

US Rates Watch

Vol views – When good news is bad news...

When good news is bad news...

“Do not fight the Fed” has been an established mantra in the market, investing “high ground” particularly in the turbulent waters post-GFC as the central bank footprint in markets increased. The nature of the problems facing monetary policy makers may have changed significantly over the past year, from capping disinflationary pressures and smoothing the cycle by softening the impact of recessions, into fighting historically high inflation, but it would be unwise in our view to challenge this long established mantra.

One can argue that the Fed may show some flexibility on inflation in the current cycle given the material exogenous shocks (say at c3% vs. an historical commitment to the 2% target). However, 9% handles on inflation are clearly outside the range of acceptable scenarios, and these imply a hawkish Fed bias until signs of slowing inflation are clear. In this context, the July payrolls print starts to tip the scales towards “good news is bad news”: it supports a stickier inflation view, a more hawkish Fed, and increases the probability of harder landing scenarios - [a risk that the market seems to be underpricing](#).

There are two tail risks within the broader scenario of un-anchoring inflation:

- A Fed shift towards targeting real policy rates near-term and a higher terminal rate, which drivers a more significant curve inversion and frontloads recession risks. We recommended hedging this scenario through [1y1y costless payer ladders](#) (currently +4bp, risk an overshoot of the c.5.1% current downside breakeven, with potentially unlimited downside), [buying 1y1y payers financed with 3y1y payers](#) and [1y fwd 2s10s curve floors](#) (we recommended closing the last two hedges in our [Global Rates weekly](#) ahead of the payrolls print, as we saw a more bounded Fed from here... perhaps slightly too early in light of the subsequent events).
- A Fed that starts to shows some complacency around inflation prints slightly above target (e.g. in the low-3% context as we noted above). This assumes a relatively rapid convergence of inflation towards those levels, and longer term expectations well anchored around 2%, which has been the baseline for the market. This scenario implies a higher steepening potential for the curve both in a bull steepening dynamic (as the Fed starts to cut rates, the scope for easing increases in this scenario at the same time as backend yields stay more anchored) and the subsequent bear steepening dynamic (as the cycle enters a new early expansion phase). In [UST curve nearing inflection with slowdown risks](#), we recommended hedging this scenario by scaling into 1y fwd 2s10s caps spreads (breakeven 23bp, currently -23bp) and 2y fwd 2s10s caps (breakeven 45bp, currently +10bp). Risks on both these positions are limited to the upfront premium.

These two tail risks (within the broader inflation an-anchoring scenario) are mutually exclusive (indeed, while one bear-flattens the curve more significantly, the other creates steepening pressures in forwards). Significantly also, while both constitute a departure from its recent framework, the former is likely more aligned with Fed orthodoxy.

08 August 2022

Rates Research
United States

Bruno Braizinha, CFA
Rates Strategist
BofAS
bruno.braizinha@bofa.com

Anna (Caiyi) Zhang
Rates Strategist
BofAS
cai.yi.zhang@bofa.com

US Rates Research
BofAS
+1 646 855 8846

ULC – Upper left corner

URC – Upper right corner

LLC – Lower left corner

LRC – Lower right corner

ITM – In the money

OTM – Out of the money

GFC – Great Financial crisis

ATM – At The Money

PCA – Principal Component Analysis

CoW – Change On Week

For a list of our open and closed trades over the past 12 months, please see our most recent [Global Rates Weekly](#)

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Timestamp: 08 August 2022 02:46PM EDT

What does this all mean for volatility near-term?

The July payrolls print, and border data strength generally, also supports a skew towards the former: the pricing of a higher terminal, a more significant curve inversion, a shift towards a “good news is bad news” dynamic and higher hard landing probabilities.

However, we caution about inferring too much from any one data point, as we have seen recently a significant dispersion in macro-economic data. Generally, there are two periods in the cycle where we see this increase in dispersion: (1) as the market comes out of a recession and enters an early expansion, with some indicators pointing to the recovery while others still reflect the slowdown; and (2) late in the cycle with an expected slowdown ahead, and some macro data pointing to deteriorating fundamentals while other still shows signs of strength – essentially where we stand currently.

Volatility is supported over these periods of higher macro dispersion, and from this perspective, perhaps the most important take-away from the recent payrolls print is that the range of outcomes is likely to stay wide and volatility is supported near-term. Significantly also, the recent Fed shift towards a more data dependent stance amplifies this support for volatility. We have argued that the Fed was virtually on auto pilot on the way to the neutral, particularly once it removed references to transitory inflation as yoy inflation prints breezed past mid-4% levels in late '21. However, as Powell emphasized in the July meeting, policy rates are now around neutral, which makes the Fed more data dependent from here on. A data dependent Fed in the context of a wide dispersion in the data amplifies volatility near-term, with peak uncertainty over the next 3m.

Near vs. medium term...

At a medium term horizon, however, it is important to discern the forest from the trees. Our bias is for a decrease in data dispersion and a recoupling of macro data to the downside over the next couple of quarters. This view is supported by the pivot priced for the Fed in curve forwards at a 6m horizon, which has persisted despite the higher terminal repricing; the extremely compressed nature of the current cycle; the globally synchronized slowdown that we are seeing; and the trickle down of evidence that confirms it is not an accident that growth printed negative for the last two quarters. To some extent, this view is also supported by the Fed re-commitment to the nominal neutral rate at the July FOMC meeting, significant in the current high inflation context (with the Fed seemingly pushing back against the first tail risk above).

