

## US Rates Watch

## Vol views – Dislocations galore

## Dislocations galore

The volatility grid is inverted both across expiries (1-3m expiries above intermediate vols virtually across the grid – see Exhibit 1 and Exhibit 5) and underlyings (with left side vol generally flat or higher vs. right side vol – see Exhibit 4). The 1y10y implied volatility has traded recently at c.80-85bp, the top end of the expected '22 range (see [Rates vol going into 2022](#)), and long dated vega has recently reached the highest levels since 2Q20 (despite a likely solid formosa issuance calendar in early '22).

These moves are being driven by significant risks around policy communication at the December FOMC meeting (potential for faster taper, more hawkish dot plot, and QT discussions – the latter significantly underpriced on the curve), and a widening of the range of outcomes for the US economy as omicron risks started to get priced in.

A hawkish shift in Fed communication just as the path of the pandemic become more uncertain only contributed to the notion that the Fed is willing sacrifice growth to contain inflation, leading further pressure on terminal rate expectations, lows in 7y1y OIS not seen since early-'21, and a long bias at the backend of the curve (see Chart 1). This dynamic pushed the 2s10s curve to unprecedented flat levels ahead of a Fed tightening cycle, constraining optionality around the Fed policy path, and potentially putting the transition between mid- and late-cycle dynamics well in the context of the strategic asset allocation horizon for portfolio (c.3y) with significant implications for portfolio construction (see [The curve, the “rock” and the “hard place”](#))

Vol looks rich virtually across the grid rich across the grid (see Table 9), and slightly more so when directionality with forwards is taken into account (see Table 10). The inversions in the term structure of volatility imply relatively cheap levels for forward volatility (see Table 23 and Table 24). However, implied vols still look cheap to 1m delivered vol (see Table 31) in gamma space, illustrated the magnitude of the recent repricing in forwards.

The broad left vs right side inversion allows for a significant pickup to the forwards in conditional bear steepeners (see Exhibit 13) and bull flatteners (see Exhibit 7). Our bias has been towards steepeners in vega space, fading also the inversions in forwards – we recommended 4y fwd 2s30s bear steepeners (see [USTs and the '22 allocation backdrop](#), currently -5bp) and continue to find these types of positions attractive.

We favor fading further hawkish repricing of the Fed at a 1y horizon, but long scenarios for marginally more hawkish repricing of the Fed at a 2y horizon. We like to: [sell 1y2y payers w/ 2% strike \(> 50bp OTM\) and buy 2y2y payer spreads ATM/2% \(c.35bp strike spread\)](#), equal notional and receiving 2.5bp (indicative) on the position. The trade is short vol at inception (the exposure decays w/ higher theta of short leg) w/ carry c.5bp/6m.

Sub-2% levels by end-'22 put the short leg OTM and convert the trade into a 1y2y payer spread for which client received upfront premium. The risk and worst case for the trade is >2% selloff in 2y rates by end-'22, and a rally thereafter. This leaves the short leg exposed to unlimited downside, which may only be partially offset by the upfront premium and max c.35bp of upside in the payer spread if the 2y > 2% by end-'23.

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FOMC – Federal Open Market Committee

ITM – In the money

LRC – Lower right corner

LRC – Lower right corner

OIS – Overnight indexed swap

OTM – Out of the money

QT – Quantitative tightening

ULC – Upper left corner

URC – Upper right corner

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

# Levels and Recent Moves

## Exhibit 1: ATM Normal Volatility Grid

83.2bp for 1y10y volatility

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	64.7	87.7	89.6	90.8	89.1	89.1	88.2
3M	71.7	89.2	89.9	90.3	88.1	88.1	86.4
6M	78.4	87.7	88.6	89.3	86.3	86.3	83.7
1Y	90.5	87.9	87.4	86.9	85.0	83.2	79.4
2Y	92.6	89.0	86.9	84.8	82.6	80.7	75.9
3Y	89.4	86.8	85.1	83.1	80.9	78.8	72.9
4Y	87.0	84.9	83.6	81.6	79.6	77.4	70.4
5Y	84.7	83.0	82.0	80.2	78.3	76.0	68.0
10Y	74.0	72.5	71.6	70.1	68.6	66.7	59.0
30Y	55.0	54.0	53.3	52.1	51.0	49.6	43.9

Source: BofA Global Research

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

Richness across the grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	1.6	1.4	1.5	1.6	1.8	1.9	1.6
3M	1.9	1.5	1.5	1.8	1.9	2.0	1.6
6M	1.7	1.5	1.6	1.8	1.9	2.1	1.7
1Y	1.7	1.4	1.5	1.8	1.8	1.8	1.5
2Y	1.5	1.4	1.6	1.7	1.7	1.7	1.6
3Y	1.5	1.5	1.6	1.8	1.8	1.8	1.8
4Y	1.7	1.6	1.7	1.8	1.9	1.9	1.8
5Y	1.8	1.8	1.8	1.9	2.0	2.2	1.8
10Y	2.5	2.1	2.1	2.2	2.3	2.5	2.3
30Y	2.0	1.5	1.5	1.4	1.5	1.6	1.6

