

US Rates Watch

Vol Views

Views and flows

Elections and stimulus talks continue to drive the broader dynamic of rates and volatility. With the gap in polls persisting, the risk of a contested election and constitutional crisis scenarios starts to become more remote, and it is not surprising in this context to see right side volatility under some downwards pressure last week (Table 3).

Structurally, however, we continue to believe that the asymmetry of outcomes in rates space tilted to the upside and the recent Fed policy shift towards FAIT have significant implications for the volatility grid, including:

▣ A changing directionality between volatility and yields, shifting away from the recent dynamic where meaningful pickups in vol were mostly driven by risk-off moves

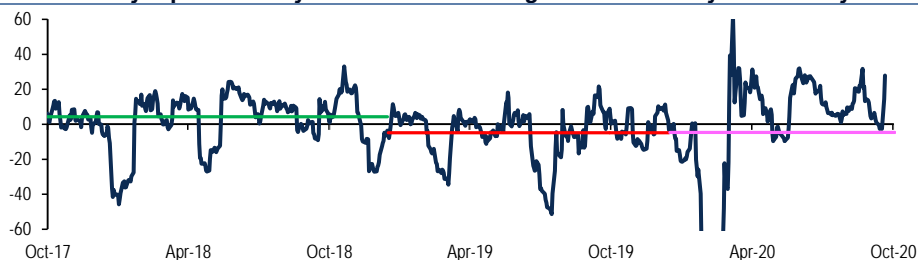
▣ The support for intermediate expiries in the right side of the grid (see [here](#)) and the attractiveness of long intermediate vega positions which are likely to continue to benefit from the rollup in 30y tails;

▣ And persistent support for payer over receiver skew.

On the latter in particular, the rates outlook asymmetry and FAIT are compounded by the state of valuations across asset classes. Risk-on is severely underpriced in rates space, but priced in to a significant extent in risky asset valuations. This suggests that risky assets offer better options for risk-off tail hedges, while rates at the backend of the curve and right side volatility are likely favored to express risk-on tail hedges. This lends further support to the richness of payer over receiver skew near/medium-term.

Directionally therefore we continue to favor bearish steepeners or proxies (for example cap spreads - see [here](#)) in the 5s30s sector of the curve, with expiries around 9m-1y.

Chart 1: 1m10y implied volatility vs. 1m forwards looking delivered volatility of the 1m10y rate



Source: BofA Global Research

Relative value

Volatility was down broadly across the grid last week (Table 3) as election risks continue to fade and rates stayed contained in the 50-80bp range for 10yT that is consistent with the a Fed at ZLB and neutral rate expectations anchored around 0% real (see [here](#)). On Z-scores (Table 12) the only sector where we see some richness is the LRC. Implied to delivered ratios look slightly rich on Z-scores in 1m expiries, supported by the inclusion of election event risk at that horizon (see Chart 1), but look relatively fair elsewhere for both for 1m and 3m delivered windows (Table 46 and Table 47).

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12201372

Timestamp: 19 October 2020 11:10AM EDT

19 October 2020

Rates Research
United States

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

Sphia Salim
Rates Strategist
MLI (UK)
sphia.salim@bofa.com

US Rates Research
BofAS
+1 646 855 8846

For a list of all the open and closed trades over the past 12 months, see latest [Global Rates Weekly](#).

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Payer skew looks rich virtually across the grid when directionality with fwds is taken into account (Table 18). Relative to receiver skew that richness is particularly evident for short and intermediate expiries (Table 20).

Conditional bull steepeners and bear flatteners continue to pick meaningfully to the forwards (Table 23 and Table 25). As we noted above, our preference has been skewed to bear-steepeners medium term (1y horizon, see [here](#)) to position for the repricing of U/V shape scenarios, but structured in a way that reduces the giveup to the forwards (by selling some upside)

Forward vol continues to show ratios to ATM above 100% on the left side of the grid but still relatively fair on the right side (Table 33), although Z-scores indicate some richening vs. recent levels (Table 34).

Trade recommendations

Our focus in recent publications has been towards:

- Hedging scenarios of U/V-shape repricing medium term (around 1y expiries, thought payer spreads, conditional steepeners and cap spreads as we argued in [Paths to higher yields medium term](#) and [here](#);
- Protecting portfolios for downside risks near-term generally through bull flatteners, and receiver ladders with expiries around 3-6m expiries which generally are implicitly short negative rate scenarios (as in [Hedge a summer turmoil scenario](#) or [A likely floor for the curve under YCC](#)). While the adoption of negative interest rate policy by the Fed is not our base scenario, we believe it is worth protecting for. We favor receiver spreads in intermediate expiries on the left side of the grid financed by selling payers (as in [NIRP, unlikely but worth protecting for](#)).

In longer-dated vega, virtually all the Formosa bonds that could be called in 2020 have been called. Issuance levels YTD certainly reflect these high call volumes (Chart 11) with most issuers doing replacement trades, but to some extent the pressure this issuance generally creates on the grid has been offset by Bermudan hedging flows and appetite for forward vol positions.

We see limited potential for long-dated vega positions to act as a risk-off hedge in a range bound yield environment under a historically flat curve. However, given the structural support for intermediate expiries noted above, we believe those structural long vega positions around the 5y30y tenor with positive vol carry start to make sense in portfolios (see [here](#)). Significantly, we see potential call volumes in 2021 of the order of \$15bn maximum, materially lower than what was realized in 2020.



