bn) | Q1 '23 (%) | Q2 '23 (%) | Change (PPTS) |
|---------------------|---|---------------|------------|------------|------------------|
| VTBIX | Vanguard Total Bond Market II Index Fund | 255.0 | 2.4 | 2.1 | -0.3 |
| VBMFX | Vanguard Total Bond Market Index Fund | 201.9 | 1.7 | 1.4 | -0.3 |
| PIMIX | PIMCO Income fund | 127.4 | -43.4 | -34.1 | 9.3 |
| ABNDX | The Bond Fund of America | 73.7 | -11.3 | -14.0 | -2.7 |
| MWTIX | MetWest Total Return Bond Fund | 58.4 | -16.5 | -18.7 | -2.2 |
| DODIX | Dodge & Cox Income Fund | 57.7 | -28.1 | -32.7 | -4.6 |
| PTTRX | PIMCO Total Return Fund | 52.5 | -15.4 | -18.6 | -3.2 |
| PDBAX | PGIM Total Return Bond Fund | 40.6 | -33.7 | -34.2 | -0.5 |
| BAGIX | Baird Aggregate Bond Fund | 39.1 | -16.9 | -17.7 | -0.8 |
| PGBOX | JPMorgan Core Bond Fund | 38.8 | -5.0 | -2.2 | 2.8 |
| BSIIX | BlackRock Strategic Income Opportunities Fund | 34.5 | -17.3 | -23.4 | -6.1 |
| FSIGX | Fidelity Series Investment Grade Bond Fund | 33.3 | -7.5 | -10.1 | -2.6 |
| DBLTX | DoubleLine Total Return Bond Fund | 31.5 | -32.7 | -32.8 | -0.1 |
| FTBFX | Fidelity Total Bond Fund | 31.2 | -12.0 | -12.5 | -0.4 |
| BCOIX | Baird Core Plus Bond Fund | 24.2 | -18.5 | -18.4 | 0.1 |
| WACPX | Western Asset Core Plus Bond Portfolio | 22.2 | -33.7 | -38.0 | -4.3 |
| JHBI | John Hancock Bond Fund | 21.6 | -22.8 | -22.5 | 0.3 |
| TBIIX | TIAA-CREF Bond Index Fund | 20.9 | 0.8 | 0.3 | -0.5 |
| MAHQX | BlackRock Total Return Fund | 17.3 | -13.7 | 88.0 | 101.7 |
| ONIA | JPMorgan Core Plus Bond Fund | 16.4 | -5.1 | -2.9 | 2.2 |
| BBTBX | Bridge Builder Core Bond Fund | 15.9 | -22.1 | -23.0 | -0.9 |
| PRCIX | T Rowe Price New Income Fund | 15.8 | -16.2 | -11.8 | 4.4 |
| WATFX | Western Asset Core Bond Fund | 14.0 | -30.7 | -31.1 | -0.4 |
| QCBMIX | CREF Bond Market Account | 10.2 | -21.1 | -22.6 | -1.5 |
| FBNDX | Fidelity Investment Grade Bond Fund | 8.2 | -5.7 | -0.3 | 5.4 |
| DBLFX | DoubleLine Core Fixed Income Fund | 6.6 | -16.9 | -17.9 | -1.0 |
| JFLEX | Janus Henderson Flexible Bond Fund | 2.9 | -11.3 | -17.9 | -6.7 |
| TGLMX | TCW Total Return Bond Fund | 2.6 | -38.5 | -39.6 | -1.1 |
| AUM weighted | | 1274.5 | -13.2 | -11.8 | 1.4 |

Source: BofA Global Research, funds' publicly available reports

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Exhibit 42: Rolling 30-day correlation between excess return and change in 10y UST yield

A higher correlation between the two would suggest that when UST yields increase, excess return is higher (more short), recent decline may suggest moderation in short positioning

