

US Rates Watch

Vol views – At the edge of a regime shift?

At the edge of a regime shift in rates?

10yT yields at 3.11% are approaching levels (c.3.10-3.25%) that are consistent with a reset of ranges (see Exhibit 1). However, the recent selloff is uncharacteristic of the typical late-cycle dynamics that generally favors a duration overweight (see [10yT at edge of regime shift as market enters late-cycle dynamics](#)).

The most-significant risk that seems to be expressed in the recent bearish dynamics (and idiosyncrasy vs the recent cycles) is that of a change of regime on longer term (LT) inflation that drives a reset of the nominal neutral rate view and rate ranges at the backend of the curve. Indeed, 2s10s curve forwards seem to be pricing a reset of the nominal neutral rate view into the c.3-3.25% range (see Exhibit 2), which clearly reflects a market keen on assigning a higher probability to this regime shift.

The current week will be critical to confirm or start to dispel this view for a regime shift, with the potential for the CPI prints to start showing a much anticipated rolldown on inflation (consensus core CPI around 6% from a 6.5% print for March).

In recent publications we have argued that there are two essential ingredients for the market to start to fade some of the extreme volatility in rates space, and push back against the view for a reset of LT inflation: (1) a buildup of consensus around a downward trajectory for inflation in the quarters ahead, towards the 4-4.5% range for core PCE by year end; and (2) a more clear communication from the Fed around the policy path. The Fed has fueled a significant level of uncertainty as it argued for high levels of optionality around the policy path instead of providing a clear forward guidance to the market (see [Fed fueling uncertainty](#)). The May FOMC meeting creates some hope that we may be shifting the narrative in this context, and indeed the left side of the grid has faded some of the richness recently (see Table 1).

So we are: (1) at the edge for a regime shift higher in rates, (2) against a late-cycle backdrop which generally supports a duration overweight, (3) in a context where inflation may start to show a much anticipated rolldown as base effects take hold, and (4) the Fed is starting to guide the market more clearly around the policy path. It is virtually impossible to square these into a clear view for the outlook.

As we argued in recent publications, higher rate scenarios are a risk well worth hedging in portfolios (we have favored payer ladders at the frontend and steepeners in intermediate expiries). However, we remain unconvinced of the regime shift thesis. Our [recent forecast revisions](#) reflect some persistence of the uncertainty near-term, but our 3.25% target for 10yT by end-'22 continues to push back against the view for a reset in rate ranges. As we moved past the peak in inflation and crystalize the view for the policy path we are likely to move past the peak in vol also, with implieds likely to continue to fade the recent richness gradually.

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ULC – Upper left corner

URC – Upper right corner

LRC – Lower right corner

LRC – Lower right corner

ITM – In the money

OTM – Out of the money

For a list of recent recommendations please see our [Global Rates Weekly](#)

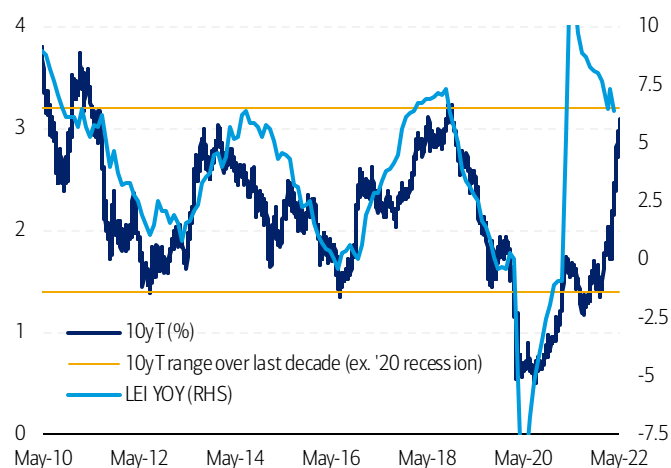
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Exhibit 1: 10yT at the edge of a regime shift as the market enters late-cycle dynamics

The recent selloff uncharacteristic of the typical late-cycle dynamics that generally favor duration

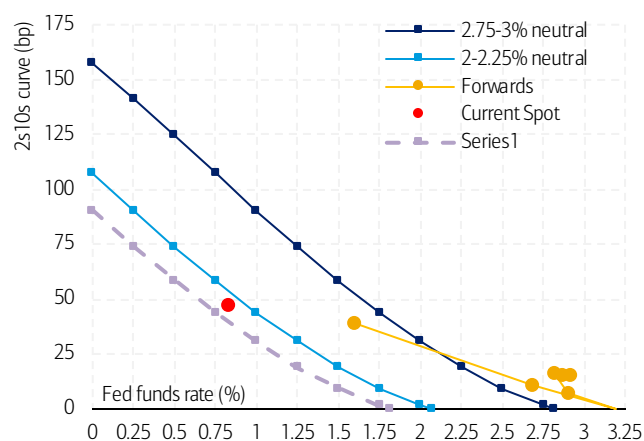


Source: BofA Global Research; The Conference Board; Bloomberg

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Exhibit 2: Expectations for 2s10s bear flattening dynamic vs neutral rate view

Market seems to be keen on pricing a reset of the neutral rate view towards the 3-3.25% range



Source: BofA Global Research

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Levels and Recent Moves

Exhibit 3: ATM Normal Volatility Grid

114.2bp for 1y10y volatility

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	103.5	126.7	128.7	134.5	132.0	124.5	110.8
3M	113.3	130.6	131.2	132.9	130.4	123.0	107.0
6M	123.2	131.7	131.0	128.8	125.9	118.2	102.2
1Y	137.3	137.4	135.2	128.5	121.0	114.2	98.8
2Y	138.1	134.8	131.2	124.5	116.4	109.2	92.8
3Y	132.9	128.4	124.7	117.8	110.6	103.4	87.3
4Y	127.0	122.1	118.0	110.5	104.6	98.2	82.5
5Y	118.4	113.3	110.0	103.9	99.3	93.6	78.2
10Y	87.5	85.4	84.0	81.3	78.8	75.6	63.2
30Y	63.2	61.7	60.6	58.7	56.9	54.6	45.6