Levels and Recent Moves

Table 1: ATM Normal Volatility Grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	19.0	20.5	25.1	43.6	55.7	71.4	92.9
3M	17.6	19.2	23.0	38.2	47.7	61.1	75.8
6M	16.7	19.5	23.3	38.8	48.7	60.1	71.8
1Y	18.2	22.6	28.2	41.3	51.0	59.8	69.7
2Y	27.3	32.3	36.7	46.8	53.8	60.1	65.8
3Y	37.3	41.0	44.2	51.9	56.4	61.0	63.8
4Y	45.8	48.5	50.5	55.7	58.5	61.6	62.2
5Y	52.3	53.3	54.6	58.6	60.0	61.7	61.1
10Y	61.6	61.6	61.5	61.3	61.1	61.0	56.4
30Y	52.1	51.9	51.6	50.9	50.5	50.2	45.6

Source: BofA Global Research

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

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	1.4	1.3	0.9	2.2	1.9	2.2	2.0
3M	-0.7	-0.6	-0.8	-0.1	-0.7	-0.3	-0.6
6M	-1.1	-0.9	-1.0	-0.5	-1.2	-0.9	-1.1
1Y	-1.4	-1.3	-1.3	-1.1	-1.2	-1.4	-1.1
2Y	-1.4	-1.5	-1.5	-1.6	-2.0	-2.3	-2.5
3Y	-1.5	-1.5	-1.6	-1.8	-2.2	-2.5	-2.8
4Y	-1.6	-1.8	-1.8	-2.0	-2.3	-2.4	-3.0
5Y	-1.7	-2.1	-2.1	-1.9	-2.1	-2.2	-2.8
10Y	-1.6	-1.8	-1.9	-1.8	-1.8	-1.6	-2.0
30Y	-0.4	-0.5	-0.9	-1.4	-1.6	-1.6	-2.4

Source: BofA Global Research

Table 3: ATM Normal Volatility Grid - CoW

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.9	-0.9	-0.6	0.5	0.1	0.2	-1.9
3M	-1.1	-1.0	-0.9	-0.4	-2.0	-2.6	-3.6
6M	-1.1	-0.9	-0.8	-0.5	-1.8	-2.2	-3.3
1Y	-0.9	-1.3	-1.0	-0.4	-1.0	-1.5	-2.1
2Y	-1.0	-1.2	-1.1	-0.9	-1.3	-1.6	-2.1
3Y	-1.1	-1.4	-1.3	-1.1	-1.2	-1.3	-1.7
4Y	-1.0	-1.3	-1.1	-0.8	-1.0	-1.2	-1.6
5Y	-0.7	-1.0	-1.0	-0.8	-1.0	-1.2	-1.5
10Y	-0.6	-0.6	-0.6	-0.6	-0.7	-0.9	-1.1
30Y	-0.6	-0.6	-0.6	-0.6	-0.7	-0.8	-1.0

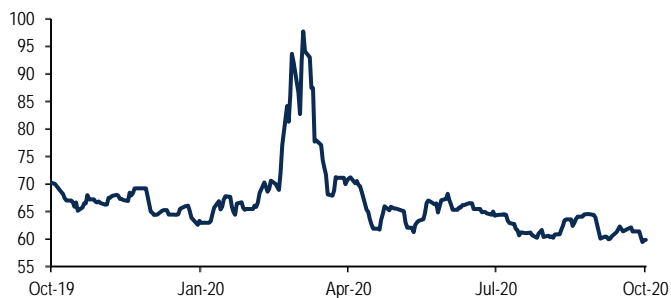
Source: BofA Global Research

Table 4: ATM Straddle Premiums

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.0%	0.1%	0.2%	0.5%	0.9%	1.5%	5.3%
3M	0.1%	0.2%	0.3%	0.7%	1.3%	2.3%	7.6%
6M	0.1%	0.2%	0.4%	1.1%	1.9%	3.2%	10.1%
1Y	0.1%	0.4%	0.7%	1.6%	2.8%	4.5%	13.9%
2Y	0.3%	0.7%	1.2%	2.6%	4.1%	6.4%	18.4%
3Y	0.5%	1.1%	1.8%	3.5%	5.2%	7.9%	21.8%
4Y	0.7%	1.5%	2.4%	4.3%	6.2%	9.2%	24.4%
5Y	0.9%	1.9%	2.8%	5.0%	7.1%	10.2%	26.6%
10Y	1.5%	2.9%	4.3%	7.0%	9.6%	13.4%	33.2%
30Y	1.7%	3.3%	4.9%	7.9%	10.9%	15.3%	38.6%

Source: BofA Global Research

Chart 2: 1y10y Normal Volatility



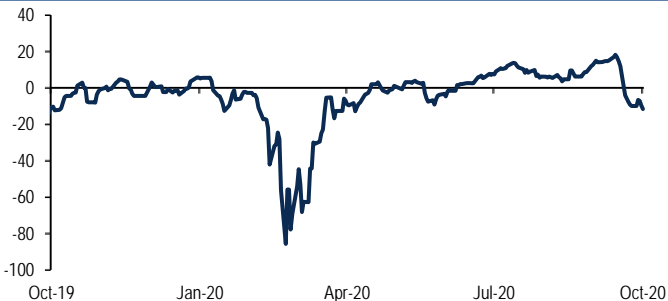
Source: BofA Global Research, Bloomberg

Chart 3: 3m10y vs. 3m2y Normal Volatility



Source: BofA Global Research, Bloomberg

Chart 4: 1y10y vs. 1m10y Normal Volatility



Source: BofA Global Research, Bloomberg

Chart 5: 2s10s curve directionality 96% dictated by belly



Source: BofA Global Research, Bloomberg

Volatility Grid Relative Value

PCA Z-SCORES

Table 5: 3m Z-Scores w/ PCA framework

	1y	2y	3y	5y	7y	10y	30y
3m	-0.4	1.7	0.1	3.4	0.2	0.2	-3.2
6m	0.5	2.3	0.8	2.7	2.0	1.9	-1.7
1y	-2.1	-1.4	-0.4	0.7	3.7	3.2	1.8
2y	-1.6	-1.3	-1.6	-0.1	0.0	-1.2	-1.7
5y	-2.1	-3.1	-3.0	-0.5	-1.3	-1.8	-3.6
10y	-1.4	-2.2	-2.2	-1.0	-0.8	-1.5	-1.4