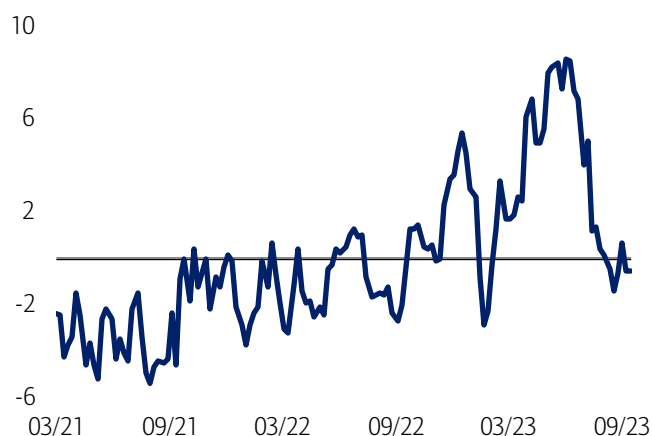


Source: BofA Global research, Bloomberg

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Exhibit 43: Primary dealer 2-6y holdings of TIPS (\$bn)

Primary dealer holdings have modestly recovered from the decline since end of June



Source: BofA Global research, Note: cumulative change since 2021 reflects adjustment for change in market value

BofA GLOBAL RESEARCH

Bank balance sheets

Exhibit 44: Changes to bank balance sheet assets (\$bn)

Domestic bank balance saw increase driven by cash, securities, loans

| | | Current | 1w change | Rolling 4w avg wkly chg | Rolling 8w avg wkly chg | Rolling 12w avg wkly chg | Rolling 52w avg wkly chg |
|-----------------------------------|---------------------|---------|--------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
| All (\$bn, NSA) | Total Assets | 22831 | 84 | -7 | 4 | 0 | 2 |
| | Cash | 3272 | 35 | -12 | 2 | 2 | 3 |
| | UST & Agency | 1533 | 14 | 5 | 4 | 2 | -3 |
| | MBS | 2537 | -26 | -11 | -4 | -4 | -6 |
| | Loans and Leases | 12208 | 29 | 7 | 6 | 7 | 9 |
| | Other | 3280 | 32 | 4 | -4 | -7 | -2 |
| Large Domestic (\$bn, NSA) | Total Assets | 13310 | 100 | 17 | 14 | -1 | -1 |
| | Cash | 1618 | 90 | 19 | 14 | 5 | 3 |
| | UST & Agency | 1127 | 9 | 5 | 3 | 2 | -2 |
| | MBS | 1927 | -8 | -7 | -1 | -2 | -2 |
| | Loans and Leases | 6750 | 11 | 0 | 1 | 1 | 2 |
| | Other | 1888 | -2 | -1 | -4 | -8 | -2 |
| Small Domestic (\$bn, NSA) | Total Assets | 6526 | 13 | -2 | -1 | 2 | 2 |
| | Cash | 429 | 10 | -2 | -2 | -1 | 0 |
| | UST & Agency | 298 | 11 | 2 | 1 | 1 | -1 |
| | MBS | 582 | -18 | -5 | -3 | -2 | -4 |
| | Loans and leases | 4420 | 8 | 3 | 4 | 5 | 6 |
| | Other | 797 | 3 | 0 | 0 | 0 | 0 |
| All Domestic (\$bn, NSA) | Total Assets | 19837 | 113 | 15 | 13 | 1 | 1 |
| | Cash | 2048 | 100 | 17 | 12 | 4 | 4 |
| | UST & Agency | 1425 | 20 | 7 | 4 | 3 | -3 |
| | MBS | 2509 | -26 | -12 | -5 | -4 | -5 |
| | Loans and leases | 11170 | 18 | 4 | 5 | 6 | 8 |
| | Other | 2685 | 1 | -1 | -4 | -8 | -2 |
| Foreign (\$bn, NSA) | Total Assets | 2994 | -29 | -22 | -9 | -1 | 1 |
| | Cash | 1224 | -65 | -29 | -10 | -2 | -1 |
| | UST & Agency | 108 | -6 | -1 | 0 | -1 | 0 |
| | MBS | 28 | 0 | 1 | 0 | 0 | 0 |
| | Loans and leases | 1038 | 11 | 3 | 2 | 1 | 1 |
| | Other | 595 | 31 | 5 | 0 | 1 | 1 |

