

US Rates Watch

Vol views – left side on fire

Left side vol on fire

The market has priced the first order impact of supply chain disruptions as lower growth, and the second order impact a more hawkish Fed that is forced to counter inflationary pressures and hence reinforces the lower growth view (as it chokes the recovery in the process). These pressure the curve flatter not only through lower backend yields (terminal rate expectations under pressure) but also higher frontend yields (hikes get prices in). On the vol grid, they imply a significant outperformance of the left vs. the right side (see Exhibit 1 for the grid moves since the Sep FOMC meeting). The normal early cycle dynamic of higher inflation expectations = backend driven selloff as it inject term premium and inflation risk premium on the curve, is less than an afterthought.

In forwards the 1y2y led the bearish dynamic since the Sep FOMC meeting, with a 40bp move (see Exhibit 2). We can't help but wonder about the limits to this dynamic:

- While there is a demand and liquidity driven components to the recent inflationary pressures, with too much cash chasing too few assets, there is also a significant contribution from real logistical problems in global supply chains. Tighter monetary policy may counter the former, but is unlikely to be able to address the latter.
- The recent repricing has been exacerbated by the broadening of supply chain disruptions into the energy complex. The sensitivity of longer term inflation expectations (measured by backend breakevens) to the energy complex is generally low. The oil complex is the most volatile component of the basket, but also generally seen as more transitory impact on inflation. One should expect to see a more significant impact in backend yields only when the inflation view shifts from transitory to more persistent - as it happened in 2014 on the downside where we saw a pickup of backend breakevens and oil correlations after the commodities rout as the market priced a lower inflation regime for longer. There is a high threshold for a supply driven energy complex shock to drive such a shift in longer term inflation expectations, as we argued in [USTs and the 2022 allocation backdrop](#).

The recent knee-jerk pricing of a sooner than expected Fed liftoff (first hike priced for Sep 22 with two by end-22 with 69% probability - Exhibit 3) and aggressive ramp up (5 hikes priced in by end-23 - Exhibit 4), is perhaps somewhat excessive in this context. Particularly as this "stagflation" configuration seems to be the most challenging for central banks (see [Stagflation, no. Stagflation, yes](#)). Fed officials have shown no interest in pushing back against the recent repricing. Yet a recent economic bulletin from the Kansas City Fed is noteworthy in this context as it argues that "normalizing the balance sheet before raising the funds rate might forestall yield curve inversion and, in turn, support economic stability"¹, an added risk to the recent repricing.

Below we show the usual set of RV monitors for volatility, including RV across the four main rotations of the grid: (1) broad under/out-performance, (2) gamma vs intermediates and vega, (3) left side vs right side; and (4) steeper/flatter skew.

¹ <https://www.kansascityfed.org/documents/8443/eb21diltssstedmangulatil014.pdf>

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Rates Research
United States

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

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

US Rates Research
BofA
+1 646 855 8846

ULC – upper left corner
URC – upper right corner
LRC – lower right corner
LRC – lower right corner

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Exhibit 1: Moves on the US vol grid since the Sep FOMC meeting

Left side leading the outperformance

	1y	2y	3y	5y	7y	10y	30y
1m	10.8	22.9	15.2	10.9	12.9	10.5	9.1
3m	13.3	17.4	14.1	11.7	9.7	5.5	6.3
6m	16.9	17.4	15.0	11.5	5.4	4.2	6.6
1y	21.3	19.0	7.7	10.7	6.9	4.1	4.5
2y	14.0	9.1	9.2	6.6	4.9	3.0	2.9
3y	7.1	5.0	6.4	3.7	3.3	3.1	2.2
4y	6.1	4.9	4.1	3.8	3.1	2.9	2.2
5y	4.2	3.4	3.7	3.6	2.8	2.3	1.6
10y	1.7	2.2	1.2	2.0	0.9	1.4	0.7
15y	0.1	0.7	2.3	1.5	1.8	1.3	1.1
30y	9.0	7.2	6.7	3.9	7.7	8.4	3.7

Source: BofA Global Research

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Exhibit 2: Moves in forwards since the Sep FOMC meeting

1y2y leading the bearish dynamic in fwd space

	1y	2y	3y	5y	7y	10y	30y
1m	11.1	26.2	30.2	29.3	29.2	28.2	24.0
3m	15.4	31.5	32.2	28.2	27.3	28.6	24.3
6m	24.2	31.2	34.1	29.9	28.2	29.8	24.4
1y	39.7	39.7	38.0	31.5	30.7	27.7	26.1
2y	37.3	36.8	31.4	27.7	27.7	28.0	24.2
3y	31.3	28.5	28.0	25.5	25.8	26.0	23.4
4y	22.2	23.8	24.3	27.8	26.0	24.9	23.0
5y	26.4	29.6	31.3	27.8	28.4	22.7	22.8
10y	23.0	24.6	22.7	22.3	22.1	22.1	22.7
15y	21.4	21.4	21.4	21.4	21.4	21.5	18.8
30y	20.4	20.4	20.3	20.4	20.4	20.4	8.9

Source: BofA Global Research

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Exhibit 3: Hike probabilities currently priced in

