



04 March 2019

### Views and flows

In our previous edition of Vol Views, we argued that the Treasury curve was pricing the sum of all fears (see [here](#)), and that risk reward started to be skewed towards some normalization of yields. With some of these fears fading, yields did manage to push slightly higher with the backend leading the way, and given our view for 10yT fair value around 2.85%, we think there is still some scope for slightly higher yields. Flows followed the move in volatility space with gamma on the right side leading the way higher on the grid (see Table 3) and bouncing from levels close to multi-cycle lows.

### Relative value

The Fed shift towards quasi-forward guidance changed the curve and volatility grid dynamic. We can see that clearly in the curve directionality (Chart 4), and in the performance of 3m10y vs 3m2y volatility (Chart 2). We expect this new regime to persist near term. Volatility looks fair across gamma on 1m PCA z-scores when the directionality with rates is removed (see Table 6), but continues to look cheap across the grid for longer historical windows (see Table 7 and Table 8).

Payer skew richened relative to receiver skew on short expiries in the belly of the grid (see Table 18 and Table 22). Although we expect this to persist near term, from a cycle perspective receiver skew should continue to trade rich relative to payer skew, and we should continue to see persistent sub-100% ratios in Table 21.

On conditional curves, bull steepeners and bear flatteners give up to the forwards virtually across the grid (except vs. the frontend - see Table 25 and Table 27), while bull flatteners and bear steepeners vs. the frontend show pickups that are somewhat attractive in the context of recent history (see Table 23 and Table 29).

With the recent move in right side gamma, we saw forward volatility on the right side of the grid cheapening slightly relative to ATM volatility and on 3m z-scores (Table 32).

### Trade recommendations

The 5s10s curve is at steepness levels not seen since early 2018, with the curve moves over the last month clearly biased towards bear-steepening (46% if we apply the same curve directionality methodology as in Chart 4 to the 5s10s curve). Although we see scope for further steepening in a bearish scenario, a bullish scenario may skew the dynamic towards bull flattening. We like to express this view by buying 3m10y receiver spreads atm/atm-25bp, financed by selling 3m5y receivers atm-6bp (costless indicative) and locking in an entry level for flatteners of 22bp, a pickup of 6bp to the forwards and 7bp to spot. The position is slightly short the market and short vol at inception. Carry is positive by roughly 2.5bp/m. Risks to the trade are losses in a bull steepening scenario where the market prices Fed cuts at the 3m horizon. Given that we recommend selling the low strike receiver on the 10y leg, the trade is also exposed to a selloff in 10y rates below that strike (2.52% currently), even in a bull flattening scenario.

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

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# Levels and Recent Moves

Table 1: ATM Normal Volatility Grid

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	23.9	42.4	48.8	51.6	52.1	51.6	47.1
3M	27.8	44.8	51.6	54.5	54.6	54.1	49.8
6M	36.1	49.1	54.4	56.7	56.7	56.2	52.1
1Y	52.2	59.0	60.7	61.4	60.8	60.2	55.7
2Y	65.3	67.3	66.7	66.1	65.1	64.0	58.6
3Y	69.8	70.2	69.2	67.8	66.7	65.4	59.5
4Y	72.1	72.1	71.2	69.0	67.8	66.5	60.2
5Y	72.9	72.5	71.6	69.4	68.1	66.7	60.0
10Y	69.1	68.7	68.0	66.4	65.0	63.5	57.0
15Y	63.6	63.2	62.7	61.5	60.2	58.9	54.4
30Y	52.1	51.8	51.7	51.3	50.4	49.5	49.7

Source: BofA Merrill Lynch Global Research

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

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.2	-1.2	-1.1	-1.0	-0.9	-0.9	-0.9
3M	-1.2	-1.3	-1.2	-1.2	-1.0	-1.0	-0.9
6M	-1.4	-1.5	-1.4	-1.3	-1.2	-1.1	-1.0
1Y	-1.4	-1.5	-1.4	-1.3	-1.2	-1.1	-1.0
2Y	-1.4	-1.5	-1.4	-1.4	-1.3	-1.2	-1.2
3Y	-1.5	-1.6	-1.6	-1.6	-1.5	-1.4	-1.4
4Y	-1.5	-1.6	-1.6	-1.7	-1.6	-1.4	-1.4
5Y	-1.6	-1.6	-1.7	-1.7	-1.7	-1.5	-1.5
10Y	-1.9	-1.9	-2.0	-2.1	-2.0	-1.9	-1.9
15Y	-1.4	-1.3	-1.4	-1.6	-1.3	-0.9	0.1
30Y	0.0	0.0	0.2	0.9	1.0	1.6	2.0