Source: BofA Global Research

Table 6: 3m Z-Scores w/ PCA framework w/o rates directionality

	1y	2y	3y	5y	7y	10y	30y
3m	-0.9	-0.9	-0.9	-0.6	-1.2	-1.2	-1.7
6m	-1.1	-0.9	-0.9	-0.7	-1.5	-1.5	-2.3
1y	-2.2	-1.6	-1.5	-1.1	-1.3	-1.6	-1.7
2y	-2.0	-1.9	-1.8	-2.0	-2.3	-2.4	-2.8
5y	-2.1	-2.9	-3.0	-2.4	-2.4	-2.4	-3.5
10y	-1.8	-2.2	-2.2	-2.2	-2.0	-1.5	-2.3

Source: BofA Global Research

Table 7: 6m Z-Scores w/ PCA framework

	1y	2y	3y	5y	7y	10y	30y
3m	-0.6	-0.6	-0.9	2.4	-0.3	1.6	-0.9
6m	-0.3	0.6	-0.3	2.1	0.0	1.1	-2.0
1y	-1.3	-1.5	-0.6	2.5	2.2	1.2	0.5
2y	0.0	-0.3	-0.2	-0.1	0.6	0.0	-0.7
5y	0.0	-1.5	-1.3	-0.2	-0.3	-0.5	-1.4
10y	0.5	0.1	0.1	0.0	-0.1	-0.2	-0.3

Source: BofA Global Research

Table 8: 6m Z-Scores w/ PCA framework w/o rates directionality

	1y	2y	3y	5y	7y	10y	30y
3m	-1.0	-0.9	-1.1	-0.8	-1.7	-1.2	-1.5
6m	-1.0	-0.8	-1.0	-0.9	-1.8	-1.5	-2.2
1y	-1.3	-1.4	-1.4	-1.2	-1.1	-1.5	-1.4
2y	-1.7	-1.8	-1.8	-2.1	-2.0	-1.9	-1.7
5y	-2.1	-2.8	-2.7	-2.0	-1.9	-1.7	-1.8
10y	-0.7	-0.8	-0.9	-1.0	-1.0	-1.0	-1.3

Source: BofA Global Research

Table 9: 1y Z-Scores w/ PCA framework

	1y	2y	3y	5y	7y	10y	30y
3m	0.4	0.8	0.2	1.1	0.0	0.9	-0.3
6m	0.4	0.9	-1.0	1.2	-0.8	0.1	-1.5
1y	-0.3	-0.7	-0.9	0.2	0.2	-0.2	-0.2
2y	-0.8	-0.9	-0.9	-0.4	-0.2	-0.2	-0.4
5y	-1.0	-1.7	-1.8	-0.8	-0.2	0.0	-0.9
10y	1.5	2.3	2.6	1.7	1.6	1.3	0.0

Source: BofA Global Research

Table 10: 1y Z-Scores w/ PCA framework w/o rates directionality

	1y	2y	3y	5y	7y	10y	30y
3m	-0.1	0.0	-0.3	0.0	-0.2	-0.1	-0.2
6m	-0.1	-0.2	-0.5	-0.1	-0.3	-0.2	-0.4
1y	-0.4	-0.6	-0.7	-0.3	-0.2	-0.2	-0.2
2y	-0.8	-0.8	-0.8	-0.5	-0.3	-0.3	-0.3
5y	-1.1	-1.2	-1.2	-1.0	-0.9	-0.8	-0.9
10y	-0.8	-0.7	-0.7	-0.8	-0.8	-0.7	-0.8

Source: BofA Global Research

Table 11: 3m Z-Scores w/ modified PCA framework...

	1y	2y	3y	5y	7y	10y	30y
1m	-0.53	-0.18	-0.43	-1.28	0.15	0.46	0.17
3m	-1.27	-0.69	-0.88	-0.58	-0.64	-0.22	-0.95
6m	-1.34	-1.21	-1.24	-0.81	-0.91	-1.11	-0.11
1y	-1.41	-1.38	-1.58	-1.48	-1.36	-0.84	-0.05
2y	-1.57	-1.89	-1.58	-1.54	-1.42	-1.81	-0.23
3y	-1.77	-1.66	-0.43	0.69	-0.54	-0.14	-0.04
4y	-0.32	-0.07	-0.25	0.19	-1.51	-0.08	0.52
5y	-0.97	-1.02	-0.57	-1.12	-0.70	-0.21	0.63
10y	-1.60	-0.29	-0.61	-1.77	2.14	0.30	-0.83
15y	-0.60	-0.31	-0.83	2.04	-0.21	0.08	0.39
30y	-1.08	-2.07	-0.76	0.29	0.66	0.45	0.88

Source: BofA Global Research

Table 12: ...and w/o directionality with rates

	1y	2y	3y	5y	7y	10y	30y
1m	-0.73	-0.55	-0.73	-1.18	-0.07	0.57	0.10
3m	-0.96	-1.16	-0.97	-0.70	-0.68	-0.23	-0.94
6m	-1.27	-1.14	-1.29	-1.04	-1.11	-1.07	-0.11
1y	-1.37	-1.37	-1.69	-1.41	-1.52	-0.77	-0.09
2y	-1.54	-1.82	-1.61	-1.61	-1.52	-1.69	-0.20
3y	-1.71	-1.71	-0.62	0.41	-0.57	-0.07	1.09
4y	-0.70	-1.27	-0.18	0.01	-1.64	0.80	0.80
5y	-0.97	-3.00	-1.65	-1.07	-0.83	-0.34	0.55
10y	-2.16	-0.27	0.30	-1.10	1.06	0.38	-0.78
15y	-0.82	-0.51	-1.08	1.93	-0.61	0.30	-0.14
30y	-0.91	-1.82	-0.83	1.14	1.02	0.15	0.75