Two hikes priced in for 2022, 5 hikes in 2023

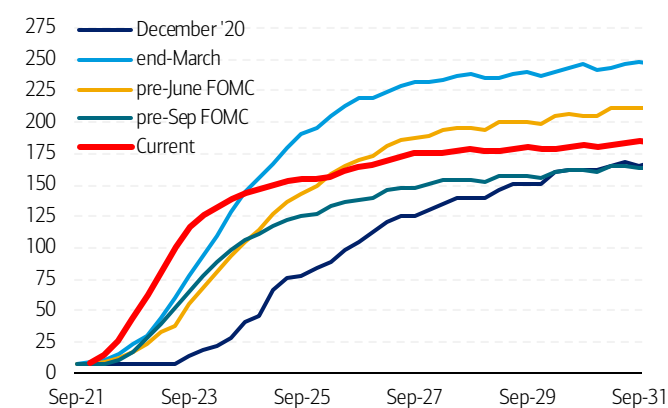
Dates	> 25bp	> 50bp	> 75bp	> 100bp	> 125bp	> 150bp	> 175bp
Dec-21	2%	0%	0%	0%	0%	0%	0%
Mar-22	17%	1%	0%	0%	0%	0%	0%
Jun-22	48%	9%	1%	0%	0%	0%	0%
Sep-22	79%	38%	10%	1%	0%	0%	0%
Dec-22	93%	69%	34%	11%	2%	0%	0%
Mar-23	99%	92%	68%	36%	13%	3%	0%
Jun-23	100%	96%	80%	52%	23%	7%	1%
Sep-23	100%	98%	88%	67%	40%	17%	5%
Dec-23	100%	99%	93%	77%	53%	29%	12%
Mar-24	100%	99%	94%	82%	61%	37%	18%
Jun-24	100%	99%	95%	83%	63%	39%	19%
Sep-24	100%	99%	96%	85%	67%	44%	23%
Dec-24	100%	100%	97%	89%	73%	51%	30%

Source: BofA Global Research

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Exhibit 4: Different stages of repricing of Fed path over the last year

Aggressive frontend repricing since the Sep FOMC meeting



Source: BofA Global Research

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Trade recommendations

We recommended tactical steepeners in 2s10s over the summer, to fade downside breakout of the 110-155bp range we see as fair value with the Fed at the zero lower bound. We argued for conservative targets on the position, around 125-130bp. We hit the target range in the late-Sep/early-Oct steepening move, and faded the highs in the recent frontend led dynamic. We are more agnostic on the curve at these levels.

In a recent note (see [USTs and the 2022 allocation backdrop](#)) we argued for fading the recent flatness of the curve in long dated forwards (4y fwd 2s30s bear steepeners with an inverted -10bp entry level on the curve, which also leans against the recent left side led outperformance of the grid - currently 0bp), positioning for an underperformance of the belly medium term (18m7y costless payer ladders with max upside in the 2.3-2.6% range and 3% downside breakeven - currently 0bp); structural long 5y30y vega positions with entry levels in the 60-62bp range; and fading the recent Fed repricing by buying 1y2y receivers atm+15bp financed by selling 1y2y payers atm+25bp (currently 0bp).



Levels and Recent Moves

Exhibit 5: ATM Normal Volatility Grid

74bp for 1y10y volatility

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	26.7	40.1	50.6	67.0	70.4	74.8	75.6
3M	28.5	45.0	54.4	67.4	69.6	73.2	74.0
6M	37.5	53.3	61.9	69.2	70.3	73.2	72.8
1Y	56.0	67.4	71.1	73.8	74.0	74.2	71.2
2Y	75.6	75.6	75.7	75.9	74.9	74.0	68.8
3Y	78.7	77.9	77.1	76.0	74.7	73.5	66.8
4Y	78.9	78.1	77.2	75.9	74.3	72.6	65.3
5Y	78.5	77.7	76.9	75.5	73.7	71.5	63.7
10Y	69.9	69.2	68.5	67.2	65.7	64.0	56.0
30Y	53.5	53.0	52.4	51.4	50.3	49.0	42.8

Source: BofA Global Research

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Exhibit 6: ATM Volatility Grid - 3m Z-Scores

Left side rich on Z-scores supported by hawkish Fed repricing

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	5.2	5.0	3.9	1.5	0.3	0.3	0.3
3M	4.7	4.7	4.0	1.8	-0.1	-0.1	0.1
6M	4.7	4.1	3.5	2.0	0.2	0.2	0.3
1Y	4.4	3.6	3.2	2.8	2.3	1.5	0.6
2Y	3.4	2.8	2.7	2.5	2.1	1.7	0.9
3Y	2.5	2.4	2.3	2.2	2.1	1.9	1.0
4Y	2.2	2.2	2.3	2.3	2.3	2.4	1.4
5Y	2.2	2.1	2.2	2.3	2.4	2.6	1.4
10Y	2.8	2.9	3.0	2.6	2.3	1.6	0.1
30Y	2.8	3.0	3.0	2.6	2.2	1.4	0.7

Source: BofA Global Research

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Table 1: ATM Normal Volatility Grid - CoW

Left side outperformance vs right

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	10.0	13.6	10.1	4.7	-1.0	-1.1	-1.1
3M	10.7	13.1	9.5	4.5	-1.1	-1.2	-1.2
6M	11.8	11.0	7.3	4.1	-0.8	-0.8	-0.8
1Y	12.7	10.2	6.1	3.2	1.4	-0.2	-0.2
2Y	7.5	3.9	2.5	1.2	0.4	-0.3	-0.3
3Y	2.9	2.1	1.6	0.9	0.6	0.2	0.2
4Y	2.1	1.7	1.4	1.0	0.8	0.6	0.5
5Y	1.0	1.0	1.0	1.0	0.8	0.6	0.5
10Y	0.4	0.4	0.4	0.4	0.4	0.4	0.3
30Y	0.4	0.4	0.4	0.4	0.4	0.4	0.3

Source: BofA Global Research

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Table 2: ATM Straddle Premiums