In this context, USTs should move from trading cheap to fundamentals to trading in line or rich to fundamentals (which we see at c.2.65% for 10yT). How rich potentially? As we argued in [10yT back to fundamentals, what next?](#), a mean reversion to c.2% levels for 10yT over the next 6-12m should not come as a shock in harder landing scenarios. The outlook for volatility should be lower medium term in this context of recoupling of data to the downside, along with a flatter grid between the left and the right side.

When expressing this bias, the higher volatility context near term clearly favors positions that offer longer staying power, potentially paying some premium to cap the downside, and looking at horizons around 6-12m, and less for the next 3m. We favor:

- Hedges for harder landing scenarios which as we noted above seem to be underpriced. Our bias has been for receivers or receivers spreads in the belly at 6m horizons, either outright or financed by selling European receivers (see [EUR vs US rates: positioning for UST outperformance](#)).
- Hedges for tail risks scenarios linked to an un-anchoring of inflation on the upside, like the positions discussed above.
- Tactically, we continue to like to trade the 10y rate range with a bullish bias, adding to duration of upticks in yields and lightening up on the positions when converging back to fair value. Portfolios are likely to continue to focus on quality, liquidity and safety, which supports our tactical stance on duration.



Levels and Recent Moves

Exhibit 1: ATM Normal Volatility Grid

105.1bp for 1y10y volatility

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	140.3	153.9	150.2	141.5	130.5	119.4	102.7
3M	143.3	158.2	152.5	139.0	128.2	117.3	100.9
6M	155.1	154.8	148.4	133.5	123.1	112.6	96.9
1Y	157.4	148.0	141.0	124.5	114.3	105.1	89.3
2Y	140.6	132.6	125.7	112.9	105.0	97.8	82.6
3Y	124.9	118.3	113.3	103.8	97.8	91.9	77.6
4Y	113.5	107.6	103.9	97.2	92.4	87.1	73.6
5Y	104.8	99.3	96.5	91.3	87.8	83.4	70.5
10Y	81.2	78.9	77.2	74.1	72.0	69.5	59.5
30Y	58.6	56.9	55.6	53.4	51.9	50.1	42.9

Source: BofA Global Research

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Exhibit 2: ATM Volatility Grid - 3m Z-Scores

Left side and belly fair to rich on 3m Z-Scores

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.0	0.0	0.1	0.2	0.1	-0.2	-0.3
3M	0.1	0.4	0.4	0.4	0.2	0.0	-0.1
6M	0.5	0.5	0.4	0.3	0.1	-0.2	-0.2
1Y	0.7	0.4	0.4	0.0	-0.2	-0.5	-0.6
2Y	0.3	0.1	-0.1	-0.5	-0.6	-0.8	-0.7
3Y	-0.3	-0.5	-0.7	-1.0	-1.0	-1.0	-0.8
4Y	-0.8	-1.0	-1.1	-1.2	-1.2	-1.2	-0.9
5Y	-1.0	-1.3	-1.3	-1.4	-1.3	-1.2	-1.0
10Y	-1.1	-1.1	-1.2	-1.4	-1.2	-1.0	-0.6
30Y	-0.9	-1.0	-1.0	-1.2	-1.1	-0.9	-0.3

Source: R BofA Global Research

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Exhibit 3: ATM Normal Volatility Grid - CoW

Intermediates on left side outperformed on the grid over the last week

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	1.6	8.7	10.3	11.5	8.9	6.4	4.9
3M	6.1	12.9	13.0	10.5	8.0	5.6	4.2
6M	12.6	12.4	12.7	10.2	8.6	6.4	4.9
1Y	14.1	11.1	10.9	7.1	5.7	4.3	3.2
2Y	9.8	9.2	7.7	5.0	4.0	3.1	3.6
3Y	7.0	7.2	5.9	3.6	3.0	2.4	3.4
4Y	5.1	4.9	4.3	3.1	2.6	2.0	3.0
5Y	4.4	3.8	3.4	2.6	2.2	1.7	2.6
10Y	1.8	1.8	1.7	1.7	1.6	1.6	2.0
15Y	2.3	2.2	2.2	2.1	2.0	2.0	2.3
30Y	1.7	1.6	1.6	1.5	1.5	1.4	1.7

Source: BofA Global Research

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Exhibit 4: ATM Straddle Premiums (indicative only)

7.1% straddle premiums for 1y10y

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.3%	0.7%	1.0%	1.5%	1.9%	2.4%	5.0%
3M	0.6%	1.2%	1.7%	2.6%	3.3%	4.1%	8.5%
6M	0.8%	1.7%	2.4%	3.4%	4.3%	5.5%	11.3%
1Y	1.2%	2.2%	3.1%	4.5%	5.6%	7.1%	14.6%
2Y	1.5%	2.7%	3.8%	5.6%	7.1%	9.1%	18.7%
3Y	1.6%	2.9%	4.1%	6.2%	7.9%	10.2%	21.1%
4Y	1.6%	3.0%	4.3%	6.5%	8.4%	10.9%	22.6%
5Y	1.6%	3.0%	4.3%	6.7%	8.7%	11.4%	23.7%
10Y	1.6%	3.0%	4.3%	6.7%	8.9%	11.8%	25.7%
15Y	1.4%	2.8%	4.0%	6.3%	8.3%	11.2%	25.0%
30Y	1.2%	2.4%	3.4%	5.4%	7.3%	9.9%	23.9%

