



07 January 2019

### Views and flows

After the last Fed meeting it is clear that 2.8% is the new 3%, and we expect the backend of the curve and the right side of the grid to be rather anchored by the lower neutral rate expectations. A more data dependent Fed on the other hand supports slightly higher volatility on the left side of the grid. An analysis of curve directionality (see Chart 4) is starting to reveal this new reality, with recent moves skewed towards a bull-steepening/bear-flattening dynamic that supports left side volatility.

Flow-wise, we saw some interest in conditional bearish structures in the belly, and indications of selling of volatility in intermediate expiries on the right side of the grid, and some rebalancing of Bermudan books in the rally.

### Relative value

The volatility curves are inverted virtually across the grid, with the peak of inversion at 2y expiries. Yet, the belly managed to outperform slightly versus the wings last week in a context of significant data driven volatility (see Table 3).

Although on a PCA framework the left side looks generally rich (see Table 5 and Table 7), when one takes into account the directionality with rates that richness all but disappears (see Table 6 and Table 8) implying still some scope for outperformance relative to the right side. This view is reinforced by cheapness of implied to delivered ratios on the left side of the grid (see Table 13 and Table 14).

Receiver skew looks rich relative to payer skew virtually across the grid (see Table 21), but Z-Scores show this richness to be more pronounced (versus the recent history) on the right side of the grid (see 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).

Forward volatility looks cheap across expiries, with the cheapness particularly relevant around the 2y2y forwards (see Table 36).

### Trade recommendations

We think there is scope for rates to fade some of the recent risk off premium, and we continue to like expressing this view through 6m5y payer spreads (a/a+25bp). On the curve we like to fade the recent steepening of the 5s30s sector. To overcome the give up, we favor expressing the view by buying 6m5y payer spreads a/a+55bp financed by selling 6m30y payers. The 27bp entry level of the trade is flat to the forwards, and carry is positive by roughly 1.5bp/6m. The main risk on the position is a bear-steepening scenario of the curve with potentially unlimited downside. Because we are selling the high strike on the 5y leg, the position is also exposed to downside on selloff beyond that strike, even in a bear flattening scenario.

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Timestamp: 07 January 2019 03:16PM EST

# Levels and Recent Moves

Table 1: ATM Normal Volatility Grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	49.2	65.2	70.1	72.2	68.5	67.2	63.8
3M	51.1	66.8	69.0	69.9	66.9	65.6	62.0
6M	56.7	68.5	70.3	71.0	68.6	66.9	62.9
1Y	67.6	74.4	74.2	74.2	71.9	69.4	64.6
2Y	81.2	83.3	81.6	77.8	75.0	71.9	65.8
3Y	84.3	84.3	82.7	78.8	76.1	73.1	66.2
4Y	84.5	84.1	82.6	79.0	76.4	73.5	66.0
5Y	84.3	83.5	82.1	78.7	76.3	73.6	65.6
10Y	75.6	74.5	73.7	72.0	69.8	67.6	60.2
30Y	53.3	52.7	52.4	51.7	50.7	49.4	46.6

Source: BofA Merrill Lynch Global Research

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

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	1.5	1.5	1.8	2.0	1.5	1.4	1.0
3M	1.3	1.7	1.7	1.8	1.5	1.4	0.9
6M	1.4	1.7	1.7	1.7	1.7	1.4	1.1
1Y	1.5	1.6	1.7	1.9	1.8	1.4	1.1
2Y	1.5	1.6	1.7	1.8	1.6	0.7	0.2
3Y	1.2	1.1	1.3	1.7	1.4	0.6	0.1
4Y	0.9	1.0	1.1	1.3	1.0	0.5	0.0
5Y	1.2	1.1	1.1	1.1	0.9	0.5	0.2
10Y	1.6	1.3	1.3	0.9	0.8	0.8	0.7
30Y	-0.4	-0.4	-0.1	0.2	0.4	0.4	0.3

Source: BofA Merrill Lynch Global Research

Table 3: ATM Normal Volatility Grid - CoW

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.5	-0.9	0.8	1.6	-1.1	-1.1	-3.1
3M	-2.9	-0.3	0.1	0.3	-1.3	-1.3	-1.9
6M	-1.8	-0.7	-0.3	-0.1	-0.9	-0.9	-0.8
1Y	-0.7	-0.1	-0.1	-0.1	-0.2	-0.4	-0.4
2Y	-0.8	-0.4	-0.3	-0.2	-0.4	-0.6	-0.7
3Y	-0.8	-0.8	-0.7	-0.4	-0.4	-0.5	-0.4
4Y	-1.0	-1.0	-0.8	-0.5	-0.6	-0.6	-0.6
5Y	-0.5	-0.5	-0.5	-0.5	-0.5	-0.6	-0.5
10Y	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2
30Y	-0.9	-0.7	-0.5	-0.1	0.1	0.0	0.0