Source: BofA Merrill Lynch Global Research

Table 3: ATM Normal Volatility Grid - CoW

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-0.1	-0.3	0.3	0.6	1.1	1.1	1.0
3M	1.2	0.3	1.0	1.2	1.4	1.4	1.1
6M	-0.5	-0.7	0.2	0.6	0.6	0.6	0.6
1Y	0.0	-0.1	0.4	0.6	0.7	0.7	0.5
2Y	0.3	0.3	0.3	0.3	0.3	0.4	0.0
3Y	0.0	0.0	0.0	0.0	0.1	0.1	-0.1
4Y	0.0	0.0	0.0	0.0	0.1	0.1	-0.1
5Y	0.0	0.0	0.0	0.0	0.1	0.2	0.0
10Y	-0.6	-0.6	-0.6	-0.6	-0.4	-0.3	-0.3
30Y	0.7	0.7	0.7	0.7	0.8	0.9	0.8

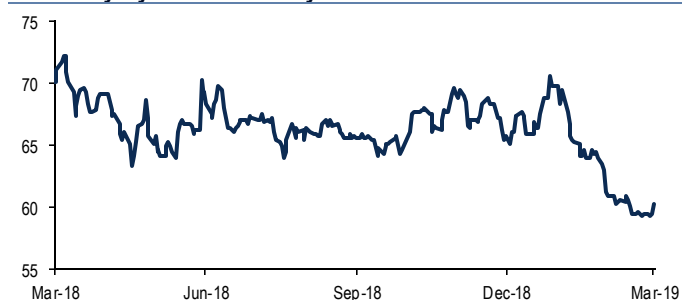
Source: BofA Merrill Lynch Global Research

Table 4: ATM Straddle Premiums

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	0.1%	0.2%	0.3%	0.6%	0.8%	1.0%	2.2%
3M	0.1%	0.3%	0.6%	1.0%	1.4%	1.9%	4.0%
6M	0.2%	0.5%	0.9%	1.5%	2.0%	2.7%	5.8%
1Y	0.4%	0.9%	1.4%	2.2%	3.0%	4.0%	8.6%
2Y	0.7%	1.4%	2.0%	3.3%	4.4%	5.9%	12.4%
3Y	0.9%	1.7%	2.5%	4.0%	5.4%	7.2%	15.1%
4Y	1.0%	2.0%	2.9%	4.6%	6.2%	8.3%	17.2%
5Y	1.1%	2.2%	3.2%	5.1%	6.8%	9.0%	18.7%
10Y	1.3%	2.6%	3.8%	6.0%	7.9%	10.6%	22.1%
30Y	1.0%	2.0%	2.9%	4.7%	6.2%	8.4%	20.1%

Source: BofA Merrill Lynch Global Research

Chart 1: 1y10y Normal Volatility



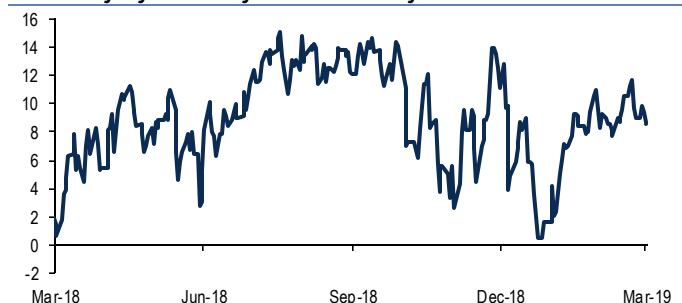
Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 2: 3m10y vs. 3m2y Normal Volatility



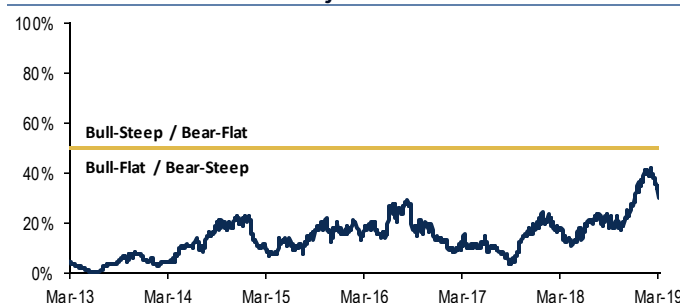
Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 3: 1y10y vs. 1m10y Normal Volatility