Source: BofA Global Research

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Exhibit 5: 1y10y normal vol

Vol > 85bp top end of the expected range in '22



Source: BofA Global Research; Bloomberg

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Exhibit 6: 3m10y vs. 3m2y Normal Volatility

Left side stayed under pressure vs right over the last week

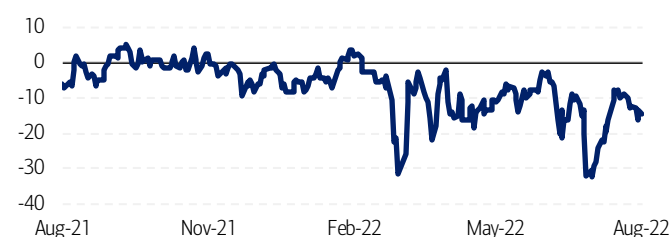


Source: BofA Global Research; Bloomberg

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Exhibit 7: 1y10y vs. 1m10y Normal Volatility

Vol inversion deepened in the last week

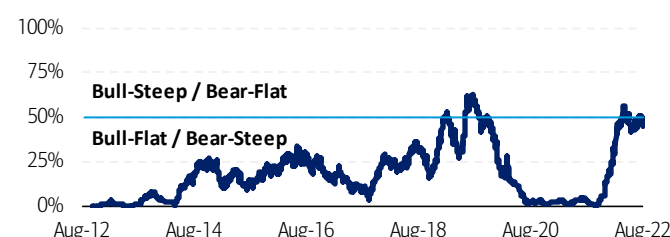


Source: BofA Global Research; Bloomberg

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Exhibit 8: 2s10s curve directionality 50% 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

Exhibit 9: 3m Z-Scores w/ PCA framework

Some richness in gamma on 3m Z-Scores

	1y	2y	3y	5y	7y	10y	30y
3m	-2.9	0.3	1.2	1.2	0.7	0.3	0.3
6m	-1.2	1.2	1.9	2.2	1.9	1.2	0.6
1y	-0.5	-1.8	0.3	1.6	1.1	0.2	0.0
2y	-1.4	-0.1	1.1	0.2	-0.2	-0.7	0.0
5y	-0.6	-1.2	-1.4	-2.2	-2.4	-2.7	-0.9
10y	-1.8	-1.7	-1.8	-1.9	-1.8	-1.5	-0.3

Source: BofA Global Research

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Exhibit 11: 6m Z-Scores w/ PCA framework

Some richness in gamma and left side on 6m Z-Scores

	1y	2y	3y	5y	7y	10y	30y
3m	-3.6	0.0	0.4	0.7	0.3	-0.3	1.7
6m	-0.1	1.4	1.8	1.6	0.8	-0.1	0.0
1y	2.0	1.9	2.0	0.6	-0.5	-1.1	-1.0
2y	1.2	1.4	0.9	-2.2	-2.0	-1.8	-1.2
5y	-1.8	-2.4	-2.9	-3.5	-3.4	-2.9	-1.6
10y	-2.1	-1.9	-2.1	-2.4	-2.1	-1.7	-1.0

Source: BofA Global Research

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Exhibit 13: 1y Z-Scores w/ PCA framework

Some richness in gamma and left side on 1y Z-Scores

	1y	2y	3y	5y	7y	10y	30y
3m	-3.5	-3.7	0.7	1.7	1.2	0.6	0.1
6m	0.3	1.0	2.9	2.2	1.7	0.8	0.1
1y	0.8	1.2	2.0	1.3	0.0	-0.9	-1.4
2y	0.9	1.1	0.8	-1.8	-2.3	-2.2	-1.9
5y	-2.0	-2.9	-3.4	-4.2	-4.2	-3.7	-2.4
10y	-2.6	-2.5	-2.7	-3.1	-2.9	-2.4	-1.6

Source: BofA Global Research

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Exhibit 15: 3m Z-Scores w/ modified PCA framework ...

More granular approach shows richness virtually across the grid...

	1y	2y	3y	5y	7y	10y	30y
1m	1.0	0.7	0.9	1.4	1.3	0.4	0.5
3m	1.3	2.1	1.1	0.8	0.1	0.9	1.0
6m	1.0	1.5	1.4	1.5	0.9	0.4	0.9
1y	1.0	1.2	1.7	1.5	1.7	1.1	0.4
2y	1.2	1.0	1.3	1.2	0.7	0.9	0.2
3y	1.1	1.1	1.0	0.2	0.1	0.9	1.0
4y	0.7	-0.1	-0.4	1.1	0.6	-0.5	-0.3
5y	0.9	2.3	0.1	0.2	-1.0	0.1	-2.1
10y	0.9	1.3	1.7	1.0	-0.7	-1.4	-0.3
15y	-0.6	-0.4	-1.2	0.9	-1.0	-0.9	0.7
30y	-0.2	-0.3	0.3	0.6	1.4	1.6	-0.2

Source: BofA Global Research

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Exhibit 10: 3m Z-Scores w/ PCA framework w/o rates directionality

Grid fair to cheap when directionality taken into account

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

Source: BofA Global Research

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Exhibit 12: 6m Z-Scores w/ PCA framework w/o rates directionality