Source: BofA Global Research

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Exhibit 4: ATM Volatility Grid - 3m Z-Scores

Grid rich on 3m Z-Scores except for the extreme LLC

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.1	-0.1	0.1	0.7	1.0	1.0	1.0
3M	-0.5	0.3	0.5	1.0	1.4	1.4	1.2
6M	-0.1	0.5	0.6	1.1	1.5	1.5	1.2
1Y	0.4	0.8	0.9	1.3	1.4	1.5	1.3
2Y	0.8	1.0	1.1	1.4	1.5	1.6	1.3
3Y	1.1	1.1	1.2	1.5	1.5	1.6	1.4
4Y	1.4	1.4	1.4	1.5	1.5	1.5	1.3
5Y	1.5	1.4	1.4	1.4	1.4	1.4	1.1
10Y	1.1	1.0	1.0	1.0	1.0	1.0	0.6
30Y	1.1	0.9	1.0	1.0	1.0	1.0	0.5

Source: BofA Global Research

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Table 1: ATM Normal Volatility Grid - CoW

Left side underperformed on the grid since the Fed

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-46.7	-30.9	-25.6	-9.8	-3.5	-2.1	2.0
3M	-35.6	-21.7	-18.1	-7.2	-1.1	0.2	2.0
6M	-26.6	-16.7	-13.7	-4.7	0.5	1.1	2.7
1Y	-17.4	-10.8	-8.6	-1.8	-0.4	0.9	2.5
2Y	-8.9	-5.3	-3.2	0.6	1.0	1.4	1.2
3Y	-3.3	-1.9	-0.7	1.5	1.4	1.3	1.1
4Y	1.6	2.1	1.9	1.4	1.1	0.8	0.7
5Y	2.6	2.5	2.1	1.3	0.9	0.4	-0.2
10Y	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4	-0.7
30Y	0.2	0.2	0.2	0.2	0.1	-0.1	-0.3

Source: BofA Global Research

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Table 2: ATM Straddle Premiums

7.5% straddle premiums for 1y10y

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.23%	0.55%	0.82%	1.39%	1.85%	2.38%	4.92%
3M	0.44%	1.00%	1.48%	2.42%	3.23%	4.15%	8.41%
6M	0.67%	1.42%	2.08%	3.30%	4.38%	5.60%	11.30%
1Y	1.04%	2.05%	2.98%	4.57%	5.84%	7.51%	15.19%
2Y	1.43%	2.76%	3.96%	6.07%	7.70%	9.85%	19.65%
3Y	1.64%	3.13%	4.47%	6.82%	8.69%	11.06%	22.06%
4Y	1.77%	3.33%	4.75%	7.17%	9.22%	11.79%	23.49%
5Y	1.78%	3.35%	4.80%	7.32%	9.49%	12.21%	24.31%
10Y	1.60%	3.08%	4.47%	6.99%	9.20%	12.11%	24.82%
30Y	1.24%	2.41%	3.51%	5.55%	7.40%	9.93%	20.94%

Source: BofA Global Research

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Exhibit 5: 1y10y normal vol

1y10y vol c.114bp

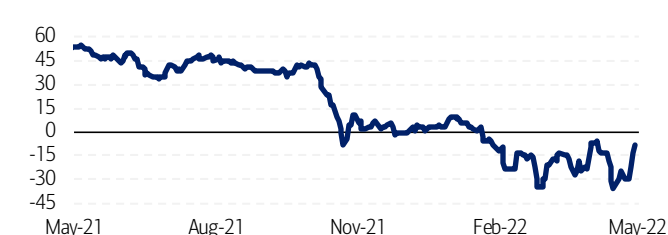


Source: BofA Global Research; Bloomberg

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Exhibit 6: 3m10y vs. 3m2y Normal Volatility

Left side fading some of the richness vs the right side

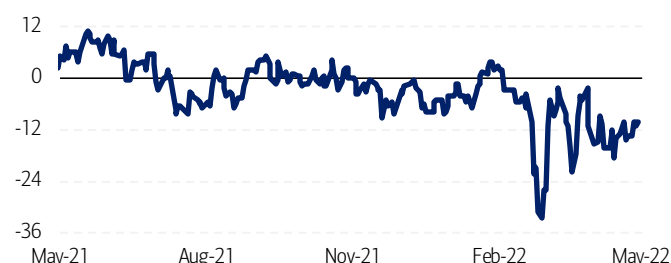


Source: BofA Global Research; Bloomberg

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Exhibit 7: 1y10y vs. 1m10y Normal Volatility

Term structure of vol still inverted, but inversion less extreme



Source: BofA Global Research; Bloomberg

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Exhibit 8: 2s10s curve directionality 44% dictated by frontend

Un-anchoring of frontend since Oct-21



Source: BofA Global Research

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Volatility Grid Relative Value

PCA Z-SCORES

Table 3: 3m Z-Scores w/ PCA framework

Some cheapness on left side and 30y tails on 3m Z-Scores

	1y	2y	3y	5y	7y	10y	30y
3m	-1.0	2.1	0.9	0.7	3.2	1.8	-3.7
6m	-2.4	-0.3	0.2	1.1	4.3	2.5	-3.6
1y	-2.6	-1.3	-1.2	1.6	2.3	0.9	-3.0
2y	-3.1	-3.7	-2.2	2.4	2.2	0.9	-2.2
5y	2.0	1.5	2.0	1.6	0.8	0.4	0.6
10y	-0.8	-1.7	-1.8	-1.6	-1.5	0.2	-0.6