Source: BofA Global Research



Skew Relative Value

Table 13: Skew 25% delta

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.9	-1.0	-1.2	-2.6	-2.5	-1.6	-0.5
3M	-0.1	-0.3	-0.6	-1.9	-1.6	-0.5	0.5
6M	1.3	1.0	0.7	-0.6	-0.4	0.3	1.7
1Y	2.6	2.2	1.8	0.1	0.2	0.7	1.9
2Y	2.1	1.6	1.2	-0.1	-0.1	0.1	1.3
5Y	1.5	1.2	1.0	0.4	0.6	0.8	1.8
10Y	-0.9	-0.6	-0.3	0.3	0.6	0.9	2.0
30Y	0.1	0.4	0.7	1.2	1.3	1.4	2.6

Source: BofA Global Research

Table 14: Skew 75% delta

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	2.6	2.6	2.9	4.4	4.9	5.0	5.1
3M	3.5	3.4	3.5	4.7	5.2	5.4	5.7
6M	3.2	3.1	3.1	3.7	4.3	4.5	4.1
1Y	2.7	2.9	3.0	3.2	3.8	3.9	3.4
2Y	1.8	2.2	2.4	3.0	3.3	3.5	2.6
5Y	3.7	3.4	3.1	2.7	2.7	2.6	1.4
10Y	4.5	4.2	3.9	3.3	3.0	2.7	1.0
30Y	5.2	4.9	4.6	3.9	3.6	3.3	1.5

Source: BofA Global Research

Table 15: Breakeven Widths for Costless Receiver Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	5.0	5.4	6.6	11.3	14.9	19.6	26.3
3M	8.5	9.0	10.7	17.3	22.3	29.9	38.3
6M	13.4	14.9	17.2	26.6	33.9	42.8	53.1
1Y	25.0	27.4	31.8	41.6	51.7	61.5	74.0
2Y	44.7	50.3	55.1	66.5	76.5	85.9	97.4
5Y	123.6	124.9	127.1	134.0	137.8	142.5	145.7
10Y	192.0	193.8	195.3	198.0	199.1	200.6	192.9

Source: BofA Global Research

Table 16: Breakeven Widths for Costless Payer Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	7.2	7.5	9.0	15.1	18.8	23.4	29.5
3M	14.1	14.3	16.1	24.7	29.9	36.6	43.9
6M	18.8	19.8	21.9	32.9	40.8	49.2	56.5
1Y	25.6	29.7	35.1	48.5	59.4	68.5	76.7
2Y	43.9	52.1	59.2	75.4	86.2	95.7	100.9
5Y	134.2	135.1	136.9	144.2	147.0	150.3	143.5
10Y	226.0	223.6	221.0	215.6	213.3	210.1	185.0

Source: BofA Global Research

Table 17: 3m Z-Score for Receiver Skew (w/o directionality with forwards and ATM)

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.3	-1.6	-1.6	-1.7	-1.4	-1.1	-0.8
3M	-1.9	-1.1	-0.8	-1.0	-0.7	-0.3	-0.5
6M	-1.2	-0.7	-0.5	-0.9	-0.5	-0.2	-0.4
1Y	0.3	0.3	0.2	-1.4	-0.9	-0.3	-0.5
2Y	-0.5	-0.6	-0.9	-1.9	-1.8	-1.8	-2.1
5Y	-0.2	0.0	-0.1	-0.8	-1.1	-1.5	-1.0
10Y	-0.1	0.3	0.4	0.7	1.1	1.4	0.9

Source: BofA Global Research

Table 18: 3m Z-Score for Payer Skew (w/o directionality with forwards and ATM)

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

Source: BofA Global Research

Table 19: Ratio of Payer/Receiver BE widths for Costless Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	145%	140%	136%	133%	126%	119%	112%
3M	166%	158%	150%	142%	134%	122%	115%
6M	141%	133%	127%	124%	120%	115%	107%
1Y	102%	108%	110%	117%	115%	111%	104%
2Y	98%	104%	107%	113%	113%	111%	104%
5Y	109%	108%	108%	108%	107%	105%	98%
10Y	118%	115%	113%	109%	107%	105%	96%

Source: BofA Global Research

Table 20: 3m Z-Score Ratio of Payer/Receiver Skew

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	2.0	2.0	2.1	2.4	2.1	1.8	1.7
3M	2.2	2.2	2.2	2.4	2.2	1.6	1.3
6M	2.0	2.0	2.0	2.3	2.1	1.6	1.0
1Y	1.5	1.6	1.6	2.4	2.0	1.1	0.9
2Y	1.2	1.4	1.7	2.2	2.1	1.9	1.0
5Y	-0.5	-0.9	-0.8	-0.8	-0.8	-0.8	-0.9
10Y	-0.7	-1.0	-1.1	-1.2	-1.3	-1.3	-1.5

Source: BofA Global Research



Conditional Curve Trades

Table 21: Bull Flattener (pickup to forwards for ATM)

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-8.3	-23.3	-35.3	-10.1	-18.3	-6.0
6M	-12.8	-32.5	-46.8	-13.4	-22.8	-6.9
1Y	-17.7	-40.9	-56.5	-16.3	-27.2	-8.3
1.5Y	-18.7	-40.5	-54.0	-16.3	-26.1	-7.5
2Y	-17.9	-37.4	-47.9	-15.7	-23.7	-6.5

Source: BofA Global Research

Table 22: Bull Flattener (pickup to forwards for -25bp OTM)

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	na	na	na	-29.6	-51.5	-12.2
6M	-19.6	na	-88.8	-27.4	-47.2	-12.2
1Y	-23.9	-61.0	-86.6	-26.5	-44.4	-12.6
1.5Y	-25.1	-57.5	-78.6	-23.9	-39.0	-11.0
2Y	-23.5	-50.7	-66.7	-21.2	-33.1	-9.3

Source: BofA Global Research

Table 23: Bull Steeper (pickup to forwards for ATM)