Source: BofA Merrill Lynch Global Research

Table 4: Straddle premiums

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.1%	0.3%	0.5%	0.8%	1.0%	1.3%	2.9%
3M	0.2%	0.5%	0.8%	1.3%	1.7%	2.3%	4.9%
6M	0.3%	0.7%	1.1%	1.8%	2.4%	3.2%	7.0%
1Y	0.5%	1.1%	1.7%	2.7%	3.5%	4.7%	10.1%
2Y	0.9%	1.7%	2.5%	3.9%	5.1%	6.7%	14.2%
3Y	1.1%	2.1%	3.1%	4.7%	6.2%	8.2%	17.2%
4Y	1.2%	2.4%	3.4%	5.3%	7.0%	9.2%	19.3%
5Y	1.3%	2.6%	3.7%	5.8%	7.6%	10.1%	20.9%
10Y	1.5%	2.8%	4.2%	6.6%	8.7%	11.5%	24.0%
30Y	1.1%	2.1%	3.1%	5.0%	6.6%	8.9%	20.1%

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



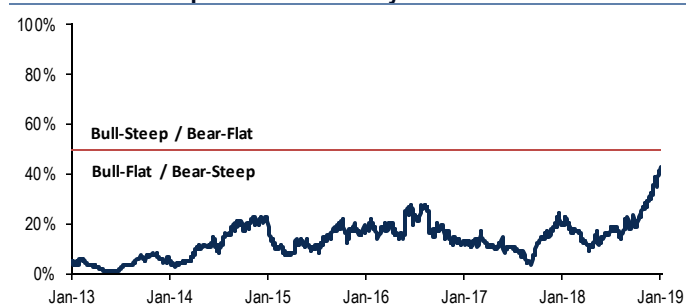
Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 3: 3m10y vs. 3m2y Normal Volatility



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 4: 2s10s Swap 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	-2.8	2.4	1.0	0.9	-1.4	-1.2	-1.1
6m	-2.3	1.4	0.4	0.4	-0.6	-0.8	-0.4
1y	-0.8	0.5	1.2	1.3	1.1	0.9	0.5
2y	-0.4	0.8	1.0	0.7	0.6	-0.2	-0.5
5y	-0.8	-1.1	-1.1	-0.4	-0.4	-1.1	-1.4
10y	1.2	1.0	1.0	0.8	0.6	0.4	0.3

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	-3.1	2.5	1.5	1.5	-0.5	-0.1	-1.4
6m	-2.9	1.0	0.3	0.8	0.4	0.0	-1.3
1y	-0.8	0.7	1.3	1.6	2.0	0.3	-0.3
2y	0.3	1.2	1.6	1.6	0.7	-0.5	-0.9
5y	-0.2	-0.3	-0.4	-0.4	-0.6	-0.7	-0.9
10y	0.8	0.4	0.2	0.0	-0.1	-0.2	-0.1

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	-1.4	1.3	1.4	2.5	2.3	2.0	0.9
6m	-1.2	0.9	-0.5	1.3	0.8	-1.7	-1.1
1y	1.5	1.0	0.5	0.3	-1.7	-2.4	-2.3
2y	0.6	-0.3	0.1	-2.0	-1.2	-1.2	-2.8
5y	0.0	-2.2	-2.0	-0.5	-0.7	-0.1	-2.1
10y	1.5	1.5	0.1	0.4	0.7	-0.6	0.2

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	-0.8	-0.8	-0.5	-0.7	-0.4	-0.3
6m	-1.6	-0.9	-0.9	-0.7	-0.7	-0.4	0.0
1y	-1.1	-0.7	-0.5	-0.3	-0.1	0.1	0.3
2y	-1.0	-0.7	-0.8	-0.3	-0.3	-0.1	-0.1
5y	-0.9	-1.0	-1.0	-0.8	-0.7	-0.8	-0.7
10y	0.3	0.1	0.0	0.0	-0.1	-0.2	-0.1