Source: BofA Global Research

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Table 5: 6m Z-Scores w/ PCA framework

Some cheapness on left side and 30y tails on 6m Z-Scores

	1y	2y	3y	5y	7y	10y	30y
3m	0.9	0.6	0.3	0.6	2.0	2.9	-3.7
6m	-0.7	-0.4	-0.9	0.3	3.4	2.0	-2.4
1y	-2.1	-1.3	-1.1	1.6	2.6	2.0	-0.5
2y	-3.4	-3.9	-2.3	2.7	2.5	2.2	-0.2
5y	1.7	1.1	1.3	1.6	1.0	0.5	-0.6
10y	-0.6	-1.8	-1.7	-1.2	0.8	0.5	-0.5

Source: BofA Global Research

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Table 7: 1y Z-Scores w/ PCA framework

Some cheapness on left side and 30y tails on 1y Z-Scores

	1y	2y	3y	5y	7y	10y	30y
3m	-1.9	-2.0	0.3	1.4	2.2	1.7	-0.1
6m	-1.6	1.2	0.2	1.4	3.1	2.3	-0.5
1y	0.0	1.0	0.8	2.3	3.5	2.3	-0.9
2y	-0.1	-0.1	0.5	2.1	2.0	1.1	-1.6
5y	0.5	0.0	-0.4	-1.1	-1.8	-2.4	-3.2
10y	-3.0	-3.7	-3.7	-3.5	-3.5	-3.4	-3.3

Source: BofA Global Research

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Table 9: 3m Z-Scores w/ modified PCA framework...

Granular approach shows richness virtually across the grid...

	1y	2y	3y	5y	7y	10y	30y
1m	1.0	0.8	0.8	0.6	1.0	2.0	1.5
3m	1.9	2.4	0.8	0.8	1.2	1.6	1.6
6m	1.8	2.2	1.8	0.7	1.1	1.4	1.3
1y	1.7	2.1	2.4	2.8	3.8	2.1	1.5
2y	1.9	2.0	2.5	2.9	3.0	3.4	2.2
3y	2.4	1.6	1.1	2.0	1.7	1.8	2.0
4y	1.7	0.6	0.4	0.9	1.0	1.6	1.8
5y	1.9	3.0	0.2	0.8	0.8	1.1	1.4
10y	1.7	2.0	2.1	0.7	-0.6	0.1	0.1
15y	1.4	1.8	1.5	2.2	2.4	0.3	0.4
30y	1.1	1.2	0.7	1.5	1.7	1.4	-1.1

Source: BofA Global Research

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Table 4: 3m Z-Scores w/ PCA framework w/o rates directionality

Grid broadly rich when directionality take into account

	1y	2y	3y	5y	7y	10y	30y
3m	-0.6	0.0	0.0	0.4	1.0	0.9	-0.2
6m	-0.7	-0.1	0.1	0.8	1.2	1.0	-0.3
1y	-0.6	0.2	0.3	1.3	1.5	1.0	-0.3
2y	0.0	0.4	0.8	1.8	1.9	1.3	-0.1
5y	1.9	1.7	1.7	1.5	1.2	0.9	0.6
10y	0.3	-0.1	-0.1	0.1	0.0	0.4	-0.2

Source: BofA Global Research

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Table 6: 6m Z-Scores w/ PCA framework w/o rates directionality

Grid broadly rich when directionality take into account

	1y	2y	3y	5y	7y	10y	30y
3m	-0.2	0.1	0.2	0.7	1.4	1.1	0.0
6m	-0.3	0.1	0.1	0.7	1.6	1.5	-0.1
1y	-0.5	0.2	0.4	1.2	1.4	1.5	0.4
2y	-0.3	0.0	0.5	1.6	1.7	1.8	0.5
5y	1.5	1.3	1.3	1.3	1.2	1.0	0.2
10y	0.5	-0.1	0.0	0.2	0.9	0.7	-0.1

Source: BofA Global Research

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Table 8: 1y Z-Scores w/ PCA framework w/o rates directionality

Left side cheap on 1y history when directionality take into account

	1y	2y	3y	5y	7y	10y	30y
3m	-2.4	-1.2	-1.4	-0.9	-0.2	-0.2	-0.7
6m	-2.3	-1.4	-1.7	-1.1	-0.3	-0.4	-1.0
1y	-2.0	-1.5	-1.6	-0.9	-0.7	-0.6	-1.2
2y	-1.9	-1.8	-1.5	-0.7	-0.7	-0.7	-1.5
5y	-1.0	-1.1	-1.2	-1.4	-1.6	-1.8	-2.2
10y	-2.1	-2.3	-2.3	-2.3	-2.3	-2.3	-2.5

Source: BofA Global Research

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Table 10: ...and w/o directionality with rates

... persisting as directionality with rates is removed

	1y	2y	3y	5y	7y	10y	30y
1m	0.9	0.9	1.0	1.3	1.0	1.9	1.5
3m	2.0	2.4	0.9	0.4	1.2	1.7	1.6
6m	1.7	2.1	2.0	0.9	1.3	1.2	1.6
1y	1.6	2.0	2.4	2.9	4.0	2.2	1.8
2y	1.9	2.0	2.3	2.7	3.1	3.4	2.4
3y	2.5	1.6	1.1	1.7	1.4	1.7	2.2
4y	1.8	0.7	0.8	1.5	1.0	1.5	1.7
5y	1.9	3.3	0.5	0.9	0.7	1.1	1.2
10y	1.7	1.8	2.6	0.7	-0.4	-0.2	0.3
15y	1.4	1.6	1.4	2.5	3.2	0.0	0.6
30y	1.6	1.3	0.7	1.5	1.6	2.2	-1.3