5.4% straddle premiums for 1y10y

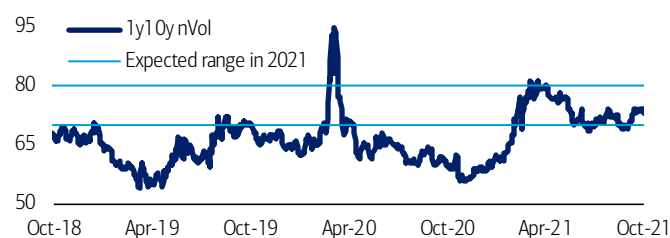
	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.1%	0.2%	0.3%	0.7%	1.1%	1.5%	3.9%
3M	0.1%	0.4%	0.6%	1.3%	1.8%	2.7%	6.8%
6M	0.2%	0.6%	1.0%	1.9%	2.6%	3.8%	9.4%
1Y	0.4%	1.1%	1.7%	2.8%	3.9%	5.4%	12.9%
2Y	0.8%	1.7%	2.5%	4.0%	5.5%	7.5%	17.4%
3Y	1.0%	2.1%	3.0%	4.9%	6.6%	8.9%	20.5%
4Y	1.2%	2.3%	3.4%	5.5%	7.4%	10.0%	22.7%
5Y	1.3%	2.6%	3.8%	6.0%	8.1%	10.9%	24.4%
10Y	1.5%	2.9%	4.3%	6.9%	9.3%	12.6%	28.2%
30Y	1.4%	2.8%	4.1%	6.6%	9.0%	12.3%	28.5%

Source: BofA Global Research

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Exhibit 7: 1y10y normal vol

70-80bp expected range in 2021



Source: BofA Global Research, Bloomberg

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Exhibit 8: 3m10y vs. 3m2y Normal Volatility

Left side vol outperforming right since early August



Source: BofA Global Research, Bloomberg

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Exhibit 9: 1y10y vs. 1m10y Normal Volatility

Term structure of volatility relatively flat

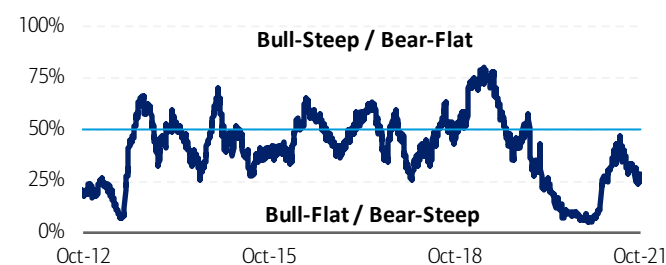


Source: BofA Global Research, Bloomberg

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Exhibit 10: 5s30s curve directionality 31% dictated by belly

Backend regaining significance vs belly since early July



Source: BofA Global Research

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Volatility Grid Relative Value

PCA Z-SCORES

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

Belly looks cheap (5-10y tails) and left side rich...

	1y	2y	3y	5y	7y	10y	30y
3m	3.2	3.8	-0.5	-3.8	-3.3	-3.4	3.0
6m	4.9	0.6	-2.7	-2.1	-4.0	-3.7	5.4
1y	6.6	3.0	-0.4	-1.0	-3.3	-2.7	4.9
2y	0.9	-5.9	-7.0	-0.7	-1.8	-2.2	2.4
5y	-3.1	-2.5	-2.5	-1.8	-0.4	2.1	2.0
10y	2.4	0.2	0.7	1.4	1.9	2.6	4.4

Source: BofA Global Research

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

Belly looks cheap (5-10y tails) and left side rich...

	1y	2y	3y	5y	7y	10y	30y
3m	1.6	0.1	0.5	1.0	-2.6	-2.8	-1.7
6m	2.0	-3.5	-2.4	2.5	-2.5	-3.1	-0.1
1y	4.5	0.7	0.4	-0.1	-0.5	1.3	3.0
2y	2.2	-1.4	-1.6	-1.2	-2.1	-2.5	3.7
5y	-1.0	-2.6	-2.1	0.2	2.1	0.1	1.9
10y	3.4	3.3	3.1	2.5	2.5	1.8	2.2

Source: BofA Global Research

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

Left side richness vs belly persists at 1y horizon

	1y	2y	3y	5y	7y	10y	30y
3m	0.7	-0.8	1.2	-0.8	-1.9	-0.8	0.7
6m	2.4	-6.1	0.3	-1.6	-2.4	-1.8	0.5
1y	0.4	3.2	1.7	-0.3	0.3	0.0	1.9
2y	1.6	-0.9	-0.9	-0.9	0.1	0.6	2.4
5y	0.2	0.3	0.6	0.1	0.3	0.2	0.4
10y	0.2	0.3	0.3	0.5	0.5	0.8	0.5

Source: BofA Global Research

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

Grid left side rich vs flat to cheap right side...

	1y	2y	3y	5y	7y	10y	30y
1m	2.0	1.8	1.7	-1.0	0.8	0.7	-0.6
3m	2.9	3.3	1.4	1.2	0.9	0.2	-1.2
6m	2.4	2.5	1.8	1.3	0.7	0.0	0.4
1y	2.5	2.4	1.8	1.4	1.1	0.9	-0.3
2y	1.8	1.0	1.2	0.9	0.8	1.0	0.1
3y	1.1	-0.3	1.0	0.9	-1.2	1.4	2.6
4y	0.7	0.8	1.3	0.9	-1.1	1.0	1.2
5y	0.5	1.7	0.9	0.2	0.6	0.2	-1.1
10y	0.3	1.0	0.8	0.9	0.1	-0.3	-0.6
15y	0.4	-0.4	-1.7	1.3	-0.4	-0.6	0.5
30y	-1.4	-0.6	-0.9	1.5	2.7	1.1	0.6

Source: BofA Global Research

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

... ULC richness more significant when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	4.9	5.0	3.6	1.8	1.3	1.3	2.1
6m	6.1	4.1	2.7	1.9	1.0	1.0	1.9
1y	6.2	4.1	2.7	2.2	1.5	0.9	2.2
2y	3.4	1.4	1.2	1.6	0.8	0.2	1.9
5y	-1.4	-1.6	-1.4	-0.5	0.6	1.9	2.6
10y	2.2	1.9	2.3	2.6	2.9	3.1	3.5

