



22 January 2019

### Views and flows

The 10yT yield has drifted toward the 2.8% mid-point of the expected steady state range near-term, as the market faded some of the unreasonable part of the risk-off sentiment (see [here](#)). This helped the underperformance of the right side in gamma space and steepening of the term structure curves. We expect this dynamic to persist near term. The left side of the grid is likely to stay supported by a data-dependent Fed and further buildup of optionality in 1H (only less than 20% probability priced in for June currently).

### Relative value

Volatility drifted lower last week, with the right side underperforming in gamma versus the left, and vice versa for intermediate expiries (Table 3). Right side volatility now looks cheap on 3m PCA Z-Scores when directionality with rates is removed (Table 6 and Table 8), but given our expectations for anchored back end yields we find it difficult to exploit this cheapness. The volatility curves continue to be inverted virtually across the grid, with the peak of inversion at 3y expiries. Ratios of implied to delivered volatility continue to reveal cheapness of implieds, particularly on the left side of the grid.

Receiver skew continues to look rich relative to payer skew (see Table 21), and we expect this to persist in the context of a late cycle dynamic. On Z-Scores, however, this richness seems to be more pronounced (versus the recent history) on the right side of the grid (Table 22). In the context of the recent dynamic of the forwards, however, we continue to see scope for richening of receiver skew, particularly for intermediate expiries (see Table 19).

On Conditional curves, bull steepeners and bear flatteners give up to the forwards virtually across the grid (see Table 25 and Table 27), while bull flatteners and bear steepeners show pickups that are somewhat attractive in the context of the recent history (see Table 23 and Table 29). We recommended fading the recent steepening of the 5s30s curve through bear steepeners in the last edition of the *Vol Views* ([here](#)), expressed by buying payer spreads in 5y tails to overcome the give up.

Forward volatility has richened across expiries over the last couple of weeks, particularly in 1m to 3m expiries on 1y tails (Table 32).

### Trade recommendations

The richening of forward volatility in 1m to 3m expiries on 1y tails is consistent with a scenario whereby the Fed is under little pressure to act near term, but considers the turn in the cycle over a 12-24 month horizon. This cycle turn is indeed generally accompanied by a meaningful pickup in volatility across asset classes. Two trades that fit with this view are long 6m forward 1y1y volatility (at an indicative cost of 106% of the atm volatility) and a 6m vs. 21m receiver calendar, where one sells 6m2y receivers atm to finance 21m2y receivers atm-15bp (costless indicative and recommended previously). Both trades are exposed to a scenario where volatility picks up meaningfully near term, with potentially unlimited downside.

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# Levels and Recent Moves

Table 1: ATM Normal Volatility Grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	35.1	52.6	57.1	59.1	57.3	55.5	51.5
3M	39.1	56.2	59.5	60.9	59.1	57.2	52.8
6M	48.9	61.4	63.3	64.1	62.2	60.3	55.5
1Y	61.2	68.0	68.0	68.0	66.0	63.9	58.3
2Y	74.6	77.3	76.0	73.0	70.5	67.8	61.5
3Y	79.4	80.2	78.7	75.3	72.6	69.7	62.8
4Y	80.5	80.5	79.2	76.0	73.4	70.6	63.2
5Y	81.3	80.5	79.2	76.3	73.8	71.2	63.3
10Y	74.2	73.5	72.7	71.0	68.9	66.7	59.1
30Y	52.4	52.2	51.9	51.1	50.1	48.9	46.0

Source: BofA Merrill Lynch Global Research

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

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.0	-0.3	-0.4	-0.6	-0.9	-1.1	-1.3
3M	-0.9	0.0	-0.3	-0.7	-1.2	-1.7	-2.1
6M	-0.3	0.1	-0.3	-0.8	-1.3	-1.9	-2.4
1Y	-0.4	-0.7	-1.1	-1.4	-1.8	-2.2	-2.6
2Y	-1.0	-1.2	-1.2	-1.8	-2.1	-2.2	-2.3
3Y	-1.6	-1.6	-1.4	-1.7	-2.1	-2.2	-2.2
4Y	-1.9	-1.7	-1.5	-1.7	-2.0	-2.1	-2.2
5Y	-1.4	-1.5	-1.4	-1.6	-1.8	-1.9	-2.0
10Y	-0.1	0.0	-0.1	-0.5	-0.5	-0.6	-0.9
30Y	-1.3	-1.1	-1.0	-0.7	-0.5	-0.5	-0.8