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	8.3	23.3	35.3	10.1	18.3	6.0
6M	12.8	32.5	46.8	13.4	22.8	6.9
1Y	17.7	40.9	56.5	16.3	27.2	8.3
1.5Y	18.7	40.5	54.0	16.3	26.1	7.5
2Y	17.9	37.4	47.9	15.7	23.7	6.5

Source: BofA Global Research

Table 24: Bull Steeper (pickup to forwards for -25bp OTM)

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	na	na	na	29.6	51.5	12.2
6M	19.6	na	88.8	27.4	47.2	12.2
1Y	23.9	61.0	86.6	26.5	44.4	12.6
1.5Y	25.1	57.5	78.6	23.9	39.0	11.0
2Y	23.5	50.7	66.7	21.2	33.1	9.3

Source: BofA Global Research

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

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	11.6	29.4	42.1	11.8	20.8	6.7
6M	15.7	38.6	51.1	14.9	24.3	7.1
1Y	20.2	46.2	59.7	17.9	28.2	8.5
1.5Y	21.2	45.4	56.3	17.9	26.9	7.7
2Y	19.6	41.1	49.7	16.9	24.3	6.7

Source: BofA Global Research

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

+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	25.1	62.0	87.2	24.5	41.5	11.8
6M	27.2	69.2	89.4	27.4	41.9	10.6
1Y	33.3	76.1	95.8	27.8	42.1	11.2
1.5Y	33.7	70.8	85.1	25.5	36.8	9.5
2Y	30.2	60.8	70.8	22.8	31.5	7.7

Source: BofA Global Research

Table 27: Bear Steeper (pickup to forwards for ATM)

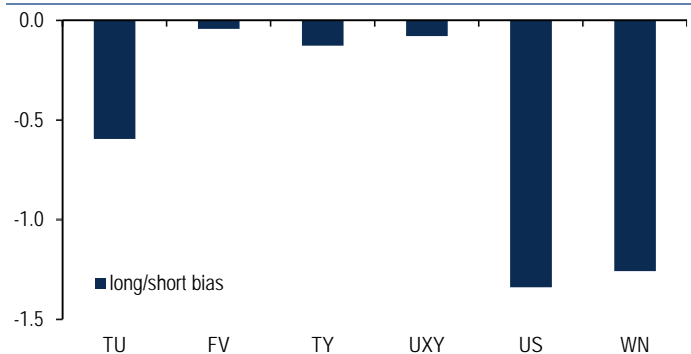
ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-11.6	-29.4	-42.1	-11.8	-20.8	-6.7
6M	-15.7	-38.6	-51.1	-14.9	-24.3	-7.1
1Y	-20.2	-46.2	-59.7	-17.9	-28.2	-8.5
1.5Y	-21.2	-45.4	-56.3	-17.9	-26.9	-7.7
2Y	-19.6	-41.1	-49.7	-16.9	-24.3	-6.7

Source: Bear Steeper (pickup to forwards for +25bp OTM)

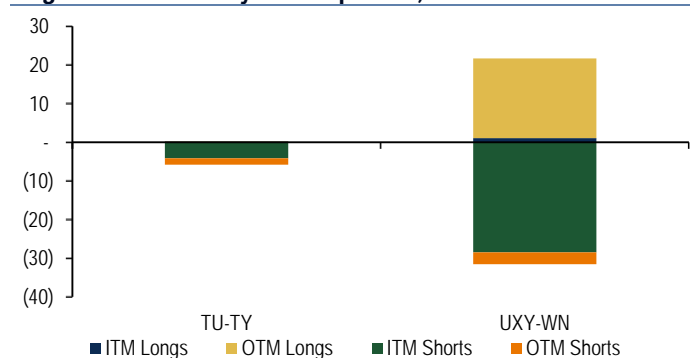
Table 28: Bear Steeper (pickup to forwards for +25bp OTM)

+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-25.1	-62.0	-87.2	-24.5	-41.5	-11.8
6M	-27.2	-69.2	-89.4	-27.4	-41.9	-10.6
1Y	-33.3	-76.1	-95.8	-27.8	-42.1	-11.2
1.5Y	-33.7	-70.8	-85.1	-25.5	-36.8	-9.5
2Y	-30.2	-60.8	-70.8	-22.8	-31.5	-7.7

Source: Bear Steeper (pickup to forwards for +25bp OTM)

Chart 6: Analysis of proxies for futures positioning reveals a short bias across the curve


Source: BofA Global Research

Chart 7: Proxies for futures positioning reveals a propensity towards bear steepening between the belly and backend of the curve (as OTM longs in the backend may drive stop losses)


Source: BofA Global Research



Forward Volatility

Table 29: 6m Forward Volatility

	1y	2y	5y	10y	30y
1m	11.6	17.6	36.0	56.8	67.1
3m	12.9	19.0	37.1	57.1	67.3
6m	16.8	22.3	39.0	57.5	66.9
1y	23.2	28.1	42.3	57.8	64.5
2y	33.1	36.3	47.3	58.8	62.2
5y	53.2	53.6	57.5	60.5	58.9
10y	60.6	60.7	60.4	60.1	55.0

Source: BofA Global Research

Table 30: 6m Fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	61%	86%	83%	80%	72%
3m	73%	99%	97%	93%	89%
6m	101%	114%	101%	96%	93%
1y	128%	125%	102%	97%	93%
2y	121%	112%	101%	98%	95%
5y	102%	100%	98%	98%	97%
10y	98%	99%	99%	99%	98%

Source: BofA Global Research

Table 31: 3m Z-Score of 6m Fwd vol % ATM

	1y	2y	5y	10y	30y
1m	-1.5	-1.6	-2.0	-1.9	-1.7
3m	-1.0	-0.7	-0.5	-0.1	0.5
6m	-1.0	-0.8	-0.4	0.1	1.0
1y	0.2	0.6	-0.2	-0.1	0.1
2y	1.1	0.7	0.6	0.3	0.3
5y	2.2	2.1	1.8	1.7	1.4
10y	2.0	2.0	2.0	1.7	1.4