Grid fair to cheap when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	-1.4	-0.8	-0.8	-0.8	-0.9	-1.1	-0.4
6m	-0.8	-0.7	-0.7	-0.9	-1.0	-1.1	-0.9
1y	-0.2	-0.6	-0.7	-1.1	-1.3	-1.5	-1.4
2y	-0.7	-0.8	-1.1	-1.7	-1.7	-1.8	-1.5
5y	-1.8	-2.1	-2.2	-2.5	-2.4	-2.3	-1.7
10y	-2.0	-1.8	-2.0	-2.1	-2.0	-1.8	-1.2

Source: BofA Global Research

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Exhibit 14: 1y Z-Scores w/ PCA framework w/o rates directionality

Grid fair to cheap when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	-1.5	-0.6	-0.4	0.1	0.0	-0.2	-0.4
6m	-0.8	-0.5	-0.2	0.0	0.0	-0.3	-0.4
1y	-0.5	-0.4	-0.3	-0.5	-0.8	-1.0	-1.4
2y	-0.4	-0.5	-0.7	-1.3	-1.4	-1.6	-1.8
5y	-1.6	-2.0	-2.2	-2.6	-2.6	-2.5	-2.1
10y	-2.0	-2.0	-2.2	-2.6	-2.4	-2.2	-1.6

Source: BofA Global Research

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Exhibit 16: ... and w/o directionality with rates

... persisting as directionality with rates is removed

	1y	2y	3y	5y	7y	10y	30y
1m	0.7	0.7	0.9	1.0	1.0	0.7	0.5
3m	1.5	2.0	1.1	0.8	0.2	0.8	1.1
6m	1.0	1.3	1.4	1.3	1.2	0.5	0.4
1y	1.2	1.2	1.7	1.7	1.6	1.0	0.4
2y	1.1	0.9	1.2	1.2	0.7	0.8	0.1
3y	1.0	1.2	0.6	0.3	0.5	1.5	1.5
4y	0.4	-0.2	-0.3	0.2	0.9	-0.2	0.0
5y	1.0	2.2	0.4	0.4	-1.2	-0.1	-1.8
10y	1.3	0.5	2.0	0.9	-0.3	-1.2	-0.9
15y	-0.1	-0.4	-1.3	0.7	-0.6	-0.5	0.7
30y	0.4	-0.3	0.5	1.3	1.4	1.4	-1.0

Source: BofA Global Research

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Skew Relative Value

Exhibit 17: Skew 25% delta

Receiver skew RV cheap on the LRC

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-2.1	-2.4	-2.1	-0.7	-0.4	0.1	0.6
3M	-2.2	-3.3	-3.7	-2.2	-1.2	0.1	1.2
6M	-2.5	-5.1	-5.0	-3.4	-2.2	-0.6	0.9
1Y	-6.0	-7.5	-7.3	-5.3	-3.8	-2.1	0.3
2Y	-8.7	-9.2	-7.8	-5.9	-4.4	-2.9	0.2
5Y	-7.9	-6.2	-5.2	-3.3	-2.7	-2.0	0.9
10Y	-3.0	-1.9	-1.0	-0.1	-0.1	0.0	1.6
30Y	-0.5	0.3	0.7	1.5	1.5	1.4	2.6

Source: BofA Global Research

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Exhibit 18: Skew 75% delta

Payer skew RV shows some richness on longer expiries in belly and left

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	2.3	3.5	3.1	1.5	1.1	0.7	0.1
3M	7.3	8.4	8.5	6.6	5.3	3.8	2.3
6M	10.6	12.0	11.6	9.4	7.9	6.1	3.9
1Y	13.5	14.1	13.5	11.2	9.5	7.7	4.7
2Y	14.2	14.3	13.0	11.1	9.7	8.2	4.7
5Y	13.6	12.2	11.4	9.8	9.2	8.4	4.9
10Y	11.1	10.0	9.2	8.2	8.0	7.7	4.9
30Y	10.5	9.5	9.0	7.9	7.7	7.4	4.8

Source: BofA Global Research

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Exhibit 19: Breakeven Widths for Costless Receiver Ladders

102bp breakeven width for 1y10y receiver ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	41	44	43	42	39	36	31
3M	72	78	75	69	65	60	53
6M	106	104	99	91	85	79	70
1Y	149	137	131	117	108	102	90
2Y	182	169	162	148	139	132	118
5Y	208	201	198	192	186	179	162
10Y	240	238	237	232	226	219	197

Source: BofA Global Research

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Exhibit 20: Breakeven Widths for Costless Payer Ladders

122bp breakeven width for 1y10y payer ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	43	48	46	43	39	36	31
3M	81	90	87	79	71	64	54
6M	125	128	124	109	99	89	74
1Y	188	180	171	150	136	122	100
2Y	246	236	221	197	179	164	131
5Y	309	289	277	255	244	230	181
10Y	345	327	314	296	287	277	222

Source: BofA Global Research

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Exhibit 21: 3m Z-Score Receiver Skew (w/o fwd & ATM direction)

Receiver skew fair to rich virtually cross the grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.4	0.7	0.5	0.1	-0.2	-0.3	-0.2
3M	-0.1	0.8	0.4	0.2	0.5	0.2	-0.1
6M	0.3	0.2	0.2	0.2	0.3	0.8	1.3
1Y	0.6	0.5	0.3	0.0	0.3	0.4	-0.4
2Y	-0.8	-0.4	0.1	0.4	0.8	1.3	1.2
5Y	-1.0	-0.3	2.1	0.7	0.6	-0.5	-0.3
10Y	1.3	1.5	1.5	-3.7	-2.3	-1.5	-2.0