Source: BofA Merrill Lynch Global Research

Table 3: ATM Normal Volatility Grid - CoW

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-3.5	-3.7	-3.4	-3.3	-3.0	-3.1	-3.3
3M	-1.9	-2.5	-2.6	-2.7	-2.1	-2.5	-2.8
6M	0.0	-0.1	-1.2	-1.6	-1.6	-2.0	-2.3
1Y	-0.1	-0.9	-1.6	-1.9	-1.8	-1.8	-2.1
2Y	-2.3	-2.0	-1.8	-1.5	-1.4	-1.2	-1.2
3Y	-1.6	-1.2	-1.1	-0.8	-0.9	-1.0	-1.0
4Y	-0.9	-0.9	-0.8	-0.5	-0.6	-0.6	-0.7
5Y	-0.2	-0.6	-0.5	-0.2	-0.3	-0.3	-0.5
10Y	0.7	0.7	0.6	0.6	0.6	0.6	0.3
30Y	0.4	0.4	0.4	0.4	0.4	0.3	0.2

Source: BofA Merrill Lynch Global Research

Table 4: ATM Straddle Premiums

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.1%	0.2%	0.4%	0.6%	0.8%	1.1%	2.3%
3M	0.2%	0.4%	0.7%	1.1%	1.5%	1.9%	4.1%
6M	0.3%	0.7%	1.0%	1.6%	2.2%	2.9%	6.1%
1Y	0.5%	1.0%	1.5%	2.4%	3.2%	4.3%	9.0%
2Y	0.8%	1.6%	2.3%	3.6%	4.8%	6.3%	13.1%
3Y	1.0%	2.0%	2.9%	4.5%	5.9%	7.7%	16.0%
4Y	1.1%	2.3%	3.3%	5.1%	6.7%	8.8%	18.1%
5Y	1.3%	2.5%	3.6%	5.6%	7.3%	9.6%	19.8%
10Y	1.4%	2.8%	4.0%	6.4%	8.4%	11.2%	23.0%
30Y	1.0%	2.0%	3.0%	4.7%	6.3%	8.5%	19.0%

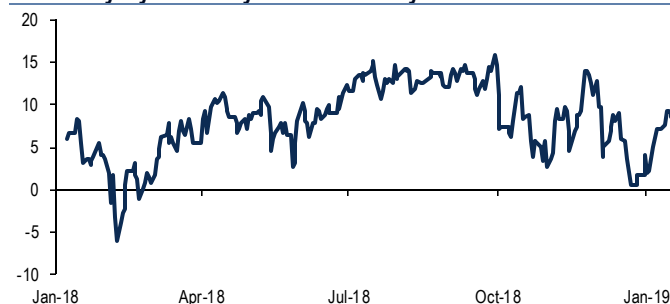
Source: BofA Merrill Lynch Global Research

Chart 1: 1y10y Normal Volatility



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 2: 1y10y vs. 1m10y Normal Volatility



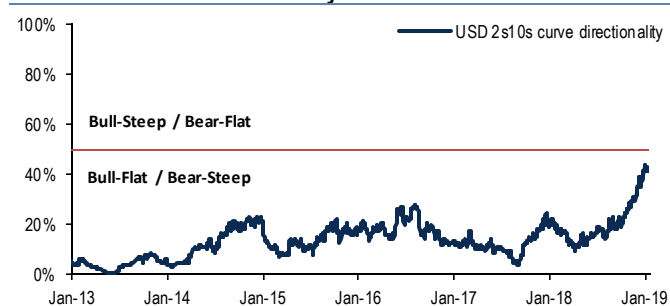
Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 3: 3m10y vs. 3m2y Normal Volatility