Source: BofA Global Research

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## Table 1: ATM Normal Volatility Grid - CoW

Left side continues to outperform vs right

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	8.7	7.0	5.8	4.9	2.2	2.2	1.4
3M	14.8	10.5	7.7	5.9	3.7	3.7	1.9
6M	13.7	9.8	7.9	6.3	3.7	3.7	2.7
1Y	13.0	6.0	5.1	4.2	2.8	1.6	0.8
2Y	5.7	3.0	2.5	2.1	1.3	0.5	0.1
3Y	2.9	1.5	1.7	1.9	1.2	0.6	0.2
4Y	2.8	2.0	1.9	1.9	1.5	1.1	0.4
5Y	2.8	2.4	2.2	1.9	1.7	1.5	0.6
10Y	2.5	2.1	1.9	1.7	1.6	1.6	1.1
30Y	1.2	0.9	0.8	0.7	0.7	0.6	0.3

Source: BofA Global Research

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## Table 2: ATM Straddle Premiums

6.0% straddle premiums for 1y10y

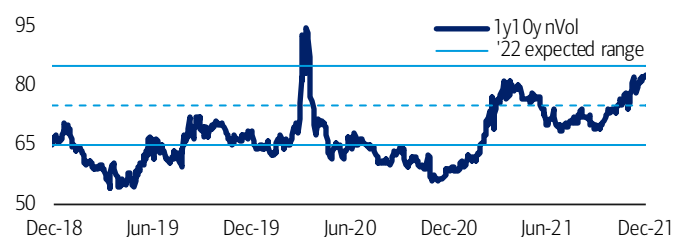
	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.2%	0.4%	0.6%	1.0%	1.4%	1.9%	4.9%
3M	0.3%	0.7%	1.0%	1.7%	2.3%	3.2%	8.1%
6M	0.4%	1.0%	1.5%	2.4%	3.2%	4.5%	11.1%
1Y	0.7%	1.4%	2.0%	3.3%	4.4%	6.0%	14.8%
2Y	1.0%	1.9%	2.8%	4.5%	6.0%	8.2%	19.8%
3Y	1.2%	2.3%	3.3%	5.3%	7.1%	9.6%	23.0%
4Y	1.3%	2.5%	3.7%	5.9%	8.0%	10.8%	25.3%
5Y	1.4%	2.7%	4.0%	6.4%	8.6%	11.6%	27.0%
10Y	1.6%	3.1%	4.6%	7.3%	9.9%	13.4%	31.3%
30Y	1.6%	3.1%	4.5%	7.2%	9.8%	13.5%	32.6%

Source: BofA Global Research

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## Exhibit 3: 1y10y normal vol

65-85bp expected range in '22 (we favor the top half of the range)

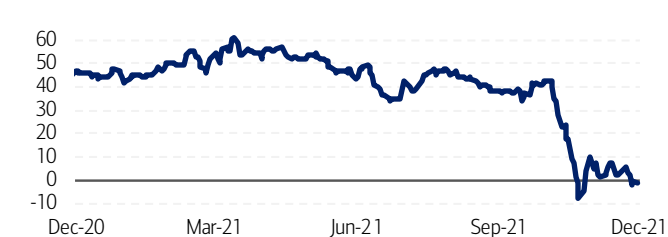


Source: BofA Global Research, Bloomberg

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## Exhibit 4: 3m10y vs. 3m2y Normal Volatility

Left side vol flat to right side vol



Source: BofA Global Research, Bloomberg

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## Exhibit 5: 1y10y vs. 1m10y Normal Volatility

Term structure of volatility back to inverted ahead of policy communication

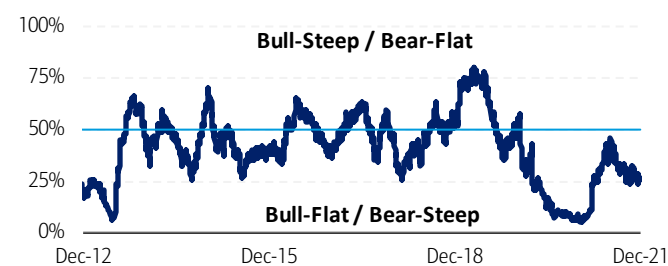


Source: BofA Global Research, Bloomberg

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## Exhibit 6: 5s30s curve directionality 31% dictated by belly

Backend continues to lead vs belly (flattening dynamic)



Source: BofA Global Research

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# Volatility Grid Relative Value