Source: BofA Global Research

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

... ULC richness more significant when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	2.4	1.7	1.6	1.2	-0.1	-0.1	0.0
6m	2.9	0.8	0.6	1.8	0.0	0.1	0.6
1y	3.5	2.7	2.2	1.6	1.2	1.5	1.3
2y	3.4	1.5	1.5	1.2	0.9	0.5	1.8
5y	1.2	0.7	1.0	1.4	1.7	1.1	1.7
10y	2.9	3.0	2.9	2.5	2.4	1.7	1.8

Source: BofA Global Research

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

... belly cheapness much more obvious on 1y horizon

	1y	2y	3y	5y	7y	10y	30y
3m	1.8	0.5	-1.2	-2.1	-2.5	-1.0	0.6
6m	2.0	-1.1	-2.2	-2.6	-2.7	-1.5	0.2
1y	0.6	-0.4	-2.0	-2.5	-1.9	-0.9	0.6
2y	-1.9	-2.9	-2.9	-2.7	-1.8	-0.7	0.6
5y	-1.8	-1.6	-1.3	-0.9	-0.6	-0.4	0.0
10y	-0.4	-0.3	-0.2	-0.1	0.0	0.3	0.3

Source: BofA Global Research

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

... even as directionality removed

	1y	2y	3y	5y	7y	10y	30y
1m	2.1	1.9	1.6	-1.1	0.9	1.0	-0.6
3m	3.0	3.4	1.2	0.9	0.7	0.6	-1.4
6m	2.9	2.4	2.0	1.0	0.6	0.0	0.1
1y	2.8	2.3	1.7	1.2	0.9	0.8	-0.2
2y	1.8	1.0	1.1	0.8	0.7	1.1	-0.2
3y	1.0	-0.3	1.0	1.0	-0.5	1.4	2.7
4y	0.7	0.9	1.0	1.0	-1.3	1.3	1.3
5y	0.1	1.8	0.7	0.5	0.2	1.1	-0.4
10y	0.5	0.8	1.0	1.1	0.0	-0.4	-1.1
15y	0.0	-0.4	-1.7	1.7	-0.5	-0.5	0.4
30y	-1.2	-0.3	-0.9	1.5	2.5	1.3	0.7

Source: BofA Global Research

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Skew Relative Value

Table 11: Skew 25% delta

Receiver skew RV relatively fair in gamma space

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-2.0	-2.7	-2.8	-2.3	-1.5	0.0	1.3
3M	-3.6	-4.6	-4.5	-3.5	-2.3	-0.5	1.7
6M	-5.7	-6.6	-6.3	-4.6	-3.3	-1.4	1.7
1Y	-9.2	-9.4	-8.3	-5.8	-4.2	-2.1	1.1
2Y	-11.4	-9.4	-7.8	-5.1	-3.7	-1.8	1.1
5Y	-6.2	-5.3	-4.5	-3.3	-2.2	-0.7	1.6
10Y	-1.5	-1.3	-1.0	-0.6	-0.2	0.3	1.7
30Y	1.5	1.7	1.9	2.2	2.4	2.7	4.0

Source: BofA Global Research

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Table 12: Skew 75% delta

Payer skew RV rich on the ULC

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	2.5	3.5	3.8	3.7	3.0	1.8	0.1
3M	4.9	6.4	6.9	6.4	5.5	4.2	1.4
6M	7.6	8.8	8.9	7.4	6.6	5.3	2.4
1Y	11.1	11.9	11.1	8.7	7.6	6.0	2.8
2Y	14.2	12.6	11.1	8.4	7.2	5.6	2.7
5Y	11.6	10.5	9.6	7.8	6.8	5.5	2.8
10Y	6.4	6.1	5.9	5.5	5.1	4.5	2.5
30Y	7.2	6.9	6.7	6.2	5.8	5.3	3.1

Source: BofA Global Research

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Table 13: Breakeven Widths for Costless Receiver Ladders

71bp breakeven width for 1y10y receiver ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	7	10	13	18	19	21	22
3M	12	19	24	31	33	37	39
6M	21	31	37	44	46	50	54
1Y	44	54	59	65	67	71	73
2Y	85	88	91	97	98	101	101
5Y	154	156	156	158	158	158	150
10Y	214	213	212	211	208	205	189

Source: BofA Global Research

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Table 14: Breakeven Widths for Costless Payer Ladders

87bp breakeven width for 1y10y payer ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	9	14	17	21	22	22	22
3M	21	31	36	41	41	42	39
6M	43	54	60	62	61	60	55
1Y	88	100	100	95	92	87	77
2Y	164	154	147	135	128	122	105
5Y	242	232	224	209	199	187	155
10Y	266	262	258	250	242	233	193

Source: BofA Global Research

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

Receiver skew rich for intermediates in left side/belly

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.9	-0.5	-0.1	0.1	-0.1	0.4	0.3
3M	-0.6	0.5	0.3	0.5	0.8	1.1	1.1
6M	-0.7	-0.6	0.4	1.5	0.9	0.7	2.0
1Y	0.1	0.2	0.8	1.0	0.8	-0.4	-0.1
2Y	2.0	1.4	1.7	2.0	1.4	-0.8	-0.9
5Y	2.7	2.7	2.8	2.8	2.2	0.1	-0.3
10Y	-0.2	0.3	-0.5	-1.8	-2.3	-2.6	-2.3