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	-1.0	-0.7	-0.1	-0.2	0.0	-0.1
6m	-2.1	-1.2	-1.0	-0.5	-0.1	0.1	0.0
1y	-1.5	-0.9	-0.8	-0.2	0.2	0.3	0.3
2y	-1.0	-0.7	-0.7	-0.3	-0.1	0.0	-0.3
5y	-1.2	-1.3	-1.4	-1.1	-1.0	-0.8	-0.9
10y	0.3	0.1	-0.2	-0.3	-0.4	-0.5	-0.2

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	2.8	3.4	3.2	3.1	2.7	2.5	2.3
6m	3.1	3.3	3.1	2.9	2.6	2.3	2.1
1y	3.3	3.3	3.2	3.1	2.8	2.3	2.3
2y	3.5	3.5	3.5	3.1	2.9	2.4	2.3
5y	3.3	3.1	3.1	3.1	2.9	2.6	2.5
10y	2.8	2.8	2.8	2.7	2.6	2.5	2.7

Source: BofA Merrill Lynch Global Research

## IMPLIED/DELIVERED RATIOS

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

	1y	2y	3y	5y	7y	10y	30y
1m	87%	84%	83%	88%	90%	93%	113%
3m	76%	80%	78%	84%	86%	90%	109%
6m	70%	75%	76%	84%	88%	92%	110%
1y	69%	75%	80%	87%	92%	96%	113%
2y	79%	90%	93%	99%	101%	104%	117%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
1m	121%	117%	115%	120%	118%	120%	129%
3m	106%	110%	108%	113%	113%	116%	124%
6m	96%	103%	105%	112%	114%	117%	125%
1y	95%	103%	108%	115%	118%	120%	128%
2y	109%	121%	123%	127%	127%	128%	131%

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	-2.9	-3.4	-3.6	-3.1	-2.3	-1.8	-0.9
3m	-2.8	-3.2	-4.1	-3.2	-2.3	-1.8	-1.0
6m	-2.7	-3.5	-4.3	-3.3	-2.3	-1.9	-1.1
1y	-3.4	-3.9	-4.3	-2.7	-2.0	-1.7	-1.0
2y	-4.1	-3.6	-2.5	-1.8	-1.6	-1.5	-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	-1.1	-1.2	-1.5	-0.9	-0.7	-0.3	0.6
3m	-2.1	-1.8	-2.5	-1.9	-1.6	-0.9	0.3
6m	-2.8	-3.4	-3.7	-2.7	-1.9	-1.3	0.2
1y	-4.2	-4.1	-4.6	-3.2	-1.9	-1.4	0.2
2y	-4.3	-4.0	-2.7	-1.7	-1.1	-0.8	0.0

Source: BofA Merrill Lynch Global Research

# Skew Relative Value

Table 15: Skew 25% delta

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	4.2	5.1	5.2	4.8	4.0	3.2	2.8
3M	6.3	7.4	6.6	5.0	4.4	3.6	3.2
6M	7.2	8.2	7.6	6.0	5.1	4.0	2.8
1Y	8.2	9.5	8.1	5.6	4.6	3.2	2.3
2Y	6.7	6.4	5.5	3.8	3.3	2.5	2.3
5Y	3.5	3.4	3.3	2.9	2.6	2.1	2.6
10Y	2.4	2.5	2.7	3.1	3.2	3.4	3.8
30Y	5.4	5.5	5.6	6.0	6.0	6.2	6.6

Source: BofA Merrill Lynch Global Research

Table 16: Skew 75% delta

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-2.7	-2.9	-2.7	-2.1	-1.4	-0.5	-0.2
3M	-4.3	-4.5	-3.1	-1.1	-0.6	0.2	0.5
6M	-2.8	-2.6	-2.7	-1.5	-0.7	0.5	1.0
1Y	-2.3	-3.2	-3.1	-1.1	-0.2	1.1	1.1
2Y	-2.6	-2.0	-1.1	0.7	1.2	1.8	1.7
5Y	2.7	2.8	2.9	3.2	3.3	3.6	2.6
10Y	6.6	6.4	6.1	5.6	5.3	4.9	3.7
30Y	9.5	9.2	9.0	8.5	8.1	7.7	6.5

Source: BofA Merrill Lynch Global Research

Table 17: Breakeven Widths for Costless Receiver Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	16.6	21.7	23.1	23.4	21.7	21.0	19.9
3M	32.9	42.1	41.9	40.4	37.9	36.8	34.3
6M	52.7	62.5	62.4	60.0	56.8	53.4	48.3
1Y	87.1	96.6	92.6	86.3	81.4	76.7	69.6
2Y	136.1	137.7	132.5	121.8	116.0	108.4	99.5
5Y	205.3	203.0	199.0	189.9	182.8	174.7	159.0
10Y	253.5	250.8	249.8	246.9	240.9	235.2	214.8