Source: BofA Global Research

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Skew Relative Value

Table 11: Skew 25% delta

Receiver skew RV cheap for intermediates in belly

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.8	-1.9	-2.7	-3.9	-3.6	-3.0	-0.7
3M	-1.0	-3.3	-4.5	-6.1	-5.1	-3.5	-0.4
6M	-2.2	-4.4	-5.5	-6.6	-5.7	-4.4	0.3
1Y	-3.7	-5.5	-6.4	-6.6	-5.8	-4.9	0.3
2Y	-6.4	-7.1	-7.3	-6.7	-5.3	-3.7	0.4
5Y	-7.9	-6.7	-6.3	-4.0	-2.8	-1.4	1.4
10Y	-3.3	-2.2	-1.3	0.3	0.6	1.0	2.3
30Y	-0.8	0.1	0.8	2.1	2.3	2.5	4.2

Source: BofA Global Research

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Table 12: Skew 75% delta

Payer skew RV shows richness in intermediate and longer expiries

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	2.8	4.2	5.0	6.2	5.8	5.1	2.8
3M	5.2	7.9	8.9	10.3	9.4	7.8	4.4
6M	8.5	10.7	11.6	12.3	11.5	10.0	5.1
1Y	11.5	12.8	13.4	13.2	12.1	11.0	5.7
2Y	13.9	14.3	14.3	13.5	12.0	10.3	5.7
5Y	15.4	14.3	13.9	11.7	10.5	9.0	5.2
10Y	12.3	11.3	10.4	8.8	8.3	7.6	4.8
30Y	11.8	10.9	10.1	8.6	8.1	7.5	4.7

Source: BofA Global Research

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Table 13: Breakeven Widths for Costless Receiver Ladders

107bp breakeven width for 1y10y receiver ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	29	35	35	37	36	34	32
3M	57	63	63	62	62	59	54
6M	86	90	88	85	83	79	74
1Y	131	129	125	118	112	107	100
2Y	182	176	170	162	153	147	133
5Y	238	230	224	218	212	204	181
10Y	258	257	257	258	252	245	214

Source: BofA Global Research

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Table 14: Breakeven Widths for Costless Payer Ladders

141bp breakeven width for 1y10y payer ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	31	39	40	42	41	39	33
3M	63	75	76	79	77	71	59
6M	102	111	112	112	108	101	81
1Y	164	166	165	158	150	141	111
2Y	239	236	231	220	203	187	149
5Y	349	331	322	294	277	255	198
10Y	375	358	345	322	309	294	232

Source: BofA Global Research

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Table 15: 3m Z-Score Receiver Skew (w/o direction w/ fwdts & ATM)

Receiver skew cheap for intermediate expiries in left and belly

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.4	0.3	0.2	0.1	0.1	0.1	0.4
3M	-0.2	-0.2	-0.2	-0.1	0.5	1.2	1.1
6M	-1.4	-0.8	-0.8	-0.7	-0.9	0.0	0.4
1Y	-1.9	-2.0	-1.9	-1.6	-1.3	-0.5	1.9
2Y	-2.3	-2.1	-1.8	-1.4	-1.1	-0.5	-0.1
5Y	0.8	0.5	-0.8	-0.9	-0.6	-0.2	-0.1
10Y	0.4	0.0	-0.4	-1.0	-0.8	-0.6	-0.3

Source: BofA Global Research

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Table 16: 3m Z-Score Payer Skew (w/o direction w/ fwdts & ATM)

Payer skew rich for intermediate and longer expiries on left and belly

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.4	-1.0	-1.0	-1.0	-1.4	-1.4	-1.5
3M	0.3	0.7	0.7	0.8	0.2	-0.7	-0.9
6M	1.8	1.7	1.7	1.6	1.1	0.5	-1.0
1Y	1.8	1.5	1.2	1.3	1.8	1.0	-1.8
2Y	2.3	2.1	1.0	1.8	1.2	0.5	-0.2
5Y	-0.9	-0.6	0.8	0.7	0.3	-0.4	-1.4
10Y	-0.6	-0.1	0.2	1.1	0.8	0.4	0.0

Source: BofA Global Research

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Table 17: Ratio of Payer/Receiver BE widths for Costless Ladders

Ratios of breakeven widths above 100% across the grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	107%	109%	112%	113%	114%	112%	105%
3M	112%	118%	122%	126%	124%	120%	110%
6M	119%	123%	127%	132%	129%	127%	110%
1Y	125%	129%	132%	134%	133%	132%	111%
2Y	131%	134%	136%	136%	133%	128%	112%
5Y	147%	144%	144%	135%	131%	125%	109%
10Y	145%	139%	134%	125%	123%	120%	109%

Source: BofA Global Research

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Table 18: 3m Z-Score Ratio of Payer/Receiver Skew

Z-Scores for the ratios show payer rich vs recon belly and right side

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.4	0.1	0.4	0.6	0.8	0.8	0.8
3M	-1.3	0.4	1.3	1.6	1.3	0.9	1.0
6M	-0.9	0.1	1.3	2.2	2.0	1.7	1.1
1Y	-1.0	0.3	1.5	2.2	2.5	2.2	1.0
2Y	-0.9	0.6	1.7	2.3	2.2	2.1	1.7
5Y	0.0	0.6	1.7	1.8	1.8	1.8	1.2
10Y	1.3	1.4	1.5	1.7	1.8	1.8	1.4

Source: BofA Global Research

BofA GLOBAL RESEARCH

Conditional Curve Trades

Exhibit 9: Bull Flatteners (pickup to forwards for ATM)

Buy longer maturity receiver, sell shorter maturity receiver

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-0.9	2.8	8.5	3.6	9.3	6.0
6M	1.5	6.9	14.9	5.4	13.6	8.3
1Y	6.3	16.1	26.7	10.1	21.0	11.2
1.5Y	8.7	21.0	33.9	12.8	26.1	14.0
2Y	10.3	24.9	40.1	15.3	31.2	16.9

Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 11: Bull Steepener (pickup to forwards for ATM)

Sell longer maturity receiver, buy shorter maturity receiver

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	0.9	-2.8	-8.5	-3.6	-9.3	-6.0
6M	-1.5	-6.9	-14.9	-5.4	-13.6	-8.3
1Y	-6.3	-16.1	-26.7	-10.1	-21.0	-11.2
1.5Y	-8.7	-21.0	-33.9	-12.8	-26.1	-14.0
2Y	-10.3	-24.9	-40.1	-15.3	-31.2	-16.9

Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 13: Bear Flatteners (pickup to forwards for ATM)

Sell longer maturity payer, buy shorter maturity payer

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	0.9	-3.2	-9.1	-4.0	-9.9	-6.2
6M	-1.9	-7.9	-15.5	-6.3	-14.2	-8.7
1Y	-7.5	-18.7	-28.0	-11.8	-22.2	-12.0
1.5Y	-10.6	-24.3	-35.6	-14.9	-27.6	-14.9
2Y	-12.4	-28.6	-42.3	-17.7	-32.9	-17.9

Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 15: Bear Steepener (pickup to forwards for ATM)

Buy longer maturity payer, sell shorter maturity payer

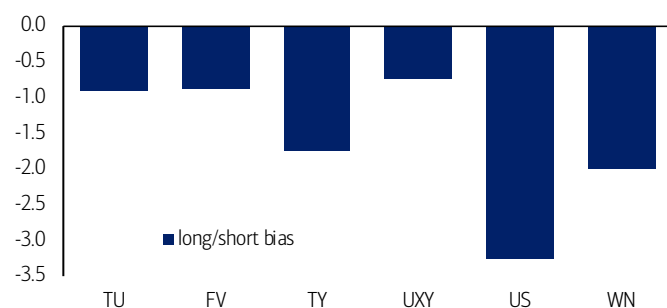
ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-0.9	3.2	9.1	4.0	9.9	6.2
6M	1.9	7.9	15.5	6.3	14.2	8.7
1Y	7.5	18.7	28.0	11.8	22.2	12.0
1.5Y	10.6	24.3	35.6	14.9	27.6	14.9
2Y	12.4	28.6	42.3	17.7	32.9	17.9

Source: BofA Global Research

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Chart 1: Analysis of proxies for futures positioning

Short bias across the curve by more significant at the backend



Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 10: Bull Flatteners (pickup to forwards for -25bp OTM)

Buy longer maturity receiver, sell shorter maturity receiver

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-0.3	4.0	11.0	4.2	11.4	7.3
6M	2.4	8.7	17.7	6.3	15.5	9.5
1Y	7.7	18.8	30.4	11.6	23.5	12.2
1.5Y	10.1	23.7	37.8	14.2	28.8	15.1
2Y	11.6	27.6	44.2	16.7	34.1	18.3

Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 12: Bull Steepener (pickup to forwards for -25bp OTM)

Sell longer maturity receiver, buy shorter maturity receiver

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	0.3	-4.0	-11.0	-4.2	-11.4	-7.3
6M	-2.4	-8.7	-17.7	-6.3	-15.5	-9.5
1Y	-7.7	-18.8	-30.4	-11.6	-23.5	-12.2
1.5Y	-10.1	-23.7	-37.8	-14.2	-28.8	-15.1
2Y	-11.6	-27.6	-44.2	-16.7	-34.1	-18.3

Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 14: Bear Flatteners (pickup to forwards for +25bp OTM)

Sell longer maturity payer, buy shorter maturity payer

+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	2.2	-4.2	-13.2	-6.2	-14.9	-9.7
6M	-1.7	-10.1	-21.0	-8.5	-19.8	-12.8
1Y	-8.7	-22.2	-34.7	-14.6	-28.2	-16.1
1.5Y	-12.0	-28.4	-42.9	-18.1	-33.9	-19.0
2Y	-14.2	-33.1	-49.7	-20.8	-39.4	-22.2

Source: BofA Global Research

BoFA GLOBAL RESEARCH

Exhibit 16: Bear Steepener (pickup to forwards for +25bp OTM)

Buy longer maturity payer, sell shorter maturity payer

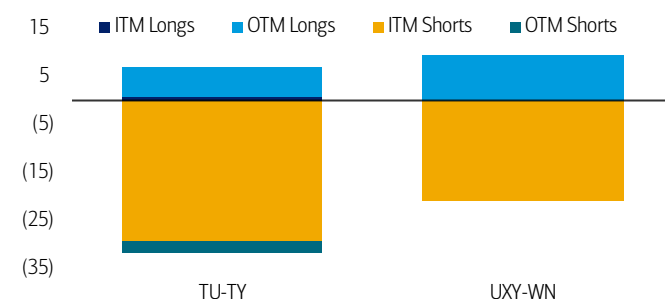
+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-2.2	4.2	13.2	6.2	14.9	9.7
6M	1.7	10.1	21.0	8.5	19.8	12.8
1Y	8.7	22.2	34.7	14.6	28.2	16.1
1.5Y	12.0	28.4	42.9	18.1	33.9	19.0
2Y	14.2	33.1	49.7	20.8	39.4	22.2

Source: BofA Global Research

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Chart 2: Proxies for futures positioning across the curve

Frontend ITM shorts may expose curve to bull steepening



Source: BofA Global Research

BoFA GLOBAL RESEARCH



Forward Volatility

Table 19: 6m Forward Volatility

107.1bp for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	138.1	137.5	127.4	112.5	98.0
3m	141.9	139.0	127.2	110.7	96.5
6m	141.7	138.5	125.9	108.6	94.6
1y	135.2	135.7	123.7	107.1	92.3
2y	136.3	131.1	118.8	102.3	86.2
5y	112.1	106.9	98.7	88.7	73.6
10y	83.6	81.7	78.2	72.7	60.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 20: 6m Fwd vol as % ATM