Source: BofA Global Research

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

Payer skew cheap for intermediates in left side/belly

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.1	-0.1	0.5	0.7	0.5	0.4	-0.1
3M	0.9	0.9	0.6	0.2	1.3	0.8	0.4
6M	0.8	1.1	0.6	-0.4	0.0	0.4	-0.1
1Y	0.6	0.3	-0.5	-1.2	-1.0	-0.6	-0.3
2Y	-1.7	-0.4	-0.9	-1.2	-1.2	0.6	0.0
5Y	-1.9	-2.2	-2.3	-2.5	-2.1	0.1	-0.5
10Y	-0.2	-0.7	0.0	0.5	0.2	-0.5	-1.1

Source: BofA Global Research

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

Ratios of payer / receiver breakeven widths broadly above 100%

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	135%	133%	127%	118%	112%	104%	97%
3M	178%	160%	149%	132%	124%	113%	99%
6M	205%	174%	161%	140%	131%	120%	102%
1Y	201%	185%	170%	146%	136%	123%	105%
2Y	192%	175%	162%	140%	131%	120%	104%
5Y	157%	149%	143%	133%	127%	118%	104%
10Y	124%	123%	121%	119%	116%	113%	102%

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 cheap vs receivers on the left side

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.6	-1.5	-1.5	-1.2	-1.4	-1.3	-1.2
3M	-1.5	-1.5	-1.5	-1.1	-1.0	-0.2	-0.9
6M	-1.4	-1.6	-1.5	-1.2	-1.3	-0.6	-1.2
1Y	-1.7	-1.8	-1.8	-1.8	-1.4	0.1	-0.2
2Y	-2.2	-1.9	-2.0	-2.1	-1.9	1.5	0.5
5Y	-0.6	-0.7	-0.7	-0.6	-0.4	0.1	-0.8
10Y	-0.5	-0.4	-0.3	-0.3	-0.2	-0.2	0.1

Source: BofA Global Research

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Conditional Curve Trades

Table 19: 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	-9.3	-12.8	-13.8	-2.2	-2.6	-0.3
6M	-8.7	-11.8	-12.2	-2.2	-2.1	0.3
1Y	-4.6	-5.2	-3.0	-0.3	2.1	2.2
1.5Y	-2.1	-1.5	2.4	0.7	4.6	3.8
2Y	-0.3	1.7	7.3	1.9	7.5	5.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 21: 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	9.3	12.8	13.8	2.2	2.6	0.3
6M	8.7	11.8	12.2	2.2	2.1	-0.3
1Y	4.6	5.2	3.0	0.3	-2.1	-2.2
1.5Y	2.1	1.5	-2.4	-0.7	-4.6	-3.8
2Y	0.3	-1.7	-7.3	-1.9	-7.5	-5.6

Source: BofA Global Research

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Table 23: 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	11.6	14.2	13.8	2.4	2.6	0.3
6M	11.2	13.6	12.4	2.4	2.1	-0.3
1Y	6.0	6.0	3.0	0.3	-2.1	-2.4
1.5Y	2.6	1.7	-2.4	-0.7	-4.6	-4.0
2Y	0.3	-1.9	-7.3	-2.2	-7.7	-5.8

Source: BofA Global Research

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Table 25: Bear Steepener (pickup to forwards for ATM)

Buy longer maturity payer, sell shorter maturity payer

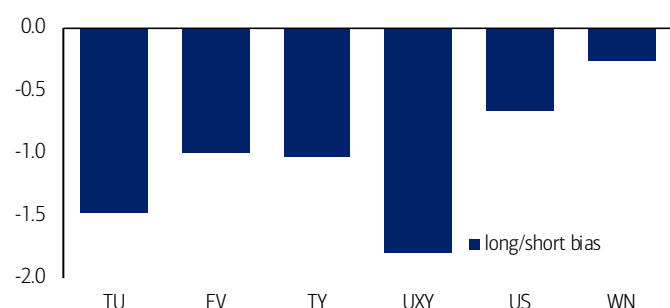
ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-11.6	-14.2	-13.8	-2.4	-2.6	-0.3
6M	-11.2	-13.6	-12.4	-2.4	-2.1	0.3
1Y	-6.0	-6.0	-3.0	-0.3	2.1	2.4
1.5Y	-2.6	-1.7	2.4	0.7	4.6	4.0
2Y	-0.3	1.9	7.3	2.2	7.7	5.8

Source: BofA Global Research

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Chart 1: Analysis of proxies for futures positioning

Back to a short bias across the curve



Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 20: 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	-22.9	-36.6	-42.3	-6.5	-9.3	-2.1
6M	-17.1	-26.1	-31.2	-5.4	-7.7	-1.7
1Y	-8.5	-11.6	-11.0	-2.2	-1.1	1.3
1.5Y	-4.8	-6.0	-3.0	-0.9	2.4	3.2
2Y	-2.2	-1.5	4.0	0.9	6.3	5.6

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 22: 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	22.9	36.6	42.3	6.5	9.3	2.1
6M	17.1	26.1	31.2	5.4	7.7	1.7
1Y	8.5	11.6	11.0	2.2	1.1	-1.3
1.5Y	4.8	6.0	3.0	0.9	-2.4	-3.2
2Y	2.2	1.5	-4.0	-0.9	-6.3	-5.6

Source: BofA Global Research

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Table 24: 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	19.2	20.6	16.7	2.2	0.5	-1.5
6M	14.4	15.7	11.8	1.9	-0.5	-2.1
1Y	5.2	3.4	-1.9	-1.3	-6.0	-4.8
1.5Y	0.7	-2.1	-8.5	-2.6	-8.9	-6.5
2Y	-2.1	-6.0	-13.8	-4.2	-12.2	-8.5

Source: BofA Global Research

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Table 26: Bear Steepener (pickup to forwards for +25bp OTM)