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 4: 2s10s curve directionality



Source: BofA Merrill Lynch 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	-1.0	-1.0	-1.1	0.4	1.6	0.6	-0.1
6m	0.1	2.2	1.2	1.0	1.7	0.3	-1.1
1y	0.8	0.7	-0.1	-0.9	-1.5	-1.2	-2.9
2y	-1.6	-1.2	-1.7	-1.3	-1.2	-0.6	-1.0
5y	-0.3	-0.8	-0.8	-0.3	-0.2	-0.2	-0.5
10y	1.6	1.6	1.5	1.4	1.4	1.4	1.1

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	-2.6	0.1	0.6	1.8	2.4	1.2	0.6
6m	-0.4	1.8	0.6	0.9	0.8	-0.9	-1.2
1y	0.8	1.9	0.1	-0.6	-1.5	-2.1	-2.4
2y	0.4	0.8	-0.2	-1.0	-2.5	-1.5	-1.8
5y	1.0	-1.0	-0.7	0.1	-0.6	-0.9	-0.9
10y	0.4	0.4	0.4	-0.2	-0.3	0.4	0.3

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	-2.0	2.0	0.9	1.1	1.3	0.6	-0.3
6m	0.1	2.5	0.0	0.8	1.2	-1.1	-1.6
1y	-0.4	-0.2	-1.3	-0.4	-0.9	-1.3	-2.3
2y	-0.3	-1.0	0.0	-0.6	-0.8	-1.0	-1.4
5y	-0.2	0.3	0.5	0.0	-0.8	-0.8	-0.4
10y	0.5	0.8	1.0	0.8	0.9	1.3	-0.5

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	-1.8	-1.4	-1.5	-1.6	-1.8	-2.1	-2.2
6m	-1.3	-1.0	-1.4	-1.7	-2.0	-2.4	-2.7
1y	-1.2	-1.4	-1.9	-2.2	-2.4	-2.6	-3.0
2y	-2.1	-2.2	-2.3	-2.5	-2.7	-2.7	-2.8
5y	-1.7	-1.9	-1.8	-1.9	-2.1	-2.2	-2.5
10y	-0.4	-0.2	-0.2	-0.5	-0.5	-0.6	-0.9

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	-2.3	-1.7	-1.8	-1.9	-2.1	-2.5	-2.6
6m	-1.6	-1.3	-1.8	-2.1	-2.3	-2.8	-3.0
1y	-1.5	-1.6	-2.2	-2.7	-3.1	-3.1	-3.3
2y	-1.7	-1.9	-2.3	-2.9	-3.2	-3.2	-3.2
5y	-1.7	-2.1	-2.1	-2.3	-2.5	-2.6	-2.8
10y	-0.7	-0.5	-0.6	-0.8	-0.9	-0.8	-1.1

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	0.4	1.2	1.0	0.8	0.4	-0.1	-0.6
6m	1.1	1.5	1.1	0.8	0.5	-0.1	-0.6
1y	1.4	1.3	1.0	0.8	0.5	0.0	-0.4
2y	1.4	1.3	1.3	0.9	0.6	0.2	0.0
5y	1.4	1.4	1.4	1.2	1.1	0.9	0.7
10y	1.3	1.4	1.4	1.4	1.3	1.3	1.3

Source: BofA Merrill Lynch Global Research

## IMPLIED/DELIVERED RATIOS

Table 11: Implied vs. Delivered (21d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	67%	69%	68%	72%	75%	78%	97%
3m	60%	67%	67%	72%	76%	80%	98%
6m	60%	66%	68%	74%	79%	84%	103%
1y	61%	68%	71%	79%	84%	90%	109%
2y	73%	82%	85%	92%	96%	102%	117%

Source: BofA Merrill Lynch Global Research

Table 12: Implied vs. Delivered (63d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	87%	92%	90%	96%	99%	102%	112%
3m	80%	89%	89%	96%	100%	104%	114%
6m	80%	88%	91%	99%	104%	108%	119%
1y	81%	90%	95%	104%	109%	114%	125%
2y	96%	109%	113%	120%	123%	128%	133%