Source: BofA Global Research, Federal Reserve, Bloomberg

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Exhibit 45: Select bank balance sheet liabilities (\$bn, NSA)

Liability growth driven by deposits

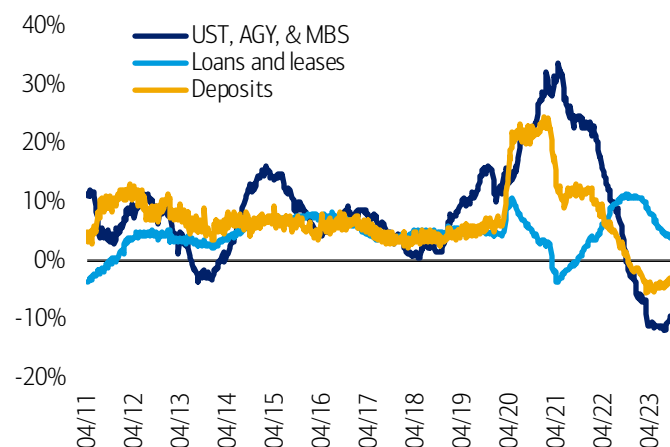
| | | Current | 1w change | Rolling 4w avg wkly chg | Rolling 8w avg wkly chg | Rolling 12w avg wkly chg | Rolling 52w avg wkly chg |
|------------------------------------|----------------|---------|-----------|-------------------------|-------------------------|--------------------------|--------------------------|
| Deposits (\$bn, NSA) | All | 17291 | 53 | 1 | -5 | -5 | -10 |
| | Domestic | 16013 | 64 | 1 | -5 | -7 | -10 |
| | Large Domestic | 10754 | 60 | 2 | -5 | -11 | -8 |
| | Small Domestic | 5259 | 4 | 0 | 0 | 4 | -1 |
| | Foreign | 1278 | -11 | 0 | 0 | 1 | 0 |
| Other borrowing (\$bn, NSA) | All | 2303 | 22 | 7 | 11 | 1 | 11 |
| | Domestic | 1331 | 22 | 9 | 12 | 4 | 9 |
| | Large Domestic | 893 | 19 | 11 | 14 | 7 | 7 |
| | Small Domestic | 438 | 3 | -2 | -2 | -3 | 3 |
| | Foreign | 972 | 1 | -1 | -2 | -3 | 2 |

Source: BofA Global Research, Federal Reserve, Bloomberg

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Exhibit 46: YoY change in securities, loans, and deposits

Securities growth usually only positive when deposit growth is positive

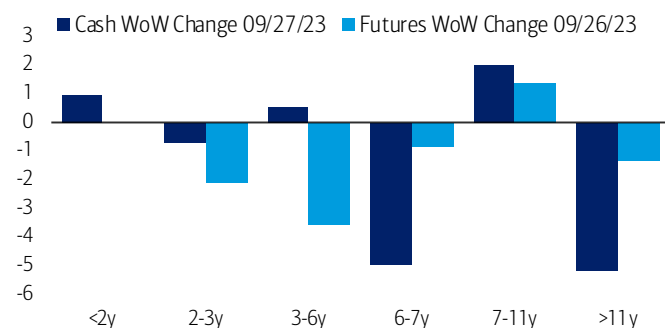


Source: BofA Global Research, Bloomberg, Federal Reserve

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Primary dealer balance sheet**Exhibit 47: Dealers WoW change in positions**

10y equivalent, \$bn, cash positions lower in the belly & back-end

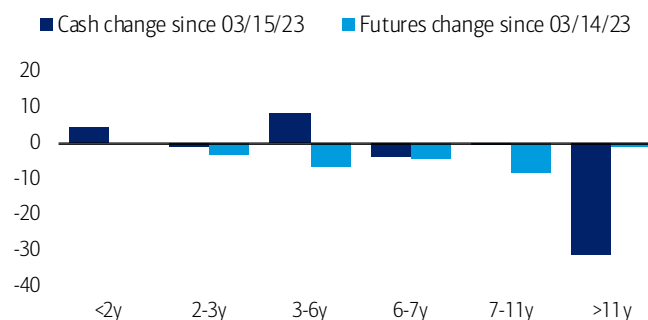


Source: BofA Global Research, NY Fed, CFTC

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Exhibit 48: Dealers change in positions since bank risk events