94% of ATM for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	133%	109%	95%	90%	88%
3m	125%	106%	96%	90%	90%
6m	115%	105%	98%	92%	93%
1y	98%	99%	96%	94%	93%
2y	99%	97%	95%	94%	93%
5y	95%	94%	95%	95%	94%
10y	96%	96%	96%	96%	96%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 21: 3m Z-Score of 6m Fwd vol % ATM

-1.5 Z-Score for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	1.7	1.1	0.4	0.2	-0.2
3m	1.2	0.7	0.2	-0.7	-0.7
6m	1.1	0.9	0.6	-1.1	-0.8
1y	0.5	0.7	-0.4	-1.5	-0.9
2y	1.2	0.2	-1.7	-2.1	-1.1
5y	-2.6	-2.9	-2.7	-2.5	-1.5
10y	-2.6	-2.5	-1.9	-1.7	-0.7

Source: BofA Global Research

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Table 22: 1y Forward Volatility

103.3bp for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	133.1	132.8	124.8	106.7	91.8
3m	137.5	135.2	125.2	106.7	91.1
6m	137.2	134.8	124.5	105.9	89.7
1y	136.4	132.2	122.8	103.3	85.9
2y	130.5	125.7	115.6	97.1	80.8
5y	108.3	104.1	95.3	85.2	69.9
10y	81.0	79.0	75.9	70.4	58.3

Source: BofA Global Research

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Table 23: 1y Fwd vol as % ATM

90% of ATM for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	129%	105%	93%	86%	83%
3m	121%	104%	94%	87%	85%
6m	111%	102%	97%	90%	88%
1y	99%	96%	96%	90%	87%
2y	94%	93%	93%	89%	87%
5y	92%	92%	92%	91%	89%
10y	93%	93%	93%	93%	92%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 24: 3m Z-Score of 1y Fwd vol % ATM

-1.1 Z-Score for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	1.9	1.1	0.5	0.0	-0.4
3m	1.3	0.8	0.4	-0.9	-0.9
6m	1.2	0.8	0.6	-1.2	-0.9
1y	0.6	0.5	-0.1	-1.1	-1.0
2y	0.9	-0.3	-1.2	-2.0	-1.1
5y	-2.2	-2.2	-2.2	-2.1	-1.4
10y	-2.1	-2.1	-1.7	-1.6	-0.8

Source: BofA Global Research

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Table 25: 2y Forward Volatility

91.6bp for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	126.1	124.3	117.3	96.7	79.2
3m	132.6	125.6	117.0	96.0	78.8
6m	131.2	122.8	114.6	93.8	77.5
1y	127.4	120.0	111.5	91.6	75.9
2y	121.9	116.8	104.4	87.4	72.1
5y	99.1	96.6	89.8	80.1	64.8
10y	77.6	75.4	73.3	67.7	55.5

Source: BofA Global Research

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Table 26: 2y Fwd vol as % ATM

80% of ATM for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	122%	98%	87%	78%	71%
3m	117%	96%	88%	78%	74%
6m	106%	93%	89%	79%	76%
1y	93%	87%	87%	80%	77%
2y	88%	87%	84%	80%	78%
5y	84%	85%	86%	86%	83%
10y	89%	88%	90%	89%	88%

Source: BofA Global Research

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Table 27: 3m Z-Score of 2y Fwd vol % ATM

-2.0 Z-Score for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	1.6	0.7	-0.1	-0.7	-1.0
3m	1.3	0.4	-0.5	-1.6	-1.2
6m	1.5	0.4	-0.6	-1.9	-1.1
1y	0.8	0.0	-1.2	-2.0	-1.2
2y	0.2	-0.6	-2.0	-2.4	-1.4
5y	-2.5	-2.5	-2.2	-2.1	-1.3
10y	-1.7	-1.8	-1.5	-1.5	-0.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 28: 3y Forward Volatility

85.7bp for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	95.5	104.1	98.6	84.7	70.2
3m	119.5	116.9	103.6	87.6	71.4
6m	123.9	119.2	102.2	86.8	70.4
1y	128.6	118.9	100.5	85.7	69.3
2y	111.5	102.9	94.9	82.2	66.4
5y	92.5	90.7	86.0	77.1	61.0
10y	75.5	73.4	71.8	66.3	53.3

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 29: 3y Fwd vol as % ATM

75% of ATM for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	92%	82%	73%	68%	63%
3m	105%	89%	78%	71%	67%
6m	101%	91%	79%	73%	69%
1y	94%	87%	78%	75%	70%
2y	81%	76%	76%	75%	71%
5y	78%	80%	83%	82%	78%
10y	86%	86%	88%	88%	84%

Source: BofA Global Research

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Table 30: 3m Z-Score of 3y Fwd vol % ATM

-2.2 Z-Score for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	1.5	1.0	-0.5	-1.1	-1.2
3m	1.4	0.6	-1.2	-2.0	-1.6
6m	1.6	0.9	-1.5	-2.2	-1.6
1y	1.4	0.7	-1.9	-2.2	-1.6
2y	-0.1	-1.1	-2.1	-2.4	-1.7
5y	-2.3	-2.4	-1.9	-1.9	-1.4
10y	-1.5	-1.7	-1.4	-1.4	-0.6