Source: BofA Merrill Lynch Global Research

Table 18: Breakeven Widths for Costless Payer Ladders

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	12.9	17.4	18.9	19.8	19.0	19.1	18.2
3M	22.3	30.2	32.1	34.3	33.1	33.2	31.6
6M	36.8	45.6	46.9	48.9	48.2	48.5	46.4
1Y	63.9	69.1	69.5	73.3	72.3	72.2	67.7
2Y	109.7	114.0	113.9	113.4	109.8	107.3	97.9
5Y	199.3	198.0	195.7	189.9	185.5	181.2	159.0
10Y	285.8	280.6	276.0	266.1	256.7	246.8	214.3

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	0.0	0.3	0.2	0.1	0.7	0.3	0.9
3M	0.7	-0.2	-0.3	0.2	0.3	0.0	0.7
6M	-0.7	-1.1	-0.9	-1.5	-1.4	-0.6	-0.6
1Y	-0.6	-1.1	-1.4	-1.3	-1.6	-2.2	-0.9
2Y	-2.4	-2.5	-2.6	-2.9	-2.2	-2.7	-1.7
5Y	-2.2	-2.0	-2.0	-2.2	-1.1	0.7	0.5
10Y	0.9	0.9	0.9	0.6	0.5	0.4	0.0

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	0.1	0.3	0.6	0.7	1.0	1.1	0.7
3M	-0.4	0.3	0.3	0.8	0.7	1.7	1.3
6M	-1.5	-0.4	-0.5	1.0	1.3	1.4	0.2
1Y	-1.7	-0.2	-0.3	-0.2	0.9	0.7	0.3
2Y	1.3	1.1	1.2	2.0	3.1	2.3	0.7
5Y	2.7	-0.1	-0.2	-0.5	-1.3	-2.0	-1.9
10Y	-1.8	-1.7	-1.8	-2.0	-2.1	-2.1	-1.6

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	78%	80%	82%	85%	88%	91%	91%
3M	68%	72%	76%	85%	88%	90%	92%
6M	70%	73%	75%	82%	85%	91%	96%
1Y	73%	72%	75%	85%	89%	94%	97%
2Y	81%	83%	86%	93%	95%	99%	98%
5Y	97%	98%	98%	100%	101%	104%	100%
10Y	113%	112%	110%	108%	107%	105%	100%

Source: BofA Merrill Lynch Global Research

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

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.6	-0.5	-0.9	-1.2	-1.1	-1.3	-1.4
3M	-0.7	-0.4	-0.9	-1.4	-1.4	-1.5	-1.5
6M	-0.4	-0.3	-0.9	-1.4	-1.5	-1.6	-1.5
1Y	0.6	-0.8	-1.4	-1.4	-1.4	-1.7	-1.3
2Y	0.1	0.1	-0.1	-0.6	-1.2	-1.1	-1.2
5Y	0.0	0.0	-0.1	-0.1	0.8	1.0	1.3
10Y	1.6	1.6	1.6	1.5	1.5	1.6	2.0

Source: BofA Merrill Lynch Global Research

# Conditional Curve Trades

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

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-1.3	0.5	1.9	1.7	3.0	1.5
6M	-1.5	0.9	3.2	2.4	4.4	2.2
1Y	0.1	3.9	7.6	3.8	7.3	3.8
1.5Y	3.4	8.1	13.0	5.2	10.1	5.2
2Y	6.2	12.2	18.3	6.5	12.8	6.7

Source: BofA Merrill Lynch Global Research

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

-25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	-0.1	3.8	6.3	4.0	6.5	2.8
6M	-0.7	4.2	7.9	4.8	8.5	4.2
1Y	2.3	8.3	13.2	6.2	11.2	5.6
1.5Y	5.8	12.6	18.7	7.3	13.8	6.9
2Y	8.5	16.3	23.5	8.5	16.3	8.5

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	1.3	-0.5	-1.9	-1.7	-3.0	-1.5
6M	1.5	-0.9	-3.2	-2.4	-4.4	-2.2
1Y	-0.1	-3.9	-7.6	-3.8	-7.3	-3.8
1.5Y	-3.4	-8.1	-13.0	-5.2	-10.1	-5.2
2Y	-6.2	-12.2	-18.3	-6.5	-12.8	-6.7