10y equivalent, \$bn, cash positions lower at back-end

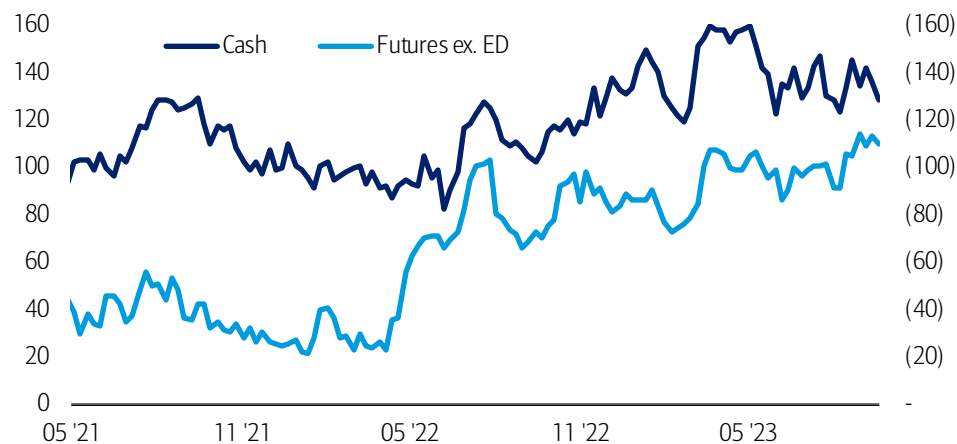


Source: BofA Global Research, NY Fed, CFTC

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Exhibit 49: Dealers total sector positions

10y equivalent, \$bn, short futures & long cash dropped on the week



Source: BofA Global Research, NY Fed, CFTC

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Auction statistics**Exhibit 50: Auction summary statistics**

Z-score calculated on levels, Investment fund participation in auctions remains robust

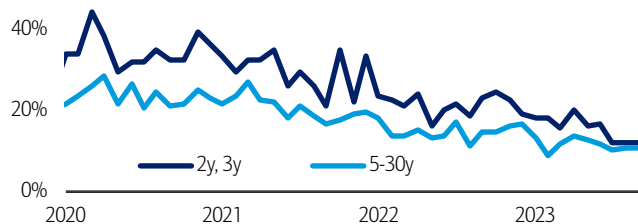
| | | Primary Dealer | Indirect Bidder | Direct Bidder | Investment Fund | Foreign | Depository Institution |
|-----|------------|----------------|-----------------|---------------|-----------------|---------|------------------------|
| 2y | 8/31/2023 | 13.3% | 68.5% | 18.2% | 69.9% | 12.4% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | -0.1% | -1.2% | -0.1% |
| | 1Y Z-score | -1.3 | 1.1 | -0.7 | 1.3 | -0.9 | -0.5 |
| 3y | 9/15/2023 | 10.8% | 69.4% | 19.8% | 63.5% | 13.5% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | -7.7% | -3.1% | 0.0% |
| | 1Y Z-score | -1.3 | 0.9 | 0.2 | -0.1 | -0.7 | -0.3 |
| 5y | 8/31/2023 | 12.2% | 19.7% | 68.1% | 74.9% | 10.0% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | 4.0% | -3.5% | -0.1% |
| | 1Y Z-score | -0.5 | 1.1 | 0.1 | 1.3 | -1.2 | -0.6 |
| 7y | 8/31/2023 | 8.1% | 75.3% | 16.6% | 80.7% | 8.3% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | 12.2% | -6.7% | 0.0% |
| | 1Y Z-score | -0.9 | 1.0 | -0.7 | 1.5 | -1.3 | -0.5 |
| 10y | 9/15/2023 | 12.4% | 67.7% | 19.9% | 67.6% | 16.2% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | -1.5% | -1.4% | 0.0% |
| | 1Y Z-score | -0.7 | 0.5 | 0.3 | 0.3 | 0.2 | -0.6 |
| 20y | 8/31/2023 | 9.6% | 68.8% | 21.7% | 75.5% | 10.4% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | -0.5% | -1.9% | 0.0% |
| | 1Y Z-score | -0.3 | -0.6 | 1.5 | 0.7 | -0.9 | #DIV/0! |
| 30y | 9/15/2023 | 10.9% | 69.0% | 20.1% | 66.8% | 14.9% | 0.0% |
| | MoM Change | 0.0% | 0.0% | 0.0% | -2.7% | -0.5% | 0.0% |
| | 1Y Z-score | -0.1 | -0.2 | 0.5 | -0.8 | 0.3 | -0.7 |