Source: BofA Global Research

Table 32: 1y Forward Volatility

	1y	2y	5y	10y	30y
1m	19.6	22.9	37.9	55.6	63.2
3m	20.7	24.7	39.4	55.9	62.2
6m	23.5	27.2	40.6	56.0	61.2
1y	27.6	31.4	42.4	56.3	60.2
2y	35.8	39.1	47.2	58.0	59.3
5y	52.6	52.3	56.1	59.1	56.8
10y	60.0	60.1	59.4	59.1	53.8

Source: BofA Global Research

Table 33: 1y Fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	103%	112%	87%	78%	68%
3m	117%	128%	103%	91%	82%
6m	141%	140%	105%	93%	85%
1y	152%	139%	103%	94%	86%
2y	131%	121%	101%	97%	90%
5y	101%	98%	96%	96%	93%
10y	98%	98%	97%	97%	95%

Source: BofA Global Research

Table 34: 3m Z-Score of 1y Fwd vol % ATM

	1y	2y	5y	10y	30y
1m	-1.6	-1.8	-2.2	-2.0	-1.9
3m	-0.8	-0.7	-0.7	-0.3	-0.1
6m	-0.8	-0.8	-0.9	-0.3	-0.2
1y	0.5	0.3	-1.5	-0.5	-1.0
2y	1.0	0.9	0.1	0.5	-0.4
5y	1.3	1.1	1.2	1.5	1.0
10y	1.8	1.8	1.7	1.3	0.8

Source: BofA Global Research

Table 35: 2y Forward Volatility

	1y	2y	5y	10y	30y
1m	33.4	34.1	40.6	53.3	57.1
3m	31.5	33.4	41.5	54.1	57.5
6m	34.1	35.8	43.4	55.0	57.3
1y	35.0	38.8	45.3	55.7	56.9
2y	46.0	44.1	48.5	56.7	56.1
5y	53.2	52.5	54.8	57.8	54.4
10y	59.3	59.3	58.4	57.8	52.3

Source: BofA Global Research

Table 36: 2y Fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	176%	166%	93%	75%	61%
3m	179%	174%	109%	89%	76%
6m	204%	184%	112%	91%	80%
1y	193%	172%	110%	93%	82%
2y	168%	136%	103%	94%	85%
5y	102%	98%	93%	94%	89%
10y	96%	96%	95%	95%	93%

Source: BofA Global Research

Table 37: 3m Z-Score of 2y Fwd vol % ATM

	1y	2y	5y	10y	30y
1m	-1.6	-1.6	-2.2	-2.0	-2.0
3m	-0.8	-0.6	-0.9	-0.3	-0.1
6m	-0.8	-0.3	-0.8	0.0	0.1
1y	0.8	0.9	-0.3	0.3	-0.4
2y	1.4	1.2	0.8	1.2	0.4
5y	1.1	1.3	0.6	2.0	1.9
10y	2.2	2.2	2.1	1.8	1.8

Source: BofA Global Research

Table 38: 3y Forward Volatility

	1y	2y	5y	10y	30y
1m	48.0	48.0	48.6	54.4	54.3
3m	42.6	45.8	47.4	54.5	54.9
6m	46.6	49.0	48.7	55.0	54.6
1y	49.0	50.4	49.4	54.9	54.1
2y	52.7	46.7	50.8	55.0	54.0
5y	55.1	54.2	54.5	57.3	52.8
10y	58.8	58.8	57.8	57.1	51.1

Source: BofA Global Research

Table 39: 3y Fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	252%	234%	111%	76%	58%
3m	242%	238%	124%	89%	72%
6m	280%	251%	126%	91%	76%
1y	269%	223%	120%	92%	78%
2y	193%	144%	109%	92%	82%
5y	106%	102%	93%	93%	86%
10y	96%	96%	94%	94%	91%

Source: BofA Global Research

Table 40: 3m Z-Score of 3y Fwd vol % ATM

	1y	2y	5y	10y	30y
1m	-1.6	-1.4	-2.0	-2.0	-2.0
3m	-0.7	-0.2	-0.6	-0.1	0.1
6m	0.3	0.4	-0.5	0.3	0.2
1y	1.4	1.1	0.1	0.5	-0.2
2y	1.4	0.8	1.1	0.9	1.1
5y	1.2	1.4	0.5	2.1	2.0
10y	2.4	2.4	2.2	2.0	2.0

Source: BofA Global Research

Table 41: 5y Forward Volatility

	1y	2y	5y	10y	30y
1m	77.3	67.0	60.9	58.3	54.1
3m	68.6	62.3	58.4	57.2	53.4
6m	65.1	60.7	57.2	56.8	52.9
1y	61.2	58.8	55.7	56.4	51.9
2y	58.8	53.6	54.8	56.6	51.3
5y	59.3	58.4	56.7	58.6	51.2
10y	58.3	58.2	57.3	56.4	49.4

Source: BofA Global Research

Table 42: 5y Fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	406%	326%	140%	82%	58%
3m	389%	324%	153%	94%	70%
6m	391%	311%	148%	95%	74%
1y	336%	261%	135%	94%	74%
2y	215%	166%	117%	94%	78%
5y	113%	110%	97%	95%	84%
10y	95%	95%	94%	93%	88%

Source: BofA Global Research

Table 43: 3m Z-Score of 5y Fwd vol % ATM

	1y	2y	5y	10y	30y
1m	-0.4	-0.9	-1.8	-1.9	-1.7
3m	1.0	0.4	-0.3	0.0	0.6
6m	1.4	0.6	-0.2	0.4	1.1
1y	2.1	1.2	0.1	0.8	1.1
2y	1.3	0.8	0.2	1.6	1.9
5y	2.1	2.8	1.9	2.6	2.4
10y	2.3	2.4	2.3	2.1	2.2