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	0.1	-3.8	-6.3	-4.0	-6.5	-2.8
6M	0.7	-4.2	-7.9	-4.8	-8.5	-4.2
1Y	-2.3	-8.3	-13.2	-6.2	-11.2	-5.6
1.5Y	-5.8	-12.6	-18.7	-7.3	-13.8	-6.9
2Y	-8.5	-16.3	-23.5	-8.5	-16.3	-8.5

Source: BofA Merrill Lynch Global Research

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

ATM	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	1.3	-0.5	-1.9	-1.7	-2.8	-1.5
6M	1.3	-0.9	-3.0	-2.2	-4.4	-2.2
1Y	-0.3	-3.8	-7.3	-3.6	-7.1	-3.8
1.5Y	-3.0	-7.9	-12.8	-5.0	-9.9	-5.2
2Y	-5.8	-12.0	-18.1	-6.3	-12.8	-6.7

Source: BofA Merrill Lynch Global Research

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

+25bp	2/5s	2/10s	2/30s	5/10s	5/30s	10/30s
3M	5.0	3.2	0.7	-1.9	-4.0	-2.2
6M	2.8	0.9	-2.1	-2.1	-5.0	-2.8
1Y	1.3	-2.4	-7.1	-3.6	-8.3	-4.8
1.5Y	-2.4	-7.9	-14.0	-5.4	-11.6	-6.5
2Y	-6.0	-13.0	-20.4	-7.3	-15.1	-8.3

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	-1.3	0.5	1.9	1.7	2.8	1.5
6M	-1.3	0.9	3.0	2.2	4.4	2.2
1Y	0.3	3.8	7.3	3.6	7.1	3.8
1.5Y	3.0	7.9	12.8	5.0	9.9	5.2
2Y	5.8	12.0	18.1	6.3	12.8	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	-5.0	-3.2	-0.7	1.9	4.0	2.2
6M	-2.8	-0.9	2.1	2.1	5.0	2.8
1Y	-1.3	2.4	7.1	3.6	8.3	4.8
1.5Y	2.4	7.9	14.0	5.4	11.6	6.5
2Y	6.0	13.0	20.4	7.3	15.1	8.3

Source: BofA Merrill Lynch Global Research

# Forward Volatility

Table 31: 6m Forward Volatility

	1y	2y	5y	10y	30y
1m	57.0	67.4	72.7	69.0	64.8
3m	65.3	72.0	74.3	69.8	65.1
6m	68.7	75.3	75.9	70.9	65.8
1y	71.5	79.8	77.3	71.7	66.0
2y	85.1	86.2	80.3	73.7	66.7
5y	85.0	84.1	79.3	73.8	65.5
10y	74.8	73.7	71.4	67.0	59.6

Source: BofA Merrill Lynch Global Research

Table 32: 6m fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	116%	103%	101%	103%	102%
3m	128%	108%	106%	106%	105%
6m	121%	110%	107%	106%	105%
1y	106%	107%	104%	103%	102%
2y	105%	104%	103%	102%	101%
5y	101%	101%	101%	100%	100%
10y	99%	99%	99%	99%	99%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m	-0.9	-1.1	-1.2	-0.9	-0.7
3m	-0.9	-1.4	-1.2	-1.0	-0.5
6m	-1.2	-1.4	-1.2	-1.0	-0.7
1y	-1.7	-1.5	-1.6	-1.4	-1.5
2y	-1.6	-2.0	-0.8	-0.8	-0.9
5y	-0.6	-0.6	-0.9	-1.3	-0.9
10y	-1.7	-1.7	-1.4	-1.2	-0.4

Source: BofA Merrill Lynch Global Research

Table 34: 1y Forward Volatility

	1y	2y	5y	10y	30y
1m	67.1	75.7	74.8	70.1	65.0
3m	77.4	82.6	77.5	71.7	65.8
6m	78.3	84.7	78.5	72.3	66.1
1y	80.3	87.8	80.3	73.4	66.5
2y	88.2	87.9	81.3	74.6	66.9
5y	84.7	83.7	79.3	73.7	65.0
10y	74.0	72.9	70.7	66.2	58.9