Source: BofA Global Research, Treasury

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Exhibit 51: Primary dealer – average auction allotment

Dealer participation has declined

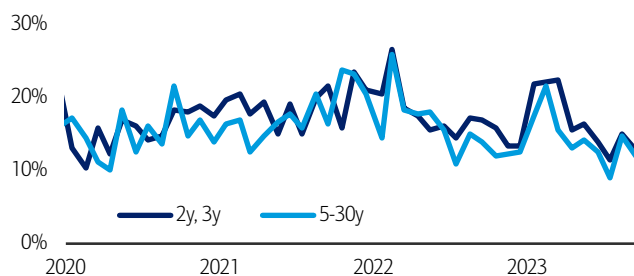


Source: BofA Global Research, Treasury

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Exhibit 53: Foreign investment – average auction allotment

Foreign participation still below average despite modest uptick in recent weeks

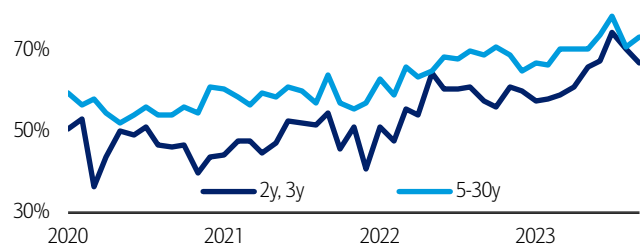


Source: BofA Global Research, Treasury

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Exhibit 52: Investment fund – average auction allotment

Fund participation still elevated

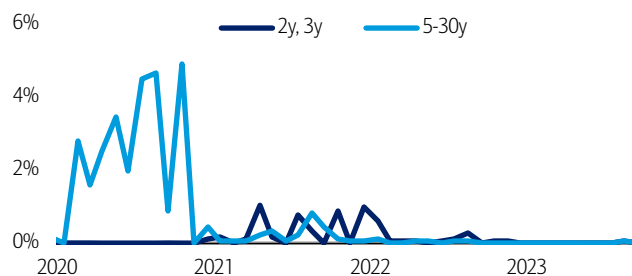


Source: BofA Global Research, Treasury

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Exhibit 54: Depository institutions – average auction allotment

Participation is minimal



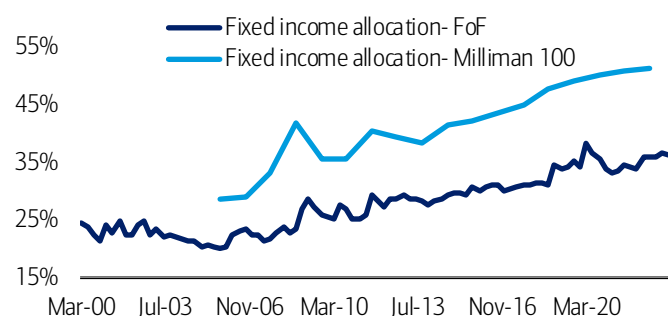
Source: BofA Global Research, Treasury

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Pensions

Exhibit 55: DB private pension fixed income allocation from Flow of Funds and smaller Milliman subset

Milliman funds have shown more de-risking than broader private DB pension funds according to FoF