Source: BofA Global Research

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Ratios implied/delivered

Table 31: Implied vs. Delivered (21d) Ratio

Ratios > 100% except for the LLC

	1y	2y	3y	5y	7y	10y	30y
1m	111%	110%	108%	121%	124%	123%	126%
3m	103%	104%	106%	117%	120%	119%	120%
6m	94%	97%	102%	110%	113%	113%	114%
1y	93%	98%	105%	108%	108%	107%	109%
2y	103%	109%	110%	110%	107%	104%	102%

Source: BofA Global Research

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Table 32: Implied vs. Delivered (63d) Ratio

Ratios > 100% restricted to short gamma on the right side

	1y	2y	3y	5y	7y	10y	30y
1m	91%	95%	94%	101%	104%	106%	108%
3m	87%	91%	92%	97%	102%	103%	103%
6m	81%	86%	89%	92%	97%	98%	98%
1y	84%	88%	91%	92%	93%	95%	94%
2y	91%	92%	91%	94%	93%	93%	88%

Source: BofA Global Research

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Table 33: 3m Z-Scores for Implied vs. Delivered (21d) Ratio

Richness of right side vs 1m history ...

	1y	2y	3y	5y	7y	10y	30y
1m	-0.1	0.5	0.7	1.6	1.6	1.4	1.0
3m	0.2	0.7	0.9	1.6	1.7	1.5	1.0
6m	0.5	0.8	1.0	1.6	1.6	1.4	0.9
1y	0.6	0.9	1.2	1.5	1.3	1.1	0.7
2y	1.1	1.5	1.6	1.5	1.2	1.0	0.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 34: 3m Z-Scores for Implied vs. Delivered (63d) Ratio

... But cheapness of left side on 3m history

	1y	2y	3y	5y	7y	10y	30y
1m	-1.7	-1.4	-1.2	-0.6	-0.2	-0.2	-0.1
3m	-1.4	-1.1	-1.0	-0.5	0.0	0.2	-0.1
6m	-1.4	-1.1	-1.0	-0.6	0.0	0.2	-0.2
1y	-1.5	-1.0	-0.9	-0.3	0.0	0.2	-0.3
2y	-0.9	-0.7	-0.5	0.4	0.4	0.2	-0.5

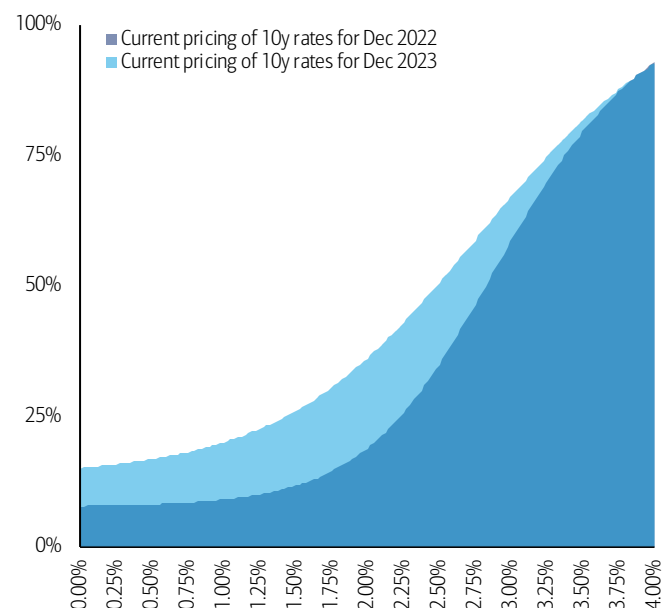
Source: BofA Global Research

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Rates probability distributions

Exhibit 17: CDF for 1y rates at end-2022 and end-2023

1y rate cumulative distribution functions

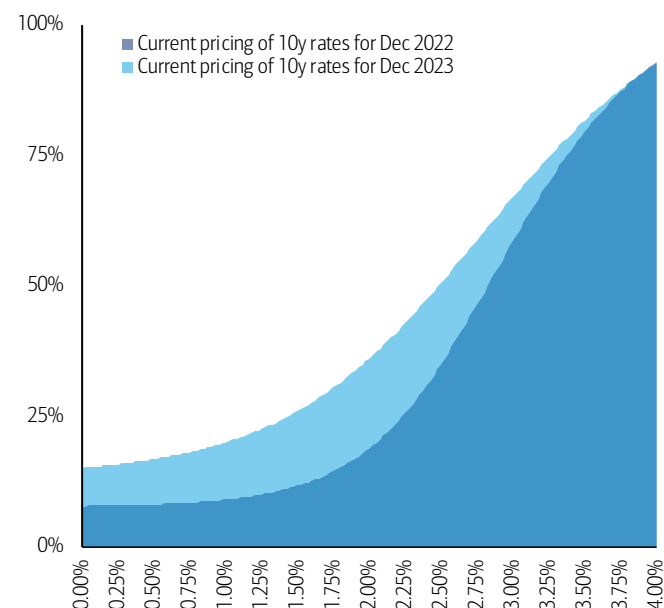


Source: BofA Global Research

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Exhibit 18: CDF for 10y rates at end-2022 and end-2023

10y rate cumulative distribution functions



Source: BofA Global Research

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Trade activity

Exhibit 19: Payer volumes over the last week (\$m notional)

Demand for payers over the last week

Payers	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	1000		80			200	245			1525
1m	1592	2170	2400		1255	140	4240	667	1070	13534
3m	1500	170			900		3074		325	5969
6m		2490	3550		901	170	2966	813	1393	12283
1y	3040	1960	80		54		2387	954	829	9304
2y	2650	3100	302		412		550		235	7254
3Y				12	735		234		1018	2004
4Y		658			20		216		10	904
5Y					250		59		40	349
7Y							50	240	15	305
10Y							78	30	662	770
20Y										
30Y										
	9782	10548	6412	12	4527	510	14099	2704	5597	54201

Source: BofA Global Research; SDR; Bloomberg

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Exhibit 20: Receiver volumes over the last week (\$m notional)