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 22: 3m Z-Score Payer Skew (w/o direction w/ fwd & ATM)

Payer skew fair to cheap virtually cross the grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.2	0.2	0.0	-0.6	-0.7	-0.7	-0.5
3M	0.6	-0.7	-0.1	-0.5	-0.2	-0.4	-0.3
6M	-0.6	-0.3	0.0	-0.3	-0.4	-0.5	-0.1
1Y	-0.9	-0.7	-0.6	-0.1	-0.2	0.0	0.9
2Y	0.1	-0.1	-1.0	-0.9	-0.6	-1.5	-1.6
5Y	0.5	0.2	-2.1	-0.8	-0.6	0.5	0.0
10Y	-1.4	-1.6	-1.6	3.7	2.2	1.5	1.9

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 23: Ratio of Payer/Receiver BE widths for Costless Ladders

Ratios of breakeven widths above 100% virtually across the grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	107%	107%	107%	103%	102%	101%	99%
3M	113%	115%	117%	113%	110%	106%	102%
6M	118%	123%	125%	120%	117%	112%	106%
1Y	126%	131%	131%	128%	126%	120%	111%
2Y	135%	139%	136%	133%	128%	124%	111%
5Y	148%	144%	140%	133%	131%	129%	112%
10Y	144%	137%	132%	127%	127%	127%	113%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 24: 3m Z-Score Ratio of Payer/Receiver Skew

Z-Scores show fair/cheap payer vs receiver skew on the right side

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.2	-0.4	-0.5	-1.1	-1.0	-1.0	-1.0
3M	0.3	0.0	0.1	-0.4	-0.6	-0.9	-0.7
6M	0.3	0.1	0.3	-0.3	-0.5	-0.8	-0.3
1Y	0.4	0.1	-0.1	-0.3	-0.2	-0.7	0.1
2Y	0.8	0.9	-0.1	-0.3	-0.9	-0.7	-0.7
5Y	1.4	0.6	-1.7	-0.3	0.5	1.3	0.9
10Y	-0.1	-0.2	-0.2	2.7	2.6	2.0	2.1

Source: BofA Global Research

BofA GLOBAL RESEARCH

Conditional Curve Trades

Exhibit 25: 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	7.1	14.6	19.6	8.1	13.6	6.2
6M	10.8	20.6	27.2	10.6	18.1	8.3
1Y	16.3	29.0	38.4	13.8	24.3	11.4
1.5Y	18.5	32.7	44.2	15.7	28.4	13.8
2Y	19.2	33.3	46.4	15.1	29.6	15.5

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 27: 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	-7.1	-14.6	-19.6	-8.1	-13.6	-6.2
6M	-10.8	-20.6	-27.2	-10.6	-18.1	-8.3
1Y	-16.3	-29.0	-38.4	-13.8	-24.3	-11.4
1.5Y	-18.5	-32.7	-44.2	-15.7	-28.4	-13.8
2Y	-19.2	-33.3	-46.4	-15.1	-29.6	-15.5

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 29: 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	-7.7	-15.1	-19.8	-8.3	-13.8	-6.3
6M	-12.0	-21.8	-27.8	-11.4	-18.7	-8.5
1Y	-18.8	-31.5	-39.9	-15.3	-25.5	-12.2
1.5Y	-21.6	-36.2	-46.2	-17.7	-29.8	-14.6
2Y	-22.8	-37.2	-48.5	-17.3	-31.3	-16.5

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 31: Bear Steepener (pickup to forwards for ATM)

Buy longer maturity payer, sell shorter maturity payer

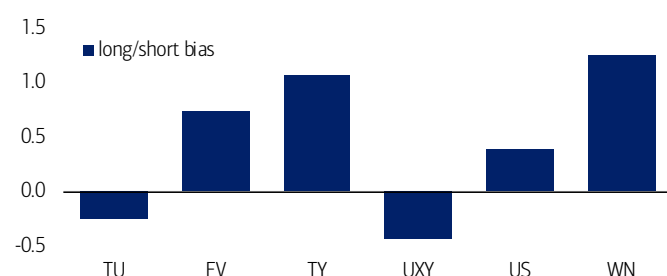
ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	7.7	15.1	19.8	8.3	13.8	6.3
6M	12.0	21.8	27.8	11.4	18.7	8.5
1Y	18.8	31.5	39.9	15.3	25.5	12.2
1.5Y	21.6	36.2	46.2	17.7	29.8	14.6
2Y	22.8	37.2	48.5	17.3	31.3	16.5

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 33: Analysis of proxies for futures positioning

... suggests shorts in belly and backend, small longs still in TU and UXY



Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 26: 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	9.1	18.5	25.3	10.3	17.9	8.5
6M	12.8	24.5	32.7	12.8	22.0	10.3
1Y	18.7	33.1	44.0	15.9	28.0	13.4
1.5Y	20.4	36.6	49.5	17.7	31.9	15.5
2Y	21.2	36.6	51.5	16.9	32.9	17.3

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 28: 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	-9.1	-18.5	-25.3	-10.3	-17.9	-8.5
6M	-12.8	-24.5	-32.7	-12.8	-22.0	-10.3
1Y	-18.7	-33.1	-44.0	-15.9	-28.0	-13.4
1.5Y	-20.4	-36.6	-49.5	-17.7	-31.9	-15.5
2Y	-21.2	-36.6	-51.5	-16.9	-32.9	-17.3