Source: BofA Merrill Lynch Global Research, Bloomberg

Chart 4: 2s10s curve directionality



Source: BofA Merrill Lynch Global Research

# Volatility Grid Relative Value

## PCA Z-SCORES

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

	1y	2y	3y	5y	7y	10y	30y
3m	-0.5	0.4	1.3	0.5	0.8	0.0	-1.0
6m	-0.9	-0.7	-0.7	0.3	0.4	-0.2	-1.0
1y	0.2	0.1	0.5	0.7	0.5	0.7	-0.6
2y	0.8	0.9	1.1	1.8	0.6	2.0	-1.3
5y	0.5	0.6	-0.6	-1.0	-0.4	-0.1	-0.9
10y	-0.5	-1.0	-1.2	-1.5	-1.2	-0.7	-0.8

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	0.4	0.3	0.4	0.5	0.6	0.6	0.6
6m	0.1	0.0	0.2	0.3	0.4	0.5	0.5
1y	0.2	0.1	0.2	0.3	0.3	0.5	0.5
2y	0.1	0.1	0.1	0.1	0.2	0.4	0.3
5y	-0.2	-0.2	-0.3	-0.4	-0.2	0.0	0.0
10y	-0.6	-0.6	-0.7	-0.9	-0.8	-0.7	-0.6

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
3m	1.6	1.1	1.5	1.5	1.8	1.9	1.6
6m	-1.4	-2.1	-0.7	0.5	1.2	1.2	1.5
1y	0.0	-0.3	-0.1	-0.2	0.0	0.9	1.2
2y	-0.5	-1.1	-1.2	-1.4	-1.2	-0.2	0.1
5y	-1.8	-1.8	-2.0	-2.5	-2.1	-1.6	-1.0
10y	-2.2	-2.2	-2.3	-2.7	-2.4	-2.0	-1.5

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	-1.5	-1.7	-1.5	-1.4	-1.2	-1.2	-1.1
6m	-1.9	-2.0	-1.9	-1.8	-1.7	-1.6	-1.5
1y	-1.7	-1.8	-1.8	-1.9	-1.8	-1.7	-1.6
2y	-1.9	-2.0	-2.0	-2.1	-2.0	-1.9	-1.9
5y	-2.4	-2.4	-2.4	-2.6	-2.5	-2.4	-2.2
10y	-2.8	-2.8	-2.9	-3.1	-2.9	-2.7	-2.5

Source: BofA Merrill Lynch Global Research

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

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

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	-2.7	-2.1	-2.0	-1.5	-1.5	-1.4	-1.5
6m	-2.6	-2.4	-2.3	-2.0	-2.0	-1.7	-1.7
1y	-2.1	-2.1	-2.2	-2.4	-2.1	-1.8	-1.7
2y	-2.1	-2.6	-2.9	-2.4	-2.3	-1.9	-2.0
5y	-2.8	-2.7	-2.7	-2.7	-2.5	-2.2	-1.9
10y	-1.8	-1.6	-1.6	-1.7	-1.4	-1.1	-0.7

Source: BofA Merrill Lynch Global Research

## IMPLIED/DELIVERED RATIOS

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

	1y	2y	3y	5y	7y	10y	30y
1m	94%	102%	101%	101%	103%	105%	109%
3m	87%	97%	102%	103%	105%	109%	115%
6m	87%	94%	99%	103%	106%	110%	118%
1y	91%	97%	102%	108%	112%	117%	126%
2y	103%	112%	113%	119%	123%	128%	134%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	3y	5y	7y	10y	30y
1m	60%	72%	74%	79%	84%	88%	99%
3m	56%	69%	74%	81%	86%	91%	104%
6m	58%	68%	74%	82%	88%	94%	107%
1y	67%	74%	80%	88%	94%	100%	115%
2y	79%	89%	92%	101%	106%	112%	123%

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	0.1	0.3	0.3	0.0	-0.1	-0.1	-0.3
3m	0.1	0.3	0.4	0.1	0.0	-0.1	-0.2
6m	0.3	0.2	0.3	0.0	-0.1	-0.1	-0.2
1y	0.4	0.3	0.2	0.0	-0.1	-0.1	-0.1
2y	0.2	0.0	-0.1	-0.2	-0.1	-0.1	-0.1

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	-1.0	-1.0	-1.0	-1.1	-1.0	-1.0	-1.0
3m	-1.0	-1.1	-1.1	-1.1	-1.1	-1.1	-1.0
6m	-1.1	-1.2	-1.1	-1.2	-1.2	-1.2	-1.1
1y	-1.1	-1.1	-1.1	-1.2	-1.2	-1.2	-1.1
2y	-1.2	-1.2	-1.3	-1.3	-1.3	-1.3	-1.0