Source: BofA Merrill Lynch Global Research

Table 13: 3m Z-Scores for Implied vs. Delivered (21d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	-2.0	-2.1	-2.1	-2.1	-1.9	-1.8	-1.4
3m	-2.0	-2.1	-2.2	-2.0	-1.9	-1.7	-1.4
6m	-2.0	-2.1	-2.1	-2.0	-1.8	-1.7	-1.3
1y	-2.1	-2.1	-2.1	-1.9	-1.7	-1.6	-1.2
2y	-2.0	-2.0	-1.8	-1.6	-1.5	-1.4	-1.0

Source: BofA Merrill Lynch Global Research

Table 14: 3m Z-Scores for Implied vs. Delivered (63d) Ratio

	1y	2y	3y	5y	7y	10y	30y
1m	-2.2	-2.1	-2.3	-2.2	-2.0	-1.8	-0.9
3m	-2.2	-2.3	-2.4	-2.4	-2.3	-2.1	-1.2
6m	-2.2	-2.3	-2.3	-2.4	-2.3	-2.1	-1.0
1y	-2.2	-2.3	-2.4	-2.5	-2.3	-1.9	-0.5
2y	-2.4	-2.5	-2.4	-2.1	-1.6	-1.0	0.3

Source: BofA Merrill Lynch Global Research

# Skew Relative Value

Table 15: Skew 25% delta

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	2.7	3.6	3.7	3.3	2.9	2.2	1.9
3M	4.4	5.6	4.9	3.8	3.4	2.9	2.5
6M	5.8	6.7	6.2	5.0	4.3	3.5	2.3
1Y	6.8	8.0	6.8	4.9	4.1	2.9	2.0
2Y	6.6	6.3	5.5	4.0	3.4	2.7	2.4
5Y	3.6	3.5	3.3	2.9	2.6	2.2	2.6
10Y	2.7	2.8	3.0	3.4	3.5	3.6	3.9
30Y	5.8	5.9	6.0	6.4	6.4	6.6	6.9

Source: BofA Merrill Lynch Global Research

Table 16: Skew 75% delta

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.4	-1.6	-1.5	-1.0	-0.5	0.1	0.3
3M	-2.6	-2.8	-1.8	-0.3	0.0	0.4	0.6
6M	-1.7	-1.5	-1.6	-0.8	-0.2	0.6	1.0
1Y	-1.2	-1.9	-1.9	-0.7	0.1	1.1	1.2
2Y	-2.8	-2.2	-1.3	0.3	0.8	1.5	1.3
5Y	2.2	2.3	2.5	2.7	2.9	3.2	2.3
10Y	6.3	6.1	5.9	5.3	5.0	4.6	3.4
30Y	9.1	8.9	8.7	8.2	7.9	7.4	6.3

Source: BofA Merrill Lynch Global Research

Table 17: Breakeven Widths for Costless Receiver Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	11.6	17.1	18.4	18.8	17.8	17.0	15.6
3M	24.5	34.4	35.3	34.6	33.1	31.7	28.9
6M	44.3	54.2	54.6	52.9	50.4	47.8	42.3
1Y	77.6	87.1	83.2	78.4	75.4	70.2	63.0
2Y	126.6	129.4	124.8	115.3	109.1	103.4	94.2
5Y	198.8	196.6	192.9	184.5	177.5	169.5	153.6
10Y	251.1	249.6	248.6	245.7	239.7	234.0	213.1

Source: BofA Merrill Lynch Global Research

Table 18: Breakeven Widths for Costless Payer Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	9.3	14.3	15.8	16.4	16.1	16.0	14.9
3M	17.6	25.9	28.4	30.3	29.7	29.2	27.0
6M	32.7	41.5	42.9	44.6	43.9	43.5	40.7
1Y	59.5	65.0	65.3	67.5	67.0	66.9	61.5
2Y	99.5	104.5	104.8	104.6	102.2	100.2	91.7
5Y	191.2	189.9	187.9	182.8	178.4	174.0	152.2
10Y	278.7	275.0	270.5	260.7	251.6	241.8	207.2