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 30: 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	-10.3	-20.6	-27.4	-12.0	-19.8	-9.3
6M	-15.1	-27.8	-36.0	-15.1	-24.9	-11.8
1Y	-22.6	-38.2	-48.5	-19.2	-32.1	-15.9
1.5Y	-25.3	-42.9	-55.0	-21.6	-36.6	-18.5
2Y	-26.5	-43.5	-57.3	-20.6	-37.8	-20.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 32: Bear Steepener (pickup to forwards for +25bp OTM)

Buy longer maturity payer, sell shorter maturity payer

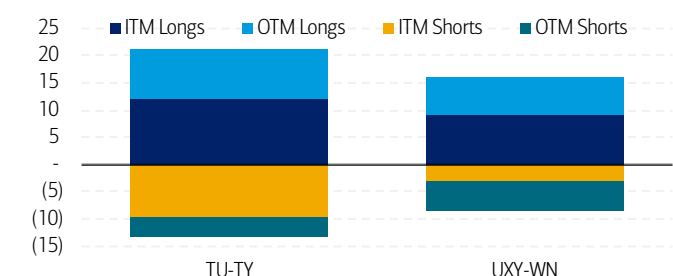
+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	10.3	20.6	27.4	12.0	19.8	9.3
6M	15.1	27.8	36.0	15.1	24.9	11.8
1Y	22.6	38.2	48.5	19.2	32.1	15.9
1.5Y	25.3	42.9	55.0	21.6	36.6	18.5
2Y	26.5	43.5	57.3	20.6	37.8	20.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 34: Proxies for futures positioning across the curve

OTM frontend longs expose curve to bear flattening



Source: BofA Global Research

BofA GLOBAL RESEARCH



Forward Volatility

Exhibit 35: 6m Forward Volatility

95.9bp for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	153.2	140.0	119.4	100.1	85.4
3m	155.7	141.3	117.9	97.8	82.1
6m	156.2	142.6	117.6	96.8	80.4
1y	147.0	139.5	116.3	95.9	79.7
2y	132.5	124.9	105.5	90.3	75.1
5y	99.5	94.5	86.9	78.6	65.9
10y	76.5	74.3	70.3	65.8	56.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 36: 6m Fwd vol as % ATM

91% of ATM for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	109%	91%	84%	84%	83%
3m	109%	89%	85%	83%	81%
6m	101%	92%	88%	86%	83%
1y	93%	94%	93%	91%	89%
2y	94%	94%	93%	92%	91%
5y	95%	95%	95%	94%	94%
10y	94%	94%	95%	95%	95%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 37: 3m Z-Score 6m Fwd vol % ATM

-1.4 Z-Score for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	0.2	0.0	-0.6	-0.5	-0.6
3m	0.3	-0.4	-1.0	-1.2	-1.5
6m	0.0	-0.3	-1.0	-1.4	-2.0
1y	-0.9	-0.3	-0.7	-1.4	-1.5
2y	-0.9	-0.7	-1.3	-1.2	-1.2
5y	-0.1	0.2	0.5	-0.5	-0.8
10y	-0.4	-0.7	-1.3	-1.4	-0.9

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 38: 1y Forward Volatility

93.1bp for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	149.5	143.0	122.0	98.8	81.2
3m	147.1	141.8	121.0	97.9	80.6
6m	145.6	139.6	118.8	96.7	79.6
1y	142.3	131.2	110.7	93.1	76.3
2y	121.4	115.8	101.7	87.0	72.0
5y	95.6	91.9	84.9	76.6	63.7
10y	74.4	72.2	68.6	64.0	55.0

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 39: 1y Fwd vol as % ATM

89% of ATM for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	107%	93%	86%	83%	79%
3m	103%	90%	87%	83%	80%
6m	94%	90%	89%	86%	82%
1y	90%	89%	89%	89%	85%
2y	86%	87%	90%	89%	87%
5y	91%	93%	93%	92%	90%
10y	92%	92%	93%	92%	92%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 40: 3m Z-Score 1y Fwd vol % ATM

-0.8 Z-Score for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	0.2	0.3	-0.4	-0.3	-0.6
3m	0.1	-0.3	-0.7	-0.9	-1.3
6m	-0.5	-0.4	-0.8	-1.1	-1.2
1y	-0.9	-0.6	-1.2	-0.8	-0.4
2y	-1.3	-1.1	-1.2	-0.7	-0.2
5y	-1.2	0.0	0.5	0.1	0.0
10y	-0.2	-0.3	-0.7	-0.7	0.0

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 41: 2y Forward Volatility

84.7bp for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	115.4	113.7	101.3	88.1	71.0
3m	116.7	112.6	101.1	87.3	70.8
6m	117.8	110.7	100.9	86.5	70.4
1y	117.2	106.9	99.5	84.7	69.0
2y	104.1	102.9	95.6	81.1	66.2
5y	89.3	87.3	81.1	72.9	59.5
10y	71.2	69.0	65.9	61.2	52.1

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 42: 2y Fwd vol as % ATM

81% of ATM for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	82%	74%	72%	74%	69%
3m	81%	71%	73%	74%	70%
6m	76%	71%	76%	77%	73%
1y	74%	72%	80%	81%	77%
2y	74%	78%	85%	83%	80%
5y	85%	88%	89%	87%	84%
10y	88%	87%	89%	88%	88%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 43: 3m Z-Score 2y Fwd vol % ATM