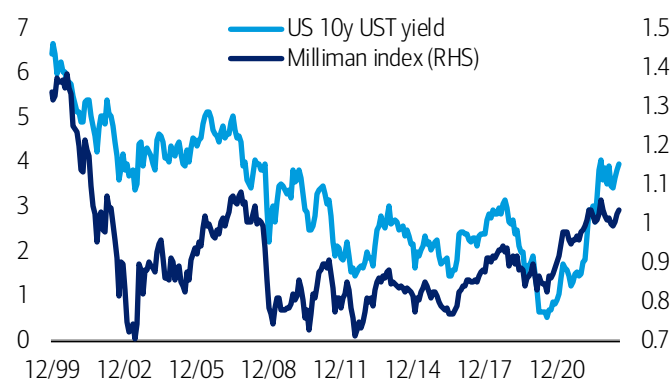


Source: BofA Global Research, Milliman, Federal Reserve

BofA GLOBAL RESEARCH

Exhibit 56: 10y UST yield and Milliman pension funded index

Funded status historically improves with an increase in interest rates

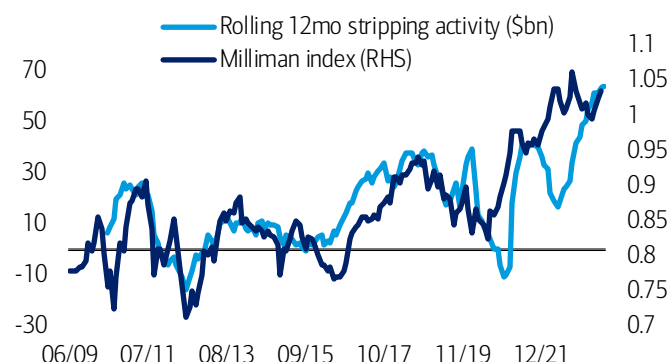


Source: BofA Global Research, Bloomberg

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Exhibit 57: Milliman index and 12mo increase in USTs held in stripped form

Higher pension funded status aligns with higher stripping activity

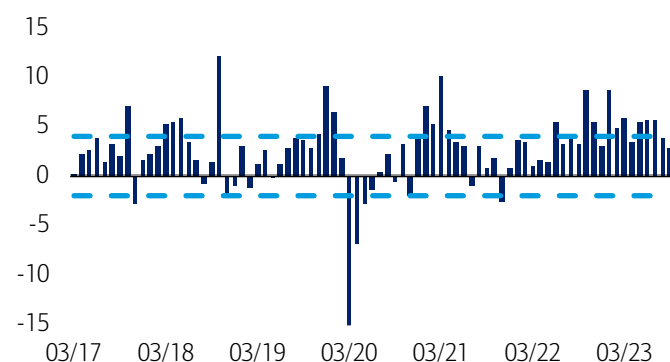


Source: BofA Global Research, Bloomberg

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Exhibit 58: Change in USTs held in stripped form (\$bn)

Stripping activity cooled modestly in August

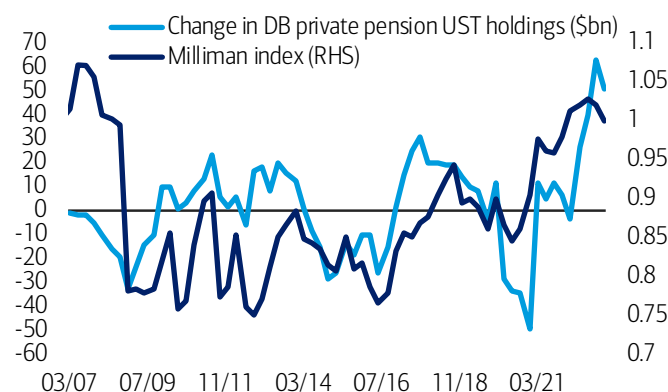


Source: BofA Global Research, Note: dashed line is 1stddev

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Exhibit 59: UST holdings of private DB pensions and funded status

When funded status is higher, pension funds buy more USTs



Source: BofA Global Research, Bloomberg, Federal Reserve

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