## PCA Z-SCORES

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

2-3y tails fair to cheap, along with 30y tails

	1y	2y	3y	5y	7y	10y	30y
3m	3.9	-3.9	-2.2	-0.2	0.7	1.9	-2.1
6m	2.2	-3.4	-1.6	1.7	1.3	3.6	-0.9
1y	3.2	-3.2	-1.1	2.6	2.2	-0.2	-2.4
2y	0.4	-2.8	-0.3	1.8	-0.2	-0.7	-1.3
5y	3.1	2.2	0.5	2.7	1.3	2.0	0.8
10y	2.6	1.6	1.6	1.7	2.0	2.3	2.3

Source: BofA Global Research

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

2-5y tails mostly fair to cheap, along with 30y tails

	1y	2y	3y	5y	7y	10y	30y
3m	2.4	-1.0	-1.3	0.3	0.9	1.4	-1.8
6m	2.6	-2.7	-0.1	1.8	1.0	1.4	-1.3
1y	1.9	-1.9	-0.5	0.3	-0.1	-0.6	-2.1
2y	-0.7	-2.4	-1.8	-0.8	-1.3	-1.6	-2.0
5y	-1.2	-1.4	-1.3	-0.1	1.7	2.2	-0.2
10y	2.3	1.0	1.1	1.1	1.0	1.4	1.1

Source: BofA Global Research

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

2-5y tails look fair/cheap

	1y	2y	3y	5y	7y	10y	30y
3m	3.1	1.1	-0.1	0.2	0.2	1.7	-1.1
6m	2.8	-2.6	-1.8	0.3	0.3	2.2	1.4
1y	0.9	-3.1	-2.2	-0.7	1.0	1.7	1.1
2y	-1.5	-1.7	-1.6	-0.9	0.4	1.3	1.1
5y	-0.4	-0.1	0.9	1.0	1.3	1.3	1.0
10y	1.3	0.8	0.8	0.7	0.7	0.8	1.0

Source: BofA Global Research

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

Grid left side still rich

	1y	2y	3y	5y	7y	10y	30y
1m	0.9	1.7	2.1	0.2	2.0	2.3	0.0
3m	2.9	3.7	2.6	0.5	1.7	2.3	0.3
6m	3.0	3.0	2.5	1.0	1.3	0.9	1.3
1y	2.9	2.5	2.5	2.4	1.5	1.6	1.1
2y	2.0	1.4	1.5	1.6	1.2	1.7	1.1
3y	1.4	0.2	1.2	1.5	-0.1	1.3	3.4
4y	0.7	-0.4	0.5	1.3	-0.7	1.3	2.0
5y	1.0	2.5	0.0	0.3	0.8	1.1	1.3
10y	1.4	2.1	0.8	1.1	-0.8	-0.2	0.1
15y	0.6	0.5	0.2	3.2	0.4	0.1	1.4
30y	0.2	0.5	-0.6	1.0	2.1	1.4	-1.1

Source: BofA Global Research

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

Richness more significant when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	0.7	-0.9	-0.5	0.9	1.4	1.7	0.5
6m	0.5	-0.8	0.0	1.5	1.5	1.9	0.7
1y	0.7	-0.4	0.5	1.8	1.7	1.2	0.2
2y	0.4	0.1	0.7	1.6	1.0	0.9	0.5
5y	2.0	1.9	1.4	2.1	1.8	2.2	1.3
10y	2.4	1.5	1.6	1.6	1.9	2.1	2.0

Source: BofA Global Research

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

Richness more significant when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	1.9	0.2	0.5	1.2	1.3	1.5	0.5
6m	1.6	0.1	0.6	1.6	1.6	1.9	0.7
1y	1.2	-0.6	0.2	1.8	1.9	1.8	0.4
2y	0.1	0.4	1.3	2.0	1.9	1.7	1.0
5y	2.1	1.9	2.0	2.2	2.4	2.6	1.5
10y	2.6	2.1	2.1	2.1	2.2	2.4	1.5

Source: BofA Global Research

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

Richness more significant when directionality taken into account

	1y	2y	3y	5y	7y	10y	30y
3m	2.9	1.9	1.7	1.4	1.2	1.9	1.4
6m	2.8	1.0	1.1	1.6	1.4	2.1	1.6
1y	2.7	0.1	0.4	1.3	1.7	1.9	1.4
2y	0.6	0.4	0.6	1.1	1.5	1.7	1.4
5y	1.2	1.3	1.7	1.6	1.6	1.6	1.3
10y	1.5	1.2	1.1	1.1	1.0	1.0	1.2

Source: BofA Global Research

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

...and even as directionality removed

	1y	2y	3y	5y	7y	10y	30y
1m	0.8	1.9	2.3	0.3	1.9	2.2	0.0
3m	3.0	3.8	2.5	0.6	1.4	2.2	0.3
6m	3.2	2.9	2.5	1.2	1.2	0.8	1.5
1y	2.9	2.6	2.5	2.3	2.0	1.5	1.2
2y	2.0	1.4	1.6	1.6	1.3	1.9	1.5
3y	1.4	0.1	1.1	1.6	-0.1	1.7	3.3
4y	0.8	-0.2	0.6	1.4	-0.6	1.4	2.3
5y	1.0	2.8	-0.3	0.2	0.6	1.2	1.5
10y	1.5	1.6	0.7	1.3	-1.1	-0.5	-0.1
15y	0.4	0.6	-0.1	3.1	1.4	-0.2	1.8
30y	0.2	0.1	-0.7	1.1	2.0	2.1	-0.8