Source: BofA Global Research



Ratios implied/delivered

Table 44: Implied vs. Delivered (21d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	395%	242%	191%	177%	182%	195%	202%
3m	262%	189%	154%	145%	150%	162%	163%
6m	178%	152%	131%	137%	145%	155%	153%
1y	141%	127%	117%	125%	136%	144%	145%
2y	121%	108%	103%	119%	125%	133%	132%

Source: BofA Global Research

Table 45: Implied vs. Delivered (63d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	170%	145%	138%	152%	153%	162%	166%
3m	143%	124%	116%	126%	126%	134%	134%
6m	118%	110%	105%	118%	122%	128%	126%
1y	102%	102%	101%	110%	116%	120%	120%
2y	102%	97%	94%	102%	106%	110%	109%

Source: BofA Global Research

Table 46: 3m Z-Scores for Implied vs. Delivered (21d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	2.6	1.8	1.2	1.5	1.5	1.8	1.9
3m	1.5	1.0	0.2	0.3	0.3	0.8	0.9
6m	0.6	0.4	-0.1	0.2	0.3	0.6	0.8
1y	0.0	-0.1	-0.3	0.0	0.4	0.6	0.9
2y	-0.3	-0.5	-0.5	0.1	0.4	0.6	0.7

Source: BofA Global Research

Table 47: 3m Z-Scores for Implied vs. Delivered (63d) Ratio

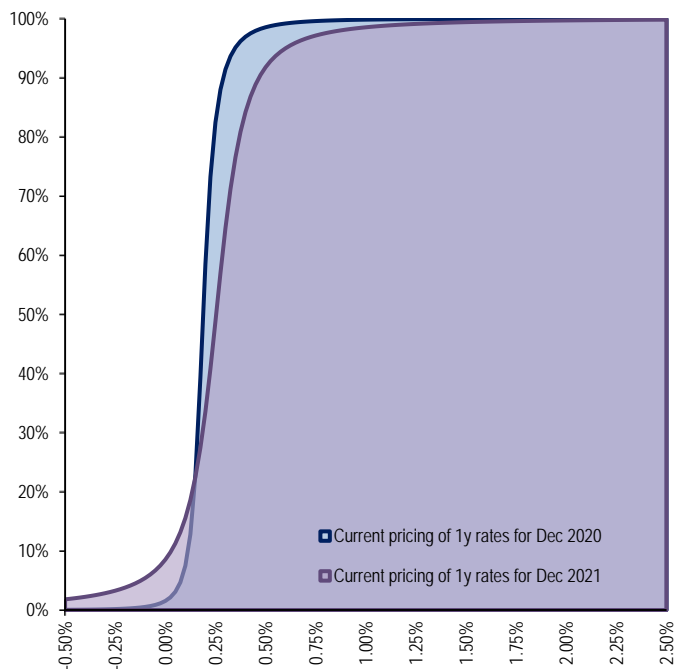
	1y	2y	3y	5y	7y	10y	30y
1m	1.7	1.4	1.5	2.2	2.1	2.2	2.1
3m	0.0	-0.1	-0.3	0.5	0.2	0.5	0.4
6m	-0.5	-0.3	-0.6	0.5	0.3	0.6	0.5
1y	-1.4	-1.0	-0.7	0.4	0.6	0.6	0.8
2y	-0.8	-0.6	-0.5	0.3	0.6	0.7	0.7

Source: BofA Global Research

Negative rates probabilities

Chart 8: CDF for 1y rates at end-2020 and end-2021

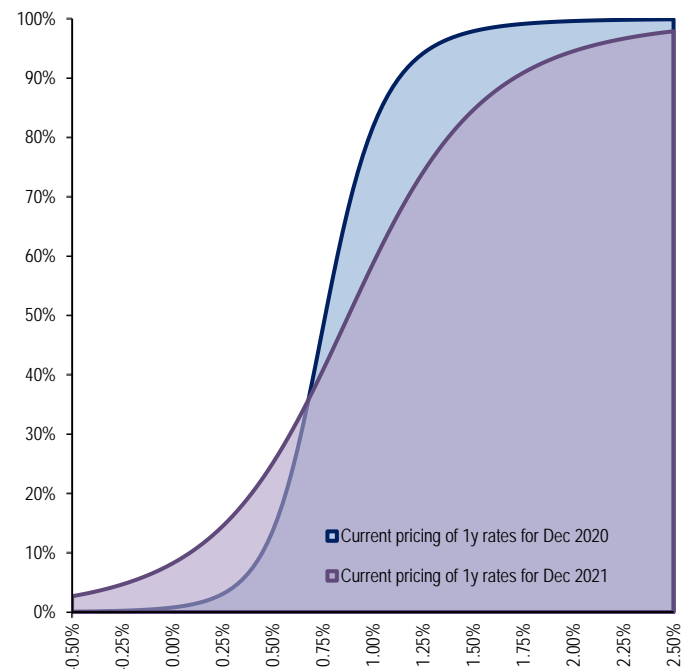
Implied negative rate probability at end-2020 (1.5%) and end-2021 (8.5%)



Source: BofA Global Research

Chart 9: CDF for 10y rates at end-2020 and end-2021

Implied negative rate probability at end-2020 (0.8%) and end-2021 (8.2%)



Source: BofA Global Research



Trade activity

Exhibit 1: Payer volumes over the last week (\$m notional)