-0.8 Z-Score for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	-0.6	-0.5	-1.1	-0.8	-0.8
3m	-0.7	-0.9	-1.3	-1.1	-1.0
6m	-1.2	-1.1	-1.3	-1.1	-1.0
1y	-1.7	-1.3	-1.3	-0.8	-0.3
2y	-1.3	-1.3	-0.9	-0.6	-0.1
5y	-1.3	0.0	0.3	0.1	-0.1
10y	-0.4	-0.4	-0.8	-0.7	-0.2

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 44: 3y Forward Volatility

81.1bp for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	75.5	81.3	92.5	80.7	65.2
3m	79.8	85.5	93.4	80.7	65.1
6m	89.9	93.0	95.3	81.3	65.1
1y	108.7	101.7	96.0	81.1	64.5
2y	102.5	96.2	89.9	77.6	62.4
5y	84.8	83.2	77.4	69.7	56.4
10y	68.9	66.6	63.9	59.3	49.7

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 45: 3y Fwd vol as % ATM

77% of ATM for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	54%	53%	65%	68%	63%
3m	56%	54%	67%	69%	65%
6m	58%	60%	71%	72%	67%
1y	69%	69%	77%	77%	72%
2y	73%	73%	80%	79%	76%
5y	81%	84%	85%	84%	80%
10y	85%	84%	86%	85%	84%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 46: 3m Z-Score 3y Fwd vol % ATM

-0.9 Z-Score for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	-0.9	-1.1	-1.2	-1.1	-0.9
3m	-1.0	-1.3	-1.3	-1.5	-1.0
6m	-1.3	-1.4	-1.4	-1.5	-0.8
1y	-1.7	-1.5	-1.1	-0.9	-0.2
2y	-0.9	-1.0	-0.5	-0.2	-0.1
5y	-0.6	0.3	0.0	-0.1	-0.1
10y	-0.5	-0.5	-1.1	-1.0	-0.4

Source: BofA Global Research

BofA GLOBAL RESEARCH

Ratios implied/delivered

Exhibit 47: Implied vs. Delivered (21d) Ratio

Ratios of Implied to 21d delivered <100% virtually across the grid

	1y	2y	3y	5y	7y	10y	30y
1m	100%	101%	95%	93%	92%	92%	111%
3m	91%	97%	92%	90%	89%	89%	108%
6m	90%	90%	87%	85%	84%	86%	103%
1y	88%	84%	83%	80%	80%	82%	96%
2y	79%	79%	79%	78%	78%	81%	90%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 48: Implied vs. Delivered (63d) Ratio

Ratios of Implied to 63d delivered <100% virtually across the grid

	1y	2y	3y	5y	7y	10y	30y
1m	104%	102%	96%	94%	91%	89%	98%
3m	94%	98%	94%	90%	88%	87%	95%
6m	91%	90%	88%	85%	84%	83%	91%
1y	87%	84%	84%	80%	79%	78%	84%
2y	81%	82%	80%	77%	76%	76%	79%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 49: 3m Z-Scores for Implied vs. Delivered (21d) Ratio

Ratios of implied/21d delivered fair to rich across the grid

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

Source: BofA Global Research

BofA GLOBAL RESEARCH

Exhibit 50: 3m Z-Scores for Implied vs. Delivered (63d) Ratio

Ratios of implied/63d delivered fair to rich across the grid

	1y	2y	3y	5y	7y	10y	30y
1m	0.1	0.2	0.2	0.4	0.4	0.3	1.3
3m	0.2	0.7	0.5	0.6	0.6	0.6	1.8
6m	0.7	0.6	0.5	0.5	0.5	0.6	1.8
1y	0.9	0.4	0.4	0.3	0.3	0.4	1.5
2y	0.1	0.2	0.3	0.1	0.2	0.5	1.6

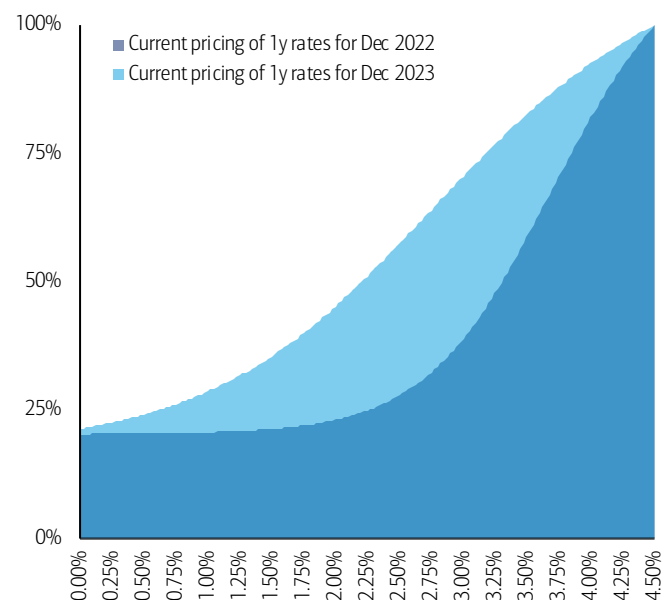
Source: BofA Global Research

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Rates probability distributions