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	-3.4	-4.5	-3.9	-3.0	-2.1	-0.9	0.9
3M	-6.2	-6.5	-5.6	-4.2	-2.7	-0.9	1.7
6M	-7.8	-7.3	-6.4	-5.0	-3.5	-1.6	1.9
1Y	-9.9	-8.3	-7.4	-5.9	-4.4	-2.4	1.1
2Y	-11.4	-9.3	-7.8	-5.3	-4.0	-2.3	0.8
5Y	-7.0	-5.9	-5.1	-3.6	-2.7	-1.5	1.0
10Y	-2.9	-2.5	-2.2	-1.6	-1.1	-0.6	0.8
30Y	0.5	0.8	1.0	1.3	1.5	1.7	3.3

Source: BofA Global Research

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**Table 12: Skew 75% delta**

Payer skew RV shows some richness in longer expiries on right side

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	4.9	6.3	5.7	4.7	3.9	2.8	0.6
3M	10.3	10.8	9.8	8.0	6.7	5.0	1.7
6M	12.8	11.6	10.6	8.7	7.5	6.0	2.5
1Y	13.9	12.4	11.3	9.4	8.2	6.5	3.0
2Y	14.8	12.8	11.3	8.8	7.7	6.2	3.2
5Y	10.5	9.6	9.0	7.8	7.0	6.0	3.2
10Y	7.0	6.6	6.3	5.8	5.4	4.9	2.9
30Y	7.5	7.1	6.9	6.4	6.0	5.5	3.3

Source: BofA Global Research

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**Table 13: Breakeven Widths for Costless Receiver Ladders**

80bp breakeven width for 1y10y receiver ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	18	24	25	26	26	26	27
3M	31	39	41	42	42	44	45
6M	47	54	56	58	57	59	62
1Y	76	76	77	78	79	80	82
2Y	109	107	107	109	109	110	110
5Y	167	167	167	168	167	166	158
10Y	222	219	218	216	213	210	193

Source: BofA Global Research

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**Table 14: Breakeven Widths for Costless Payer Ladders**

98bp breakeven width for 1y10y payer ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	23	30	31	30	29	29	27
3M	49	57	56	54	51	50	45
6M	80	82	81	77	73	71	63
1Y	127	119	114	108	103	98	86
2Y	186	172	163	149	142	134	116
5Y	246	237	231	219	210	199	167
10Y	283	276	271	262	254	244	205

Source: BofA Global Research

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

Receiver skew still fair/rich on left side, fair/cheap elsewhere

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.2	0.6	0.4	0.8	0.1	0.2	0.3
3M	0.2	0.0	0.7	-1.4	-1.8	-1.9	-2.3
6M	0.5	0.6	1.2	0.4	0.1	0.2	0.2
1Y	-0.3	0.3	0.1	-0.4	-0.4	-0.9	-1.7
2Y	-0.6	-1.5	-1.6	-1.4	-1.5	-1.0	-1.1
5Y	-1.9	-1.9	-1.8	-1.6	-1.7	-2.8	-1.0
10Y	-1.4	-1.3	-1.1	-1.0	-0.7	-0.4	-1.2

Source: BofA Global Research

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

Payer skew richness mostly in longer expiries, particularly on left/belly

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

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 above 100%

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	128%	124%	122%	118%	114%	109%	100%
3M	156%	145%	139%	128%	122%	114%	100%
6M	169%	152%	145%	134%	128%	120%	102%
1Y	166%	157%	149%	138%	132%	122%	105%
2Y	171%	160%	152%	137%	131%	122%	105%
5Y	147%	142%	138%	131%	126%	120%	106%
10Y	128%	126%	124%	122%	119%	116%	106%

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	-1.8	-1.9	-1.9	-0.7	1.0	1.8	1.4
3M	-2.6	-2.0	-2.0	-1.7	-1.8	2.8	0.2
6M	-2.3	-1.8	-1.8	-1.2	-1.2	0.9	0.1
1Y	-1.7	-1.7	-1.7	-1.2	-1.3	-0.4	-0.2
2Y	-1.0	-1.0	-0.9	-0.6	0.0	2.2	1.3
5Y	-0.7	-0.7	-0.6	-0.4	0.0	2.5	1.7
10Y	2.4	2.2	2.2	2.2	2.3	2.3	2.4