Source: BofA Merrill Lynch Global Research

Table 35: 1y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	136%	116%	104%	104%	102%
3m	152%	124%	111%	109%	106%
6m	138%	124%	111%	108%	105%
1y	119%	118%	108%	106%	103%
2y	109%	106%	104%	104%	102%
5y	100%	100%	101%	100%	99%
10y	98%	98%	98%	98%	98%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m	-0.4	-1.0	-1.5	-1.2	-1.0
3m	-1.0	-1.5	-1.5	-1.3	-1.0
6m	-1.3	-1.6	-1.7	-1.5	-1.6
1y	-1.1	-1.3	-1.7	-1.7	-1.9
2y	-2.0	-2.2	-1.4	-0.9	-1.0
5y	-1.3	-1.4	-1.3	-1.6	-1.3
10y	-1.8	-1.7	-1.3	-1.1	-0.5

Source: BofA Merrill Lynch Global Research

Table 37: 2y Forward Volatility

	1y	2y	5y	10y	30y
1m	72.0	80.9	79.8	73.8	66.6
3m	86.0	88.3	83.0	75.7	67.5
6m	84.8	87.4	82.9	75.8	67.6
1y	79.8	86.4	82.8	75.9	67.5
2y	87.9	90.2	83.9	76.5	67.0
5y	83.9	82.9	79.1	73.2	63.8
10y	72.3	71.2	69.3	64.8	57.4

Source: BofA Merrill Lynch Global Research

Table 38: 2y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	146%	124%	111%	110%	104%
3m	168%	132%	119%	115%	109%
6m	150%	128%	117%	113%	107%
1y	118%	116%	112%	109%	104%
2y	108%	108%	108%	106%	102%
5y	99%	99%	101%	99%	97%
10y	96%	96%	96%	96%	95%

Source: BofA Merrill Lynch Global Research

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

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

Source: BofA Merrill Lynch Global Research

Table 40: 3y Forward Volatility

	1y	2y	5y	10y	30y
1m	27.3	65.1	76.8	73.2	65.5
3m	78.8	84.5	83.4	76.6	66.8
6m	80.3	86.6	84.1	77.0	66.9
1y	81.9	88.6	84.7	77.4	66.8
2y	88.5	90.0	84.5	77.2	66.3
5y	82.8	81.8	78.3	72.3	62.0
10y	70.5	69.5	68.0	63.3	55.9

Source: BofA Merrill Lynch Global Research

Table 41: 3y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m	55%	100%	106%	109%	103%
3m	154%	127%	119%	117%	108%
6m	142%	126%	118%	115%	106%
1y	121%	119%	114%	111%	103%
2y	109%	108%	109%	107%	101%
5y	98%	98%	99%	98%	94%
10y	93%	93%	94%	94%	93%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m	-0.9	-1.1	-1.6	-1.2	-1.1
3m	-1.1	-1.5	-1.7	-1.4	-1.1
6m	-1.3	-1.8	-2.0	-1.4	-1.3
1y	-1.5	-2.1	-2.0	-1.1	-1.2
2y	-1.6	-2.1	-1.4	-0.6	-0.3
5y	-0.7	-1.0	-1.1	-1.0	-0.3
10y	-1.3	-1.2	-0.3	0.7	1.0

Source: BofA Merrill Lynch Global Research

Table 43: 5y Forward Volatility

	1y	2y	5y	10y	30y
1m		58.2	76.0	72.9	63.9
3m	77.7	81.8	83.6	76.8	65.4
6m	78.2	81.9	83.7	76.5	65.1
1y	81.0	83.7	83.9	75.9	64.5
2y	83.9	85.7	82.7	74.1	63.0
5y	78.5	77.5	74.6	69.4	58.3
10y	66.7	65.8	65.3	60.8	53.1

Source: BofA Merrill Lynch Global Research

Table 44: 5y fwd vol as % ATM

	1y	2y	5y	10y	30y
1m		89%	105%	109%	100%
3m	152%	122%	120%	117%	105%
6m	138%	120%	118%	114%	104%
1y	120%	113%	113%	109%	100%
2y	103%	103%	106%	103%	96%
5y	93%	93%	95%	94%	89%
10y	88%	88%	91%	90%	88%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m		-0.1	-1.2	-1.0	-0.8
3m	-1.0	-1.5	-1.7	-1.4	-1.0
6m	-1.2	-1.5	-1.9	-1.7	-1.3
1y	-1.2	-1.6	-2.1	-1.7	-1.5
2y	-1.4	-2.1	-2.1	-1.1	-0.8
5y	0.3	-0.2	-0.4	-0.2	0.8
10y	-0.9	-0.7	0.1	1.1	1.4