Exhibit 51: CDF for 10y rates at end-2022 and end-2023

1y rate cumulative distribution functions

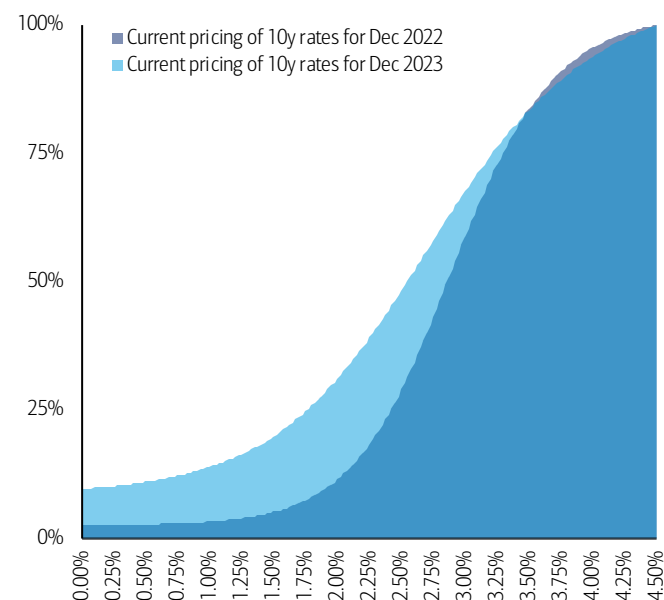


Source: BofA Global Research

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Exhibit 52: CDF for 10y rates at end-2022 and end-2023

10y rate cumulative distribution functions



Source: BofA Global Research

BofA GLOBAL RESEARCH

Trade activity

Exhibit 53: 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							687	120	366	1173
1m	6900	15			1520	115	4464	241	688	13943
3m	4130	980			465		4393		29	9997
6m	502	250			550		895	440	661	3358
1y	8903	780			120	117	1715	4	846	12689
2y	1950	460					788		165	3363
3Y	4241				88		100		54	4483
4Y							100			100
5Y					70		60	177		307
7Y										
10Y					50		355	1073		1478
20Y										
30Y										
	26626	2485			2863	232	13558	2055	2809	50892

Source: BofA Global Research; SDR; Bloomberg

BofA GLOBAL RESEARCH

Exhibit 54: 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							250	120	100	470
1m	2000	15			300		2197	241	299	5052
3m		1280					3461		269	5010
6m		265			450		498	360	885	2458
1y	7600	1315			120	627	1417		816	11895
2y	3400	920					248		65	4633
3Y	6541				150		100		628	7419
4Y							250	50		300
5Y					550			23		573
7Y										
10Y							355	686		1041
20Y										
30Y										
	19541	3795			1570	627	8776	1480	3062	38851

Source: BofA Global Research; SDR; Bloomberg

BofA GLOBAL RESEARCH

Exhibit 55: 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							50			50
1m		200			540		867		305	1912
3m	250				350		2030		510	3140
6m	1500	540			400		515	150	650	3755
1y	5050	660	300		500	220	2005	155	560	9450
2y	2300	1450	100		83	150	250	125	100	4558
3Y	150	430	150				1845		175	2750
4Y							170	139	50	359
5Y	250				238		175	89		752
7Y	100						175	50	75	400
10Y					100		1825	150	90	2165
20Y			150							150
30Y										
	9600	3280	700		2211	370	9907	858	2515	29441

Source: BofA Global Research; SDR; Bloomberg

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Formosa issuance

Exhibit 56: 2021 Formosa issuance (\$m)

37.7bn total issuance for the year, 32.1bn over same period as ytd

	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

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Exhibit 57: 2022 Formosa issuance YTD (\$m)

12.3bn issuance YTD

	2	5	7	10	15	20	25	30
1			75	513	20			
2		40		435				
3				70	20			125
4		15		75	50			
5				20	45	140	80	10226
7			30					
10								315
15								
20								
25								
30								

Source: BofA Global Research, Bloomberg

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Exhibit 58: Formosa issuance (\$m) since 2014

Peak issuance concentrated on the 5y30y tenor

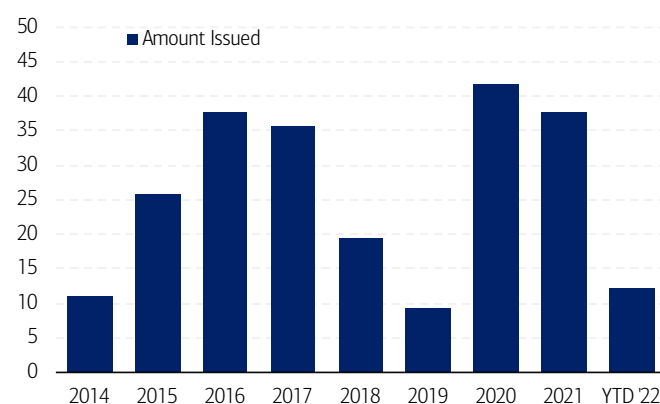
	2	5	7	10	15	20	25	30
1		205	75	1991	492	840		18274
2		40		873	45	1485		22177
3				70	150	240	225	15661
4		15		75	140	25	275	2441
5				20	445	1467	353	131513
7			30					5624
10								5336
15								
20								
25								
30								20500

Source: BofA Global Research, Bloomberg

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Exhibit 59: Total issuance per year since 2014 (\$bn)

12.3bn issuance YTD '22 (vs. 32.1bn same period '21)



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).

Exhibit 11/13/15: 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.

Exhibit 12/14/16: 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.

Exhibit 21/22: 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.

Exhibit 23/24: 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](#).

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