Source: BofA Global Research

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# Conditional Curve Trades

## Exhibit 7: 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	0.1	0.9	1.3	0.9	1.3	0.3
6M	0.3	1.7	2.6	1.3	2.4	0.9
1Y	1.7	4.0	6.3	2.4	4.8	2.2
1.5Y	3.8	7.1	10.6	3.0	6.5	3.4
2Y	4.8	8.5	13.4	3.8	8.7	4.8

Source: BofA Global Research

## Exhibit 9: 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	-0.1	-0.9	-1.3	-0.9	-1.3	-0.3
6M	-0.3	-1.7	-2.6	-1.3	-2.4	-0.9
1Y	-1.7	-4.0	-6.3	-2.4	-4.8	-2.2
1.5Y	-3.8	-7.1	-10.6	-3.0	-6.5	-3.4
2Y	-4.8	-8.5	-13.4	-3.8	-8.7	-4.8

Source: BofA Global Research

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## Exhibit 11: 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	0.5	-0.3	-1.1	-0.9	-1.5	-0.7
6M	1.1	-0.7	-2.2	-50.1	-50.1	-1.5
1Y	-50.1	-4.8	-6.5	-4.8	-5.8	-1.5
1.5Y	-3.8	-7.5	-11.0	-4.0	-7.7	-4.2
2Y	-5.2	-9.5	-14.2	-4.8	-9.7	-5.4

Source: BofA Global Research

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## Exhibit 13: Bear Steepener (pickup to forwards for ATM)

Buy longer maturity payer, sell shorter maturity payer

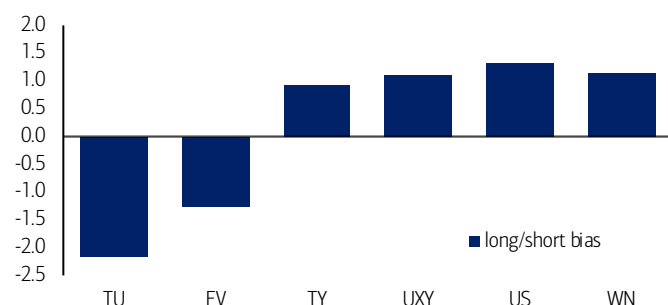
ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-0.5	0.5	1.1	0.9	1.5	0.7
6M	-1.1	0.9	2.2	1.9	3.0	1.5
1Y	0.9	4.0	6.5	3.2	5.8	3.0
1.5Y	3.8	7.5	11.0	4.0	7.7	4.2
2Y	5.2	9.5	14.2	4.8	9.7	5.4

Source: BofA Global Research

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## Chart 1: Analysis of proxies for futures positioning

Short bias still significant at the frontend of the curve



Source: BofA Global Research

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## Exhibit 8: 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	-1.9	-2.2	-2.8	-0.3	-0.7	-0.3
6M	-2.2	-1.7	-1.5	0.9	1.1	0.3
1Y	-0.1	2.1	4.2	2.2	4.4	2.1
1.5Y	2.4	5.6	9.3	3.0	6.5	3.4
2Y	3.6	7.7	12.8	4.0	8.9	5.0

Source: BofA Global Research

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## Exhibit 10: 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	1.9	2.2	2.8	0.3	0.7	0.3
6M	2.2	1.7	1.5	-0.9	-1.1	-0.3
1Y	0.1	-2.1	-4.2	-2.2	-4.4	-2.1
1.5Y	-2.4	-5.6	-9.3	-3.0	-6.5	-3.4
2Y	-3.6	-7.7	-12.8	-4.0	-8.9	-5.0

Source: BofA Global Research

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## Exhibit 12: 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	-0.9	-3.6	-6.0	-2.8	-5.4	-2.8
6M	-0.1	-4.0	-7.3	-3.8	-7.1	-3.8
1Y	-2.4	-7.7	-12.2	-5.0	-10.3	-5.4
1.5Y	-6.3	-12.2	-17.3	-3.0	-12.4	-6.7
2Y	-7.9	-14.0	-20.4	-6.2	-14.0	-7.9

Source: BofA Global Research

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

Buy longer maturity payer, sell shorter maturity payer

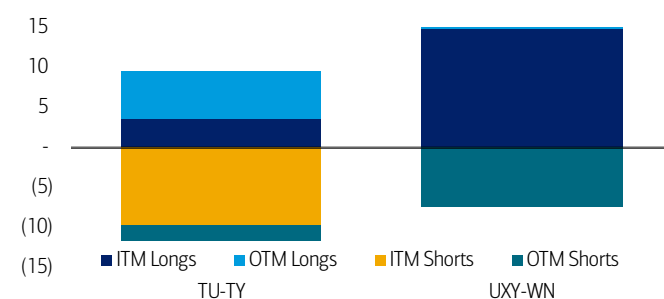
+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	0.9	3.6	6.0	2.8	5.4	2.8
6M	0.1	4.0	7.3	3.8	7.1	3.8
1Y	2.4	7.7	12.2	5.4	10.3	5.4
1.5Y	6.3	12.0	17.3	6.2	12.2	6.7
2Y	7.9	14.0	20.4	6.9	14.0	7.9