Demand for payers over the last week

Receivers	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	551				105	200	365		75	1311
1m	1152	1720	1170		1520		1894	191	1154	8801
3m	6800	460			660		605		120	8645
6m		1450			420	170	1498	405	916	4884
1y	6340	2095	210		151		1378	1228	1353	12770
2y	2650	1680			310		550		120	5310
3Y	1100			12				120	539	1771
4Y		658							75	733
5Y							349	441	340	1130
7Y										
10Y							78	55	770	903
20Y										
30Y										
	18593	8063	1380	12	3166	370	6717	2440	5462	46258

Source: BofA Global Research; SDR; Bloomberg

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Exhibit 21: Straddle volumes over the last week (\$m notional)

Demand for payers over the last week

Straddles	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m							239		50	289
1m		250			710		1532		339	2831
3m	1000				230		1272	50	140	2692
6m	2500						1045		480	4025
1y	4950	1710	240		160		2430		340	9830
2y	1250	1300			220		500		65	3335
3Y					425		125		360	910
4Y					100		340			440
5Y		250			200		181	65	109	805
7Y								135		135
10Y							414		85	499
20Y										
30Y							25			25
	9700	3510	240		2045		8103	250	1968	25816

Source: BofA Global Research; SDR; Bloomberg

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Formosa issuance

Exhibit 22: 2021 Formosa issuance (\$m)

37.7bn total issuance for the year

	2	5	7	10	15	20	25	30
1				958	30			220
2				284	45			
3					130			125
4					90			
5						50		19855
7								
10								920
15								
20								
25								
30								15000

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 23: 2022 Formosa issuance YTD (\$m)

11.6bn issuance YTD

	2	5	7	10	15	20	25	30
1			30	388	20			
2				310				
3								125
4				35	30			
5						125	80	10032
7								
10								315
15								
20								
25								
30								

Source: BofA Global Research, Bloomberg

BofA GLOBAL RESEARCH

Exhibit 24: Formosa issuance (\$m) since 2014

Peak issuance concentrated on the 5y30y tenor

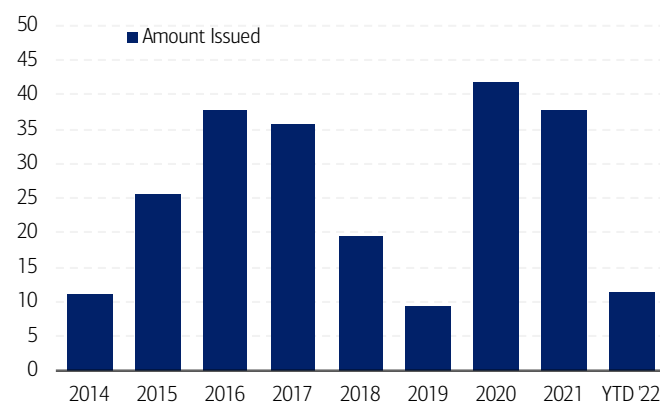
	2	5	7	10	15	20	25	30
1		205	30	1866	492	840		18274
2				748	45	1485		22177
3					130	240	225	15661
4				35	120	25	275	2441
5					400	1452	353	131319
7								5624
10								5336
15								
20								
25								
30								20500

Source: BofA Global Research, Bloomberg

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Exhibit 25: Total issuance per year since 2014 (\$bn)

11.6bn issuance YTD '22



Source: BofA Global Research, Bloomberg

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Notes

Exhibit 8: We classify the moves on the 2s10s or 5s30s curve every day in either one of these: bear flattening & bull steepening (where the 2y or 5y leg leads) or bear steepening & bull flattening (where the 10y or 30y leg leads). We sum each one of those columns over the last 2 or 3 months and divide by the absolute value of the curve moves to get a % index for each of the 4 different curve dynamics. We sum up the bear flattening + bull steepening indices into a new index - when this index = 0 the entire dynamic of the 2s10s or 5s30s curve is driven by the longer leg (10y or 30y leg respectively - corresponds to periods of forward guidance for example).

Tables 3/5/7: We calculate the principal components of the vol grid (the Eigen vectors of the covariance matrix) and take only the first 2/3 that represent around 90% of the variance in the data. We transpose the PCA transformation to recover vols from only these 2/3 components and obtain models for the vols. We calculate the residual of these models to the original series, and the Z-Score of these residuals.

Tables 4/6/8: Instead of taking the first 2/3 principal components of the vol grid and apply the transpose of the PCA transformation to them, we first regress each of these vol PCs on the principal components of rates, and apply the transpose of the vol PCA transformation to these models for the vol PCs. This way we remove the directionality between vol and rates from the vol dynamic, and obtain a purer Z-Score RV signal on vol.

Table 13/14: In a payer/receiver ladder one buys the ATM strike and then you sell ATM+/-x and ATM+/-2x. In the terminal payoff diagram the position starts losing money when the forwards move past ATM+/-3x, which we call the downside breakeven on the payer/receiver ladder.

We calculate the x (gap between strikes) daily such that the premium one has to pay for the payer/receiver ladder is zero (any vol structure that has unlimited downside can always be structured to be costless). These breakeven widths are therefore costless downside breakeven widths. When payer/receiver skew richens, this width increases - one needs to sell higher strikes ATM+/- (x+delta) and ATM+/-2(x+delta) to pay for the ATM strike bought. By looking at how these costless downside breakeven widths change over time one can measure how payer/receiver skew has richen/cheapen over time.

Table 15/16: Skew is directional with forwards and with the level of vol. We regress the costless downside breakeven widths (for receivers and payers) on the forwards and ATM vol, and look at the residuals of that regression to get a purer skew RV signal.

For more details please see [US Rates Volatility](#) and/or [A Rates Strategist Toolkit](#).



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