Buy longer maturity payer, sell shorter maturity payer

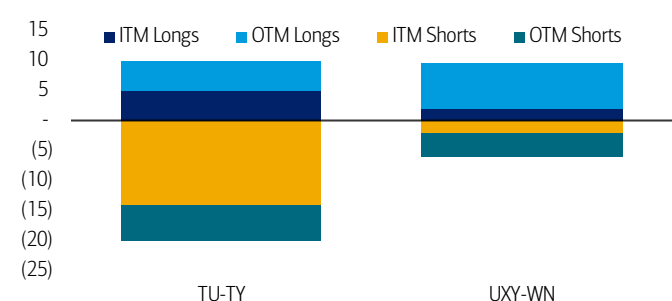
+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-19.2	-20.6	-16.7	-2.2	-0.5	1.5
6M	-14.4	-15.7	-11.8	-1.9	0.5	2.1
1Y	-5.2	-3.4	1.9	1.3	6.0	4.8
1.5Y	-0.7	2.1	8.5	2.6	8.9	6.5
2Y	2.1	6.0	13.8	4.2	12.2	8.5

Source: BofA Global Research

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Chart 2: Proxies for futures positioning across the curve

Frontend ITM longs expose curve to bull steepening



Source: BofA Global Research

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Forward Volatility

Table 27: 6m Forward Volatility

70.7bp for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	41.8	57.2	67.5	69.9	69.1
3m	46.5	61.4	69.1	70.4	68.6
6m	53.7	65.3	70.7	70.9	67.9
1y	58.4	65.6	70.5	70.7	67.2
2y	70.1	70.2	72.2	71.0	65.4
5y	74.5	74.3	72.8	69.6	61.5
10y	68.0	67.4	65.6	62.5	54.3

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 28: 6m Fwd vol as % ATM

95% of ATM for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	157%	142%	101%	93%	91%
3m	163%	136%	103%	96%	93%
6m	143%	122%	102%	97%	93%
1y	104%	97%	95%	95%	94%
2y	93%	93%	95%	96%	95%
5y	95%	96%	96%	97%	97%
10y	97%	97%	98%	98%	97%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 29: 3m Z-Score of 6m Fwd vol % ATM

0.5 Z-Score for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	0.4	-0.1	0.6	0.4	-0.1
3m	1.2	0.7	1.2	1.0	0.2
6m	1.2	1.6	1.4	1.1	0.0
1y	-0.2	0.5	0.6	0.5	0.0
2y	-2.4	-0.5	0.8	0.6	-0.1
5y	2.1	2.1	1.6	0.6	-0.2
10y	0.4	0.2	-0.4	-0.9	-1.0

Source: BofA Global Research

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Table 30: 1y Forward Volatility

69.1bp for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	53.6	61.7	66.4	68.2	66.0
3m	52.7	61.1	66.1	68.2	65.9
6m	59.8	64.2	67.5	68.7	65.6
1y	65.5	65.7	69.3	69.1	64.5
2y	70.0	70.3	70.7	69.6	63.2
5y	73.6	73.5	72.1	68.5	59.9
10y	67.1	66.5	64.7	61.5	53.1

Source: BofA Global Research

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Table 31: 1y Fwd vol as % ATM

93% of ATM for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	201%	154%	99%	91%	87%
3m	185%	136%	98%	93%	89%
6m	159%	120%	98%	94%	90%
1y	117%	98%	94%	93%	91%
2y	93%	93%	93%	94%	92%
5y	94%	95%	96%	96%	94%
10y	96%	96%	96%	96%	95%

Source: BofA Global Research

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Table 32: 3m Z-Score of 1y Fwd vol % ATM

0.3 Z-Score for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	0.2	-0.4	0.3	0.4	-0.1
3m	0.7	-0.1	0.3	0.8	0.2
6m	-1.0	-0.8	0.3	0.8	0.2
1y	-3.2	-4.1	-0.5	0.3	0.1
2y	-3.3	-0.7	0.3	0.6	0.1
5y	1.0	1.2	1.6	0.5	-0.1
10y	0.1	0.0	-0.3	-0.9	-0.7

Source: BofA Global Research

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Table 33: 2y Forward Volatility

68.1bp for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	77.5	71.0	68.5	67.0	61.3
3m	75.2	70.0	68.3	67.3	61.5
6m	76.7	71.7	69.0	67.8	61.3
1y	74.8	71.9	69.6	68.1	61.0
2y	74.1	73.3	71.8	68.8	60.9
5y	73.7	73.2	71.2	66.9	57.4
10y	65.4	64.8	63.2	59.8	51.1

Source: BofA Global Research

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Table 34: 2y Fwd vol as % ATM

92% of ATM for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	290%	177%	102%	90%	81%
3m	264%	156%	101%	92%	83%
6m	204%	134%	100%	93%	84%
1y	134%	107%	94%	92%	86%
2y	98%	97%	95%	93%	89%
5y	94%	94%	94%	94%	90%
10y	94%	94%	94%	94%	91%

Source: BofA Global Research

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Table 35: 3m Z-Score of 2y Fwd vol % ATM

0.7 Z-Score for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	-4.0	-3.3	-0.2	0.3	-0.2
3m	-2.2	-3.0	0.2	0.8	0.2
6m	-3.7	-3.0	0.2	0.9	0.2
1y	-3.3	-2.4	0.0	0.7	0.2
2y	-1.3	0.2	0.8	1.2	0.7
5y	1.1	1.3	1.2	0.0	-0.3
10y	0.1	0.0	-0.1	-0.6	-0.3

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 36: 3y Forward Volatility

69.8bp for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	74.0	74.2	71.1	67.7	60.2
3m	78.7	77.7	73.3	69.1	61.2
6m	77.8	78.1	73.9	69.5	61.3
1y	79.2	78.6	74.7	69.8	61.1
2y	77.6	76.5	74.7	69.1	59.6
5y	72.9	72.2	69.7	65.5	55.3
10y	64.0	63.4	62.1	58.7	49.7