Source: BofA Merrill Lynch Global Research

Table 19: 3m Z-Score for Receiver Skew (w/o directionality with forwards and ATM)

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

Source: BofA Merrill Lynch Global Research

Table 20: 3m Z-Score for Payer Skew (w/o directionality with forwards and ATM)

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.2	-0.5	-0.5	-0.1	-0.1	-0.1	-0.2
3M	-0.5	0.3	0.4	0.5	0.2	0.5	1.0
6M	0.4	0.8	0.2	0.0	0.1	-0.3	-1.1
1Y	0.5	0.3	-0.1	-0.6	-0.5	-0.5	-0.9
2Y	-0.3	-0.5	-0.5	-0.1	-0.2	-0.6	1.1
5Y	-1.7	-1.9	-2.0	-2.0	-2.2	-1.9	-2.3
10Y	0.7	0.6	0.6	0.5	0.3	0.6	-0.2

Source: BofA Merrill Lynch Global Research

Table 21: Ratio of Payer/Receiver BE widths for Costless Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	80%	84%	86%	87%	91%	94%	95%
3M	72%	75%	81%	88%	90%	92%	93%
6M	74%	77%	78%	84%	87%	91%	96%
1Y	77%	75%	79%	86%	89%	95%	98%
2Y	79%	81%	84%	91%	94%	97%	97%
5Y	96%	97%	97%	99%	100%	103%	99%
10Y	111%	110%	109%	106%	105%	103%	97%

Source: BofA Merrill Lynch Global Research

Table 22: 3m Z-Score Ratio of Payer/Receiver Skew

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.3	0.7	1.0	-0.2	0.2	-0.3	0.2
3M	0.3	0.5	0.5	-0.5	-0.6	-0.9	-0.9
6M	0.8	1.0	0.3	-0.6	-0.8	-1.2	-1.0
1Y	1.5	0.3	-0.2	-0.9	-1.1	-1.0	-0.9
2Y	-0.5	-0.5	-0.8	-1.3	-1.3	-1.6	-1.4
5Y	-2.5	-2.8	-2.8	-2.8	-3.9	-1.0	-0.3
10Y	0.3	0.3	0.2	0.2	0.3	0.4	-0.3

Source: BofA Merrill Lynch Global Research

# Conditional Curve Trades

**Table 23: Bull Flatteners (pickup to forwards for ATM)**

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-2.0	-0.5	1.3	1.5	3.2	1.7
6M	-1.7	0.7	3.2	2.0	4.6	2.6
1Y	0.1	3.2	7.3	3.2	7.3	4.4
1.5Y	2.6	6.9	12.0	4.6	9.9	5.6
2Y	4.9	10.3	16.6	5.8	12.2	6.9

Source: BofA Merrill Lynch Global Research

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

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-1.6	1.9	5.4	3.4	6.7	3.6
6M	-1.1	3.4	8.1	4.4	8.9	5.0
1Y	1.9	7.1	13.0	5.6	11.4	6.5
1.5Y	5.0	11.2	17.9	6.7	13.8	7.7
2Y	7.2	14.2	21.8	7.7	15.9	8.7

Source: BofA Merrill Lynch Global Research

**Table 25: Bull Steepener (pickup to forwards for ATM)**

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	2.0	0.5	-1.3	-1.5	-3.2	-1.7
6M	1.7	-0.7	-3.2	-2.0	-4.6	-2.6
1Y	-0.1	-3.2	-7.3	-3.2	-7.3	-4.4
1.5Y	-2.6	-6.9	-12.0	-4.6	-9.9	-5.6
2Y	-4.9	-10.3	-16.6	-5.8	-12.2	-6.9