Source: BofA Global Research

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## Chart 2: Proxies for futures positioning across the curve

Backend OTM short expose curve to bull flattening



Source: BofA Global Research

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# Forward Volatility

**Table 19: 6m Forward Volatility**

77.0bp for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	76.5	76.1	81.5	78.7	76.1
3m	80.3	75.9	79.9	77.1	74.3
6m	86.9	80.2	80.4	77.1	73.9
1y	85.5	83.3	80.3	77.0	73.4
2y	85.4	81.7	79.4	75.5	70.8
5y	80.8	79.7	77.1	73.2	64.9
10y	71.7	70.3	68.0	64.7	56.9

Source: BofA Global Research

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**Table 20: 6m Fwd vol as % ATM**

93% of ATM for 6m fwd 1y10y

	1y	2y	5y	10y	30y
1m	118%	87%	90%	88%	86%
3m	112%	85%	88%	87%	86%
6m	111%	91%	90%	89%	88%
1y	95%	95%	92%	93%	92%
2y	92%	92%	94%	93%	93%
5y	95%	96%	96%	96%	95%
10y	97%	97%	97%	97%	96%

Source: BofA Global Research

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

-1.5 Z-Score for 6m fwd 1y10y

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

Source: BofA Global Research

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**Table 22: 1y Forward Volatility**

74.5bp for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	85.1	83.4	76.9	74.4	71.7
3m	85.5	84.7	77.5	75.0	72.4
6m	90.8	87.3	78.6	75.5	72.3
1y	94.0	85.8	78.0	74.5	70.6
2y	83.7	79.6	76.7	73.1	68.0
5y	79.4	78.1	75.9	71.8	63.0
10y	70.6	69.2	66.9	63.5	55.4

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	131%	95%	85%	84%	81%
3m	119%	95%	86%	85%	84%
6m	116%	100%	88%	87%	86%
1y	104%	98%	90%	90%	89%
2y	90%	89%	91%	91%	90%
5y	94%	94%	95%	94%	93%
10y	95%	95%	96%	95%	94%

Source: BofA Global Research

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

-0.9 Z-Score for 1y fwd 1y10y

	1y	2y	5y	10y	30y
1m	-0.9	-1.0	-1.2	-1.6	-1.4
3m	-1.0	-1.1	-1.1	-1.6	-1.1
6m	-1.1	-1.1	-1.2	-1.5	-1.0
1y	-0.9	-0.7	-0.9	-0.9	-0.4
2y	-1.2	-0.9	-0.6	-0.6	-0.4
5y	1.0	0.9	0.6	-0.3	-0.5
10y	-0.4	-0.7	-0.7	-0.7	-0.6

Source: BofA Global Research

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**Table 25: 2y Forward Volatility**

71.2bp for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	97.5	88.8	77.7	72.3	67.1
3m	96.5	86.2	76.3	71.3	66.5
6m	91.9	83.6	76.1	71.2	65.8
1y	87.4	81.3	76.0	71.2	65.0
2y	83.5	79.9	77.0	72.2	64.0
5y	78.4	77.0	74.3	69.6	59.7
10y	68.8	67.3	65.1	61.5	52.9

Source: BofA Global Research

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**Table 26: 2y Fwd vol as % ATM**

86% of ATM for 2y fwd 1y10y

	1y	2y	5y	10y	30y
1m	151%	101%	85%	81%	76%
3m	135%	97%	84%	81%	77%
6m	117%	95%	85%	82%	79%
1y	97%	93%	87%	86%	82%
2y	90%	90%	91%	89%	84%
5y	93%	93%	93%	92%	88%
10y	93%	93%	93%	92%	90%

Source: BofA Global Research

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

-0.6 Z-Score for 2y fwd 1y10y

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

Source: BofA Global Research

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**Table 28: 3y Forward Volatility**

73.8bp for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	85.4	83.6	78.8	73.4	65.1
3m	87.5	83.5	78.1	73.1	64.5
6m	88.0	84.2	79.0	73.7	64.2
1y	89.5	84.1	79.1	73.8	63.5
2y	82.7	80.6	78.6	73.1	61.5
5y	77.5	76.0	72.9	68.1	57.2
10y	67.2	65.6	63.6	59.9	50.9

Source: BofA Global Research

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**Table 29: 3y Fwd vol as % ATM**

89% of ATM for 3y fwd 1y10y

	1y	2y	5y	10y	30y
1m	132%	95%	87%	82%	74%
3m	122%	94%	86%	83%	75%
6m	112%	96%	88%	85%	77%
1y	99%	96%	91%	89%	80%
2y	89%	91%	93%	91%	81%
5y	92%	92%	91%	90%	84%
10y	91%	90%	91%	90%	86%