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 37: 3y Fwd vol as % ATM

94% of ATM for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	277%	185%	106%	90%	80%
3m	276%	173%	109%	94%	83%
6m	207%	146%	107%	95%	84%
1y	141%	117%	101%	94%	86%
2y	103%	101%	98%	93%	87%
5y	93%	93%	92%	92%	87%
10y	92%	92%	93%	92%	89%

Source: BofA Global Research

BofA GLOBAL RESEARCH

Table 38: 3m Z-Score of 3y Fwd vol % ATM

1.4 Z-Score for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	-3.8	-2.8	-0.1	0.4	0.0
3m	-3.7	-3.5	0.1	1.0	0.4
6m	-3.9	-3.1	0.5	1.3	0.8
1y	-3.4	-2.1	0.6	1.4	1.2
2y	-1.7	0.0	1.1	1.3	0.9
5y	0.0	0.0	-0.2	-0.8	-0.5
10y	0.0	-0.1	0.1	-0.4	0.1

Source: BofA Global Research

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Ratios implied/delivered

Table 39: Implied vs. Delivered (21 d) Ratio

Ratios > 100% virtually across the grid

	1y	2y	3y	5y	7y	10y	30y
1m	181%	120%	114%	128%	120%	116%	107%
3m	138%	114%	112%	122%	115%	110%	104%
6m	126%	117%	120%	119%	111%	107%	101%
1y	110%	113%	117%	113%	107%	102%	96%
2y	109%	108%	104%	100%	96%	93%	89%

Source: BofA Global Research

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Table 40: Implied vs. Delivered (63 d) Ratio

Ratios > 100% concentrated on left side

	1y	2y	3y	5y	7y	10y	30y
1m	245%	163%	143%	144%	133%	129%	129%
3m	195%	154%	138%	136%	127%	123%	125%
6m	177%	152%	142%	131%	122%	120%	122%
1y	150%	141%	134%	125%	118%	115%	116%
2y	127%	119%	114%	110%	107%	106%	108%

Source: BofA Global Research

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Table 41: 3m Z-Scores for Implied vs. Delivered (21 d) Ratio

Broad fair/cheapness vs 1m history

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

Source: BofA Global Research

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Table 42: 3m Z-Scores for Implied vs. Delivered (63 d) Ratio

Broad richness vs 3m history

	1y	2y	3y	5y	7y	10y	30y
1m	2.6	3.3	3.5	3.3	2.6	2.7	2.5
3m	1.4	2.8	3.8	3.8	2.8	2.9	2.7
6m	1.6	2.8	3.5	3.9	3.3	3.4	3.1
1y	2.6	3.3	3.7	4.1	3.9	3.6	3.4
2y	3.7	3.8	3.8	3.8	3.6	3.3	3.3

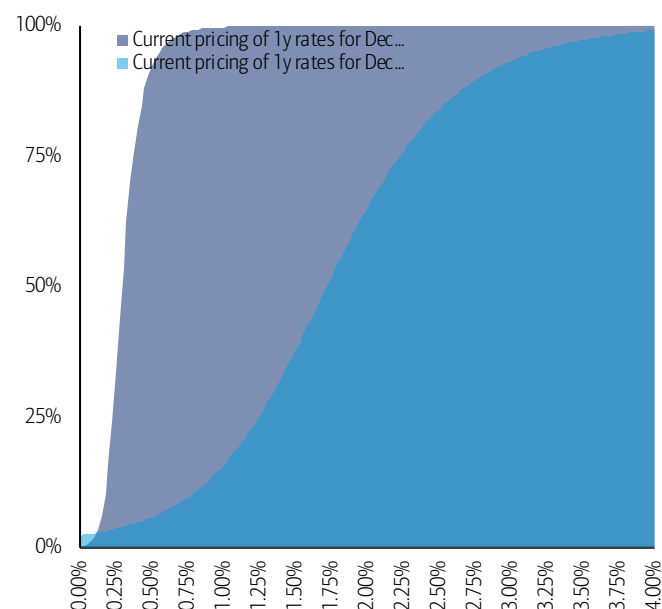
Source: BofA Global Research

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Rates probability distributions

Exhibit 11: CDF for 1y rates at end-2021 and end-2022

1y rate cumulative distribution functions

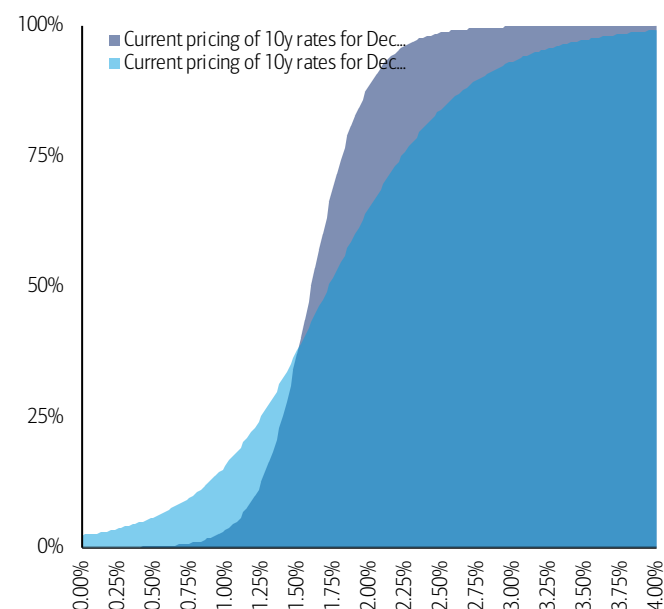


Source: BofA Global Research

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Exhibit 12: CDF for 10y rates at end-2021 and end-2022