Payers	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	-	-	-	50	-	-	1,180	120	400	1,750
1m	-	-	-	-	1,880	72	1,929	-	864	4,745
3m	350	-	-	-	1,120	-	1,828	-	669	3,967
6m	-	920	-	-	920	-	1,034	170	145	3,189
1y	-	1,890	-	250	289	5	1,634	2	505	4,575
2y	500	450	36	-	105	-	880	25	1,235	3,231
3Y	-	70	240	-	122	96	240	-	17	785
4Y	-	-	-	-	-	-	-	-	24	24
5Y	300	150	-	-	-	-	-	-	239	689
7Y	-	-	-	-	3	-	30	-	-	33
10Y	-	-	-	-	-	-	564	363	-	927
20Y	-	-	-	-	-	-	-	-	-	-
30Y	-	-	-	-	-	-	-	-	-	-
	1,150	3,480	276	300	4,439	173	9,319	680	4,098	23,915

Source: BofA Global Research

Exhibit 2: Receiver volumes over the last week (\$m notional)

Receivers	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	-	-	-	50	-	340	770	-	254	1,414
1m	-	130	720	-	480	508	408	50	710	3,006
3m	350	-	1,120	-	880	-	1,190	120	682	4,342
6m	-	-	100	-	1,750	-	496	1,010	170	3,526
1y	-	2,350	-	350	870	10	1,192	-	318	5,090
2y	-	2,715	1,458	-	80	-	145	25	380	4,803
3Y	-	990	-	-	100	96	-	30	12	1,228
4Y	1,000	-	-	-	-	-	-	-	24	1,024
5Y	300	150	-	-	-	260	-	25	239	974
7Y	-	-	-	-	-	120	33	-	-	153
10Y	-	-	-	-	-	-	589	388	-	977
20Y	-	-	-	-	-	-	-	-	-	-
30Y	-	-	-	-	-	-	-	-	-	-
	1,650	6,335	3,398	400	4,160	1,334	4,823	1,648	2,789	26,537

Source: BofA Global Research

Exhibit 3: Straddle volumes over the last week (\$m notional)

Straddles	1y	2y	3Y	4Y	5Y	7Y	10Y	20Y	30Y	
<1m	-	-	-	-	-	-	70	24	100	194
1m	-	-	-	-	130	-	1,076	24	160	1,390
3m	-	-	-	-	100	-	758	-	135	993
6m	-	-	-	-	-	-	695	-	30	725
1y	-	710	-	-	680	-	1,290	200	85	2,965
2y	1,000	330	-	-	-	-	1,481	-	675	3,486
3Y	500	300	200	-	240	-	645	-	75	1,960
4Y	-	-	-	-	-	-	50	120	-	170
5Y	-	-	-	-	-	-	25	120	40	185
7Y	-	-	-	-	-	-	-	100	-	100
10Y	300	-	-	-	-	-	99	100	-	499
20Y	-	-	-	-	-	-	-	-	-	-
30Y	-	-	-	-	-	-	-	-	-	-
	1,800	1,340	200	-	1,150	-	6,189	688	1,300	12,667

Source: BofA Global Research



Formosa issuance

Exhibit 4: 2019 Formosa issuance (\$m)

	Underlying											
	1	2	3	4	5	7	10	15	20	25	30	
Lockout	1	-	-	-	-	-	160	-	-	-	-	
	2	-	-	-	-	-	104	-	-	-	50	
	3	-	-	-	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	-	-	6,053	
	7	-	-	-	-	-	-	-	-	-	80	
	10	-	-	-	-	-	-	-	-	-	-	
	15	-	-	-	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	-	-	-	
	25	-	-	-	-	-	-	-	-	-	-	
	30	-	-	-	-	-	-	-	-	-	3,000	

Source: BofA Global Research, Bloomberg

Exhibit 5: 2020 Formosa issuance YTD (\$m)

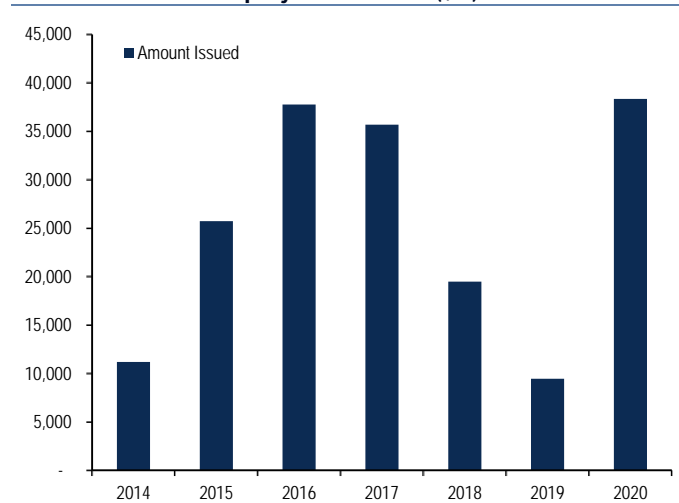
	Underlying										
	1	2	3	4	5	7	10	15	20	25	30
Lockout	1	-	-	-	-	-	295	-	-	-	-
	2	-	-	-	-	-	50	-	-	-	40
	3	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	20
	5	-	-	-	-	-	-	-	-	-	34,611
	7	-	-	-	-	-	-	-	-	-	820
	10	-	-	-	-	-	-	-	-	-	-
	15	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-
	25	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	2,500	

Source: BofA Global Research, Bloomberg

Exhibit 6: Formosa Issuance since 2014 (\$m)

	Underlying											
	1	2	3	4	5	7	10	15	20	25	30	
Lockout	1	-	-	-	-	205	-	520	442	840	-	18,054
	2	-	-	-	-	-	-	154	-	1,485	-	22,177
	3	-	-	-	-	-	-	-	-	240	225	15,411
	4	-	-	-	-	-	-	-	-	25	275	2,441
	5	-	-	-	-	-	-	-	400	1,277	273	98,510
	7	-	-	-	-	-	-	-	-	-	-	5,499
	10	-	-	-	-	-	-	-	-	-	-	3,601
	15	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-
	25	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	5,500	

Source: BofA Global Research, Bloomberg

Chart 10: Total issuance per year since 2014 (\$m)


Source: BofA Global Research, Bloomberg

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