Source: BofA Merrill Lynch Global Research

**Table 26: Bull Steepener (pickup to forwards for -25bp OTM)**

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	1.6	-1.9	-5.4	-3.4	-6.7	-3.6
6M	1.1	-3.4	-8.1	-4.4	-8.9	-5.0
1Y	-1.9	-7.1	-13.0	-5.6	-11.4	-6.5
1.5Y	-5.0	-11.2	-17.9	-6.7	-13.8	-7.7
2Y	-7.2	-14.2	-21.8	-7.7	-15.9	-8.7

Source: BofA Merrill Lynch Global Research

**Table 27: Bear Flatteners (pickup to forwards for ATM)**

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	1.9	0.3	-1.2	-1.5	-3.0	-1.7
6M	1.5	-0.5	-3.2	-2.1	-4.6	-2.6
1Y	-0.1	-3.2	-7.3	-3.0	-7.1	-4.2
1.5Y	-2.4	-6.7	-11.8	-4.4	-9.7	-5.6
2Y	-4.5	-10.0	-16.2	-5.6	-12.0	-6.7

Source: BofA Merrill Lynch Global Research

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

+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	6.6	4.4	1.1	-2.1	-5.0	-3.0
6M	3.0	0.7	-3.0	-2.2	-6.0	-3.8
1Y	0.9	-2.0	-7.7	-3.0	-8.7	-5.8
1.5Y	-1.9	-6.5	-13.4	-4.8	-11.6	-7.1
2Y	-4.5	-10.6	-18.4	-6.3	-14.4	-8.5

Source: BofA Merrill Lynch Global Research

**Table 29: Bear Steepener (pickup to forwards for ATM)**

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-1.9	-0.3	1.2	1.5	3.0	1.7
6M	-1.5	0.5	3.2	2.1	4.6	2.6
1Y	0.1	3.2	7.3	3.0	7.1	4.2
1.5Y	2.4	6.7	11.8	4.4	9.7	5.6
2Y	4.5	10.0	16.2	5.6	12.0	6.7

Source: BofA Merrill Lynch Global Research

**Table 30: Bear Steepener (pickup to forwards for +25bp OTM)**

+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-6.6	-4.4	-1.1	2.1	5.0	3.0
6M	-3.0	-0.7	3.0	2.2	6.0	3.8
1Y	-0.9	2.0	7.7	3.0	8.7	5.8
1.5Y	1.9	6.5	13.4	4.8	11.6	7.1
2Y	4.5	10.6	18.4	6.3	14.4	8.5

Source: BofA Merrill Lynch Global Research

# Forward Volatility

Table 31: 6m Forward Volatility

	1y	2y	5y	10y	30y
1m	54.3	63.4	67.5	64.7	59.5
3m	60.6	66.8	68.7	65.4	59.8
6m	63.4	69.7	70.3	66.6	60.8
1y	65.1	74.0	72.4	67.8	61.9
2y	79.6	81.6	76.7	70.7	63.9
5y	82.6	81.7	77.4	72.1	63.8
10y	73.7	73.0	70.8	66.4	58.9

Source: BofA Merrill Lynch Global Research

Table 32: 6m fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	155%	121%	114%	117%	116%
3m	155%	119%	113%	114%	113%
6m	129%	114%	110%	110%	110%
1y	106%	109%	107%	106%	106%
2y	107%	106%	105%	104%	104%
5y	102%	101%	101%	101%	101%
10y	99%	99%	100%	100%	100%

Source: BofA Merrill Lynch Global Research

Table 33: 3m Z-Scores of 6m fwd vol % ATM

	1y	2y	5y	10y	30y
1m	1.0	0.3	0.3	0.5	0.5
3m	0.8	0.0	0.2	0.4	0.5
6m	0.1	-0.1	0.2	0.3	0.4
1y	0.0	0.1	0.2	0.3	0.3
2y	0.2	0.2	0.2	0.2	0.3
5y	0.2	0.2	0.2	0.2	0.2
10y	0.2	0.2	0.2	0.2	0.2