10y rate cumulative distribution functions



Source: BofA Global Research

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Trade activity

Exhibit 13: 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	-	-	-	25	-	-	-	-	-	25
1m	-	-	-	-	960	-	660	-	240	1,860
3m	-	-	-	-	240	-	720	-	14	974
6m	-	460	-	-	-	25	220	-	-	705
1y	1,750	200	-	25	-	-	20	-	-	1,995
2y	-	-	-	-	-	-	-	-	-	-
3Y	-	-	-	-	-	-	-	-	-	-
4Y	-	-	-	-	-	-	-	-	-	-
5Y	-	-	-	-	-	-	-	-	100	100
7Y	-	-	-	-	-	-	-	-	-	-
10Y	-	-	-	-	-	-	14	8	240	262
20Y	-	-	-	-	-	-	-	-	-	-
30Y	-	-	-	-	-	-	-	-	-	-
	1,750	660	-	50	1,200	25	1,634	8	594	5,921

Source: BofA Global Research

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Exhibit 15: Receiver volumes over the last week (\$m notional)

Demand for receivers over the last week

Receivers	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	-	-	-	-	-	-	-	-	-	-
1m	-	-	-	-	720	-	270	-	240	1,230
3m	-	-	-	-	-	-	-	-	-	-
6m	-	460	-	-	-	-	-	-	360	820
1y	2,100	200	-	-	-	-	-	-	-	2,300
2y	-	-	-	-	-	-	-	-	-	-
3Y	-	-	-	-	-	-	-	-	-	-
4Y	-	-	-	-	-	-	-	-	-	-
5Y	-	-	-	-	-	-	-	-	220	220
7Y	-	-	-	-	-	-	-	-	-	-
10Y	-	-	-	-	-	-	14	8	240	262
20Y	-	-	-	-	-	-	-	-	-	-
30Y	-	-	-	-	-	-	-	-	-	-
	2,100	660	-	-	720	-	284	8	1,060	4,832

Source: BofA Global Research

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Exhibit 16: Straddle volumes over the last week (\$m notional)

Demand for straddles over the last week

Straddles	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	-	-	-	-	-	-	-	-	-	-
1m	-	-	-	-	-	-	88	-	10	98
3m	-	-	-	-	-	-	-	-	-	-
6m	-	-	-	-	-	-	-	-	-	-
1y	-	-	-	-	-	-	-	-	-	-
2y	-	-	-	-	-	-	-	-	-	-
3Y	-	-	-	-	-	-	-	-	-	-
4Y	-	-	-	-	-	-	-	-	-	-
5Y	-	-	-	-	-	-	-	-	-	-
7Y	-	-	-	-	-	-	-	-	-	-
10Y	-	-	-	-	-	-	-	-	-	-
20Y	-	-	-	-	-	-	-	-	-	-
30Y	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	88	-	10	98

Source: BofA Global Research

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Formosa issuance

Exhibit 17: 2020 Formosa issuance (\$m)

Record issuance year in 2020: 37.5bn in 5y30y

		Underlying										
		1	2	3	4	5	7	10	15	20	25	30
Lockout	1	-	-	-	-	-	-	295	-	-	-	-
	2	-	-	-	-	-	-	50	-	-	-	40
	3	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	20
	5	-	-	-	-	-	-	-	-	-	-	37,533
	7	-	-	-	-	-	-	-	-	-	-	945
	10	-	-	-	-	-	-	-	-	-	-	500
	15	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-
	25	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	2,500

Source: BofA Global Research

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Exhibit 18: 2021 Formosa issuance YTD (\$m)

\$34bn issued in 2021 to date: \$23.3bn in 1H21 & \$12.6bn in 2H21

		Underlying										
		1	2	3	4	5	7	10	15	20	25	30
Lockout	1	-	-	-	-	-	-	958	30	-	-	220
	2	-	-	-	-	-	-	284	45	-	-	-
	3	-	-	-	-	-	-	-	130	-	-	125
	4	-	-	-	-	-	-	-	90	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	18,025
	7	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	920
	15	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-
	25	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	15,000

Source: BofA Global Research

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Exhibit 19: Formosa issuance (\$m) since 2014

Peak issuance concentrated on the 5y30y tenor

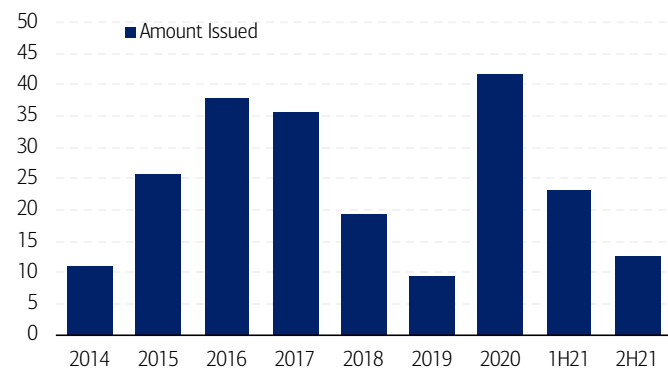
		Underlying										
		1	2	3	4	5	7	10	15	20	25	30
Lockout	1	-	-	-	-	205	-	1,478	472	840	-	18,274
	2	-	-	-	-	-	-	438	45	1,485	-	22,177
	3	-	-	-	-	-	-	-	130	240	225	15,536
	4	-	-	-	-	-	-	-	90	25	275	2,441
	5	-	-	-	-	-	-	-	400	1,277	273	119,457
	7	-	-	-	-	-	-	-	-	-	-	5,624
	10	-	-	-	-	-	-	-	-	-	-	5,021
	15	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-
	25	-	-	-	-	-	-	-	-	-	-	-
	30	-	-	-	-	-	-	-	-	-	-	20,500

Source: BofA Global Research

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Exhibit 19: Total issuance per year since 2014 (\$bn)

2016/17 vintages vs 2020/21 vintages



Source: BofA Global Research

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