Source: BofA Merrill Lynch Global Research

Table 1: US &amp; Canada Rates Trade Book - open trades

Open trades	Entry date	Entry level	Target	Stop	Latest level	Trade rationale/Time horizon	Risk
<a href="#">Long forward CAD breakeven</a>	18-Dec-18	149	189	129	147	Market structure issues, as well as oil and global macro uncertainties.	Heightened concerns of global slow down and position unwinding
<a href="#">T 2.0 06/30/2024 vs OIS</a>	14-Dec-18	26	5	36	25.5	Normalization of unsecured and secured funding rates as the Fed shrinks their balance sheet	Reductions in repo availability, heavy reserve manager selling
<a href="#">Buy 6m2y payer sprd (atm+5bp/atm+25bp)</a>	14-Dec-18	9.5	25	-15	-5	Position for a moderate hawkish repricing of expectations	Limited to upfront premium on position
<a href="#">Long 6m5y payer vs 6m2y receiver</a>	07-Dec-18	0	25	-15	-14	Position for belly underperformance relative fwhs	Meaningful dovish repricing of Fed
<a href="#">Long 21m2y receiver vs 6m2y receiver</a>	07-Dec-18	0	50	-20	-15	Position for turn in cycle at 18-24m horizon	Dovish near-term Fed repricing
<a href="#">FRA-OIS Mar '19-March '20 steepener</a>	07-Dec-18	-1.6	6	-5.5	0.9	Fed unwind pressuring LIBOR higher	OIS repricing, Brexit downside
<a href="#">July TII 2023-2025-2028 barbell</a>	07-Dec-18	3.7	-1	6	2.95	Flattening bias in nominals, looks steep vs. history	Fed slow down, worsening in data
<a href="#">2y ASW tightener vs EUR (vs OIS)</a>	07-Dec-18	65	35	80	60	Higher fed funds, end of ECB QE	Rising US/China trade tensions
<a href="#">21m fwd 2s10s bull steepener</a>	29-Nov-18	0	30	-15	1	Bull steepening beyond the forecast horizon as market starts to price Fed cuts	Persistent inversion of the curve with the Fed on hold for longer
<a href="#">1y fwd 2s10s bearish flattener</a>	29-Nov-18	0	15	-10	-2	Flattening bias on the curve for 2019	Dovish repricing leaves curve steep
<a href="#">Buy 6m2y costless receiver ladder</a>	29-Nov-18	0	16.5	-15	-6	Attractive carry and a slightly dovish Fed scenario	Dovish repricing drives 2y rate
<a href="#">Long 6m7y USD vol vs 6m5y EUR vol, DH</a>	18-Nov-18	956K	1.5mn	500K	-350k	Dovish ECB to keep EUR rates vol low vs US/3m	policy mistake by ECB, dovish Fed
<a href="#">1y5y 25bp OTM payers</a>	18-Nov-18	77	200	0	21	Historically cheap high rate protection while R* and inflation are rising	Soft patch material enough to put the Fed on hold
<a href="#">2s10s nominal curve flattener</a>	07-Nov-18	27	0	41	12.6	Continued Fed hiking, downside risks to growth	A shift in the Fed's reaction function or unexpected fiscal policy easing.
<a href="#">1y7y receiver ladder (ATM/ATM-23/ATM-46)</a>	10-Aug-18	0k	1.4mn	-700k	-90k	An re-escalation of trade rhetoric resulting in episodic risk-off moves.	A immediate spike in vol
<a href="#">Long \$10mn ATMF 5y30y straddle, 2.88%</a>	30-Jan-18	2.1mn	4mn	1mn	1.9mn	Regulation and seasonals may tame callable issuance.	A surprise comeback in Formosa issuance.

Source: BofA Merrill Lynch Global Research. Bid/offer spreads are not accounted for in initiation and dosing levels. Does not reflect tax withholdings or any investment advisory fees. Past performance is no guarantee of future results. A complete performance record is available on request. Trade initiation and termination prices are determined at the time we publish the initiation and termination of the trade. Prices used to mark current levels of open trades in our model portfolio are taken at the time the day prior to the publication of the Global Rates and FX Weekly. Trade levels are expressed in basis points when not specified in the table. \* We are not adjusting for carry for this price