Source: BofA Merrill Lynch Global Research

Table 34: 1y Forward Volatility

	1y	2y	5y	10y	30y
1m	61.7	70.4	70.4	66.2	61.0
3m	70.6	76.6	73.1	68.0	62.1
6m	71.7	78.8	74.5	69.0	62.9
1y	73.3	82.0	76.6	70.7	64.2
2y	83.7	84.6	78.9	72.3	64.9
5y	82.7	81.8	77.7	72.3	63.7
10y	73.1	72.5	70.3	65.9	58.5

Source: BofA Merrill Lynch Global Research

Table 35: 1y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	176%	134%	119%	119%	118%
3m	180%	136%	120%	119%	118%
6m	146%	128%	116%	114%	113%
1y	120%	120%	113%	111%	110%
2y	112%	109%	108%	107%	105%
5y	102%	102%	102%	102%	101%
10y	98%	99%	99%	99%	99%

Source: BofA Merrill Lynch Global Research

Table 36: 3m Z-Scores of 1y fwd vol % ATM

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

Source: BofA Merrill Lynch Global Research

Table 37: 2y Forward Volatility

	1y	2y	5y	10y	30y
1m	69.3	78.0	77.2	71.5	64.9
3m	81.0	84.7	80.3	73.2	65.5
6m	80.5	84.8	80.7	73.3	65.5
1y	75.6	84.1	80.8	73.5	65.4
2y	84.8	87.4	81.8	74.4	65.4
5y	82.0	81.5	77.7	72.0	62.7
10y	71.5	70.9	69.0	64.5	57.1

Source: BofA Merrill Lynch Global Research

Table 38: 2y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	198%	148%	131%	129%	126%
3m	207%	151%	132%	128%	124%
6m	164%	138%	126%	122%	118%
1y	124%	124%	119%	115%	112%
2y	114%	113%	112%	110%	106%
5y	101%	101%	102%	101%	99%
10y	96%	96%	97%	97%	97%

Source: BofA Merrill Lynch Global Research

Table 39: 3m Z-Scores of 2y fwd vol % ATM

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

Source: BofA Merrill Lynch Global Research

Table 40: 3y Forward Volatility

	1y	2y	5y	10y	30y
1m	26.1	62.7	75.1	71.3	64.0
3m	73.8	80.9	81.2	74.5	65.2
6m	74.9	82.9	81.8	74.8	65.3
1y	76.0	84.8	82.3	75.3	65.4
2y	86.4	87.7	83.0	75.8	65.2
5y	81.3	80.9	77.4	71.6	61.5
10y	69.8	69.2	67.7	63.1	55.7

Source: BofA Merrill Lynch Global Research

Table 41: 3y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	74%	119%	127%	129%	124%
3m	188%	144%	133%	130%	124%
6m	153%	135%	128%	124%	118%
1y	124%	125%	121%	118%	112%
2y	116%	113%	114%	112%	106%
5y	100%	100%	101%	101%	97%
10y	94%	94%	95%	95%	94%

Source: BofA Merrill Lynch Global Research

Table 42: 3m Z-Scores of 3y fwd vol % ATM

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

Source: BofA Merrill Lynch Global Research

Table 43: 5y Forward Volatility

	1y	2y	5y	10y	30y
1m	10.3	57.6	74.5	71.5	62.6
3m	77.5	80.6	81.9	75.3	64.1
6m	78.0	81.0	82.1	75.0	63.9
1y	80.2	82.7	82.3	74.6	63.4
2y	81.6	84.1	81.1	72.9	62.1
5y	77.2	76.8	74.3	69.2	58.2
10y	65.9	65.5	64.9	60.4	52.9

Source: BofA Merrill Lynch Global Research

Table 44: 5y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	29%	110%	126%	129%	122%
3m	198%	144%	135%	132%	122%
6m	159%	132%	128%	124%	115%
1y	131%	121%	121%	117%	109%
2y	109%	109%	111%	108%	101%
5y	95%	95%	97%	97%	92%
10y	89%	89%	91%	91%	89%

Source: BofA Merrill Lynch Global Research

Table 45: 3m Z-Scores of 5y fwd vol % ATM

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

Source: BofA Merrill Lynch Global Research

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