Source: BofA Global Research

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

-0.3 Z-Score for 3y fwd 1y10y

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

Source: BofA Global Research

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## Ratios implied/delivered

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

Ratios &lt; 100% in virtually across the grid except for the extreme ULC

	1y	2y	3y	5y	7y	10y	30y
1m	127%	103%	93%	84%	80%	79%	85%
3m	113%	96%	88%	81%	78%	78%	82%
6m	91%	83%	80%	76%	74%	74%	79%
1y	77%	73%	71%	70%	69%	69%	74%
2y	73%	69%	66%	66%	65%	66%	70%

Source: BofA Global Research

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

ULC and gamma still show ratios &gt; 100% concentrated on left side

	1y	2y	3y	5y	7y	10y	30y
1m	191%	148%	131%	120%	112%	107%	107%
3m	167%	137%	124%	116%	108%	104%	104%
6m	132%	117%	113%	109%	102%	99%	100%
1y	109%	102%	101%	99%	95%	92%	93%
2y	100%	95%	91%	88%	86%	85%	86%

Source: BofA Global Research

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

Broad cheapness vs 1m history ...

	1y	2y	3y	5y	7y	10y	30y
1m	-1.1	-1.2	-1.4	-1.8	-2.0	-2.0	-1.9
3m	-0.9	-1.0	-1.2	-1.7	-1.9	-1.9	-1.8
6m	-1.0	-1.2	-1.4	-1.8	-1.9	-1.9	-1.8
1y	-1.0	-1.3	-1.6	-1.9	-2.0	-2.0	-1.8
2y	-1.4	-1.8	-1.9	-2.0	-2.1	-2.0	-1.7

Source: BofA Global Research

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

... and 3m history

	1y	2y	3y	5y	7y	10y	30y
1m	-0.5	-0.4	-0.3	-0.7	-0.9	-0.9	-0.7
3m	-0.7	-0.5	-0.4	-0.7	-1.0	-1.0	-0.9
6m	-1.1	-0.9	-0.8	-0.8	-1.1	-1.1	-1.0
1y	-1.0	-1.0	-1.1	-1.0	-1.1	-1.3	-1.3
2y	-0.7	-1.0	-1.1	-1.2	-1.2	-1.4	-1.4

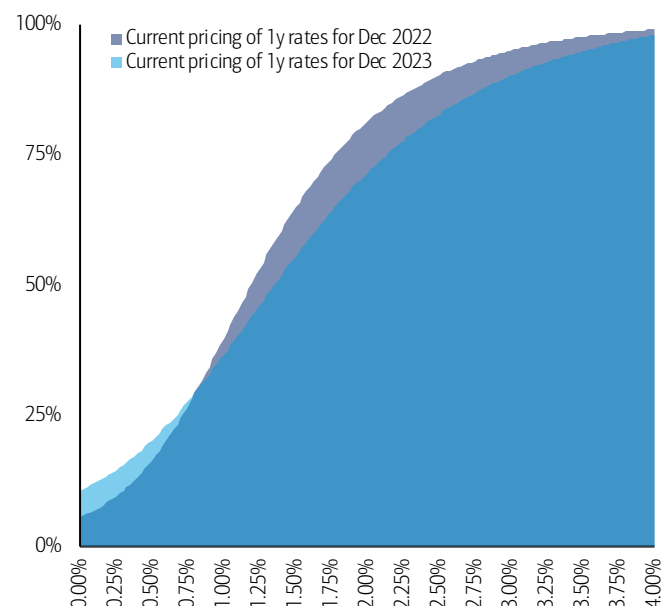
Source: BofA Global Research

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## Rates probability distributions

**Exhibit 15: CDF for 1y rates at end-2022 and end-2023**

1y rate cumulative distribution functions

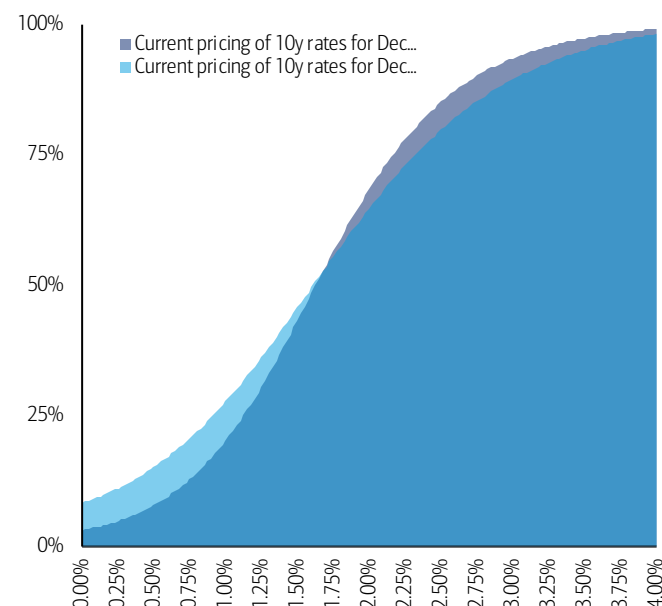


Source: BofA Global Research

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**Exhibit 16: 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 17: Payer volumes over the last week (\$m notional)