Table 47: US &amp; Canada Rates Trade Book - closed trades

Closed trades	Entry date	Entry level	Target	Stop	Close date	Level closed
<a href="#">Buy 6m5y payer spread w/ 6m5y receiver</a>	29-Nov-18	0	25	-20	07-Jan-19	-20
<a href="#">Buy T1.75 11/15/2020 vs OIS</a>	30-May-18	18	0	25	14-Dec-18	25
<a href="#">Short FFZ9</a>	30-Nov-18	270	300	255	14-Dec-18	255
<a href="#">Long 30y CAD breakevens</a>	08-Dec-17	164	195	150	13-Dec-18	147
<a href="#">Long US\$100mn 2y1y payer, 2.50%</a>	16-Nov-16	17	48	0	16-Nov-2018	42
<a href="#">RRB 2021/26 real curve steepener</a>	12-July-18	10.1	30	0	08-Nov-2018	0
<a href="#">Long TII 7/28 vs. short TII 7/20</a>	25-Oct-18	21	60	0	07-Nov-2018	16
<a href="#">Long TII 7/15/2023 v short UST 8/15/2023</a>	12-Mar-18	222	250	210	01-Nov-2018	215
<a href="#">UST 2y-10y flattener</a>	04-July-18	30	5	43	25-Oct-2018	26
<a href="#">Short FFZ9 vs FFQ8</a>	23-Feb-18	59	90	45	31-Aug-18	73
<a href="#">6m10y payer ladder (ATM/ATM+15/ATM+30)</a>	23-Feb-18	-150k	800k	-500k	16-Aug-18	Expired
<a href="#">Long UST 3% 2/48 v s UST 2.625% 2/23</a>	23-Feb-18	55	15	75	04-July-18	25
<a href="#">Short UST 2 1/20 v s OIS</a>	27-Sep-17	-3.5	20	3	24-May-18	15
<a href="#">Sell 2s-3s-5s swap butterfly</a>	01-Mar-17	-6	5	-12	26-Apr-18	6.5
<a href="#">5s10s TIPS OATei box</a>	19-Nov-17	31	0	48	20-Apr-18	58
<a href="#">6m 2s5s conditional bull steepener</a>	21-Sep-17	0k	+400k	-200k	20-Mar-18	32K
<a href="#">5s30s Libor/Funds basis flattener</a>	27-Jul-17	10	0	15	01-Mar-18	5
<a href="#">2y-10y steepener swap curve steepener</a>	19-Nov-17	44.5	85	25	22-Feb-18	47
<a href="#">6m10y 25bp OTM strangle</a>	19-Nov-17	1.23mn	2.5mn	0k	15-Feb-18	3.1mn
<a href="#">Long 3y 5s30s bear steepener &amp; 1y2y payer</a>	25-Apr-17	0	2mn	-900k	15-Feb-18	-1mn
<a href="#">1y 1y US-UK OIS widener</a>	19-Nov-17	101	150	75	15-Feb-18	125
<a href="#">Buy 30y treasuries vs matched Libor swap</a>	16-Nov-16	-56	0	-75	30-Jan-18	-14
<a href="#">Long 3m5y OTM payer at 2.38%</a>	19-Nov-17	165k	850k	0	22-Jan-18	850k
<a href="#">Long 5y breakeven</a>	02-Aug-17	1.68%	2%	1.5%	18-Jan-18	2%
<a href="#">6m5y payer ladder</a>	12-Jul-17	-100k	700k	-100k	18-Jan-18	700k
<a href="#">Receive CAD 2y</a>	19-Nov-17	180	160	190	11-Jan-18	190
<a href="#">2y 3s7s bear steepener</a>	20-Jul-17	-5k	250k	-125k	30-Nov-17	-175k
<a href="#">Buy CAN 2y note vs US 2y note</a>	19-Sep-17	16	0	24	16-Oct-17	-3
<a href="#">Short 10y TIPS</a>	16-Nov-16	35	100	0	02-Aug-17	48
<a href="#">Pay 10y inflation swap</a>	06-Sep-16	-28	40	-50	02-Aug-17	8
<a href="#">Buy 98.625 puts on EDM7</a>	01-Mar-17	4.5	15	0	01-Jun-17	0.3
<a href="#">Receive May FOMC OIS at 87bp</a>	01-Mar-17	87	81	91	3-May-17	90

Note: Bid/offer spreads not accounted for in entry and dosing levels. Does not reflect tax, withholdings or any investment advisory fees. Past performance is no guarantee of future results.

A complete performance record is available on request. Inception date – 31-Jul-14. For additional discussion on baseline views, valuation and risks to closed trades, please see links to the relevant reports.

Trade recommendations are highlighted green when the dosing value is greater than the entry value and red when the dosing value is less than or equal to the entry value. Source: BofA Merrill Lynch Global Research

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