Demand for payers over the last week

Pay	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m					650	75	646		62	1,433
1m	2,197	300	240		1,152	45	5,429	635	1,241	11,239
3m	1,100	1,880			617		4,900		170	8,667
6m	500	920			1,012		1,144	880	2,115	6,571
1y	1,200	1,670			610		1,490		340	5,310
2y							1,152	726	749	2,627
3Y	300			55	770		50	200	930	2,305
4Y		46					52		152	250
5Y					3,520		405		847	4,772
7Y					1,200		270	241		1,711
10Y							625	95	400	1,120
20Y					200					200
30Y										
	5,297	4,816	240	55	9,731	120	16,162	2,777	7,006	46,204

Source: BofA Global Research; SDR; Bloomberg

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## Exhibit 18: Receiver volumes over the last week (\$m notional)

Demand for receivers over the last week

Rec	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m		128	122	50	425	75	1,206		80	2,086
1m	2,100	4,809	745		1,248		2,809	277	1,389	13,377
3m	1,100	250			522		2,821		293	4,986
6m	3,200		1,215		179		4,194		2,092	10,880
1y	4,950	2,480					1,390		120	8,940
2y		80	55				436		1,485	2,056
3Y		850		55	136					1,041
4Y							52	25	52	129
5Y					515		375		386	1,276
7Y					1,200		170	141		1,511
10Y					720		1,139	455	522	2,836
20Y										
30Y										
	11,350	8,597	2,137	105	4,945	75	14,592	898	6,419	49,118

Source: BofA Global Research; SDR; Bloomberg

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

Demand for straddles over the last week

Str	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m							250			250
1m					600		2,259		234	3,093
3m					680		1,906		260	2,846
6m	700	1,660	240		300		357	50	333	3,640
1y	6,750	860	400		100		1,720	50	215	10,095
2y	1,250	1,630			300		1,255	75	85	4,595
3Y	2,350	100			600		520		133	3,703
4Y									3	3
5Y							1,182		220	1,402
7Y			240					50		290
10Y							1,120	50		1,170
20Y							50			50
30Y										
	11,050	4,250	880		2,580		10,619	275	1,483	31,137

Source: BofA Global Research; SDR; Bloomberg

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# Formosa issuance

## Exhibit 21: 2020 Formosa issuance (\$m)

Record issuance year in 2020: 37.5bn in 5y30y

	1y	2y	3y	4y	5y	7y	10y	15y	20y	25y	30y
1y							958	30			220
2y							284	45			
3y								130			125
4y								90			
5y									50		19,455
7y											
10y											920
15y											
20y											
25y											
30y											15,000

Source: BofA Global Research

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## Exhibit 22: 2021 Formosa issuance YTD (\$m)

\$37.3bn issued in 2021 to date: \$23.3bn in 1H21 & \$14.0bn in 2H21

	1y	2y	3y	4y	5y	7y	10y	15y	20y	25y	30y
1y							958	30			220
2y							284	45			
3y								130			125
4y								90			
5y									50		19,455
7y											
10y											920
15y											
20y											
25y											
30y											15,000

Source: BofA Global Research

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## Exhibit 23: Formosa issuance (\$m) since 2014

Peak issuance concentrated on the 5y30y tenor

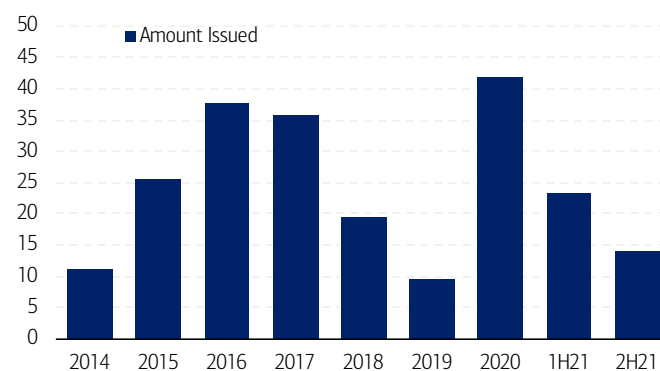
	1y	2y	3y	4y	5y	7y	10y	15y	20y	25y	30y
1y					205		1,478	472	840		18,274
2y							438	45	1,485		22,177
3y								130	240	225	15,536
4y								90	25	275	2,441
5y								400	1,327	273	120,887
7y											5,624
10y											5,021
15y											
20y											
25y											
30y											20,500

Source: BofA Global Research

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## Exhibit 23: Total issuance per year since 2014 (\$bn)

2016/17 vintages vs 2020/21 vintages



Source: BofA Global Research

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# Disclosures

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