Source: BofA Merrill Lynch Global Research

# Skew Relative Value

**Table 15: Skew 25% delta**

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	1.9	2.8	3.0	2.8	2.4	1.7	1.8
3M	4.0	5.2	4.8	3.3	3.0	2.4	2.7
6M	5.3	5.5	5.4	4.2	4.0	3.6	2.8
1Y	7.1	6.7	5.9	4.2	3.8	3.1	2.6
2Y	6.0	5.8	5.2	3.9	3.5	2.8	2.6
5Y	3.6	3.5	3.2	2.6	2.5	2.3	2.4
10Y	2.4	2.5	2.7	3.0	3.1	3.3	3.3
30Y	4.6	4.6	4.8	5.1	5.2	5.4	5.3

Source: BofA Merrill Lynch Global Research

**Table 16: Skew 75% delta**

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	-1.1	-1.3	-1.2	-0.8	-0.4	0.3	0.1
3M	-3.3	-3.3	-2.1	-0.1	0.3	0.9	0.3
6M	-3.6	-2.3	-1.8	-0.4	-0.2	0.2	0.8
1Y	-4.4	-3.0	-2.2	-0.3	0.1	0.7	1.0
2Y	-2.8	-2.4	-1.6	-0.1	0.3	1.0	0.9
5Y	1.0	1.2	1.5	2.1	2.2	2.3	1.8
10Y	4.6	4.5	4.3	3.8	3.6	3.3	2.7
30Y	7.2	7.1	6.9	6.5	6.2	5.9	5.5

Source: BofA Merrill Lynch Global Research

**Table 17: Breakeven Widths for Costless Receiver Ladders**

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	8.2	14.1	16.1	16.8	16.7	16.1	14.8
3M	19.3	29.2	31.7	31.3	30.7	30.3	28.2
6M	35.8	44.6	47.9	47.2	46.7	46.0	41.7
1Y	70.5	74.5	73.9	71.3	69.1	67.1	61.7
2Y	111.8	113.7	110.6	104.5	102.0	98.8	90.5
5Y	180.7	179.2	175.7	167.9	164.4	160.4	145.9
10Y	233.9	233.5	232.5	229.6	225.7	222.2	202.1

Source: BofA Merrill Lynch Global Research

**Table 18: Breakeven Widths for Costless Payer Ladders**

	1Y	2Y	3Y	5Y	7Y	10Y	30Y
1M	6.5	11.8	13.7	14.8	15.1	15.3	13.8
3M	11.8	20.3	24.5	27.7	28.2	28.5	25.6
6M	22.0	32.6	36.9	40.4	40.7	40.7	38.6
1Y	45.9	54.6	57.7	61.6	61.8	62.4	58.4
2Y	86.2	90.0	90.9	93.6	93.3	93.5	86.2
5Y	167.9	168.0	167.3	165.1	162.7	160.3	142.6
10Y	249.9	247.9	244.0	235.4	226.9	220.5	196.3

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	0.2	0.0	-0.5	-0.3	-0.7	-0.8	-0.3
3M	0.2	-0.9	-2.1	-2.5	-2.6	-2.8	-0.6
6M	0.8	0.0	-1.0	-1.7	-1.3	0.0	0.5
1Y	0.8	0.1	-1.1	-1.1	-2.5	-0.9	-0.2
2Y	0.5	0.4	0.1	-0.9	0.1	-0.3	0.1
5Y	-0.8	-1.0	-1.0	-0.8	-0.6	-0.2	-0.2
10Y	-0.7	-0.7	-0.7	-0.8	-0.8	-0.8	-1.9

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	0.4	0.4	0.4	0.5	0.0
3M	-0.9	-0.1	-0.1	0.6	0.9	2.0	-0.6
6M	-0.3	0.5	1.1	2.0	2.0	1.3	0.7
1Y	-0.6	0.5	1.1	1.7	1.6	0.8	-0.1
2Y	-1.0	-0.7	-0.6	0.3	-0.2	-0.7	-0.6
5Y	0.4	0.4	0.4	0.4	0.3	0.1	-0.2
10Y	-0.4	-0.3	-0.2	0.0	-1.0	-0.7	0.0

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%	85%	88%	91%	95%	94%
3M	61%	70%	77%	89%	92%	94%	91%
6M	61%	73%	77%	86%	87%	89%	93%
1Y	65%	73%	78%	86%	89%	93%	95%
2Y	77%	79%	82%	90%	91%	95%	95%
5Y	93%	94%	95%	98%	99%	100%	98%
10Y	107%	106%	105%	103%	101%	99%	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	0.6	1.3	1.4	1.1	1.6	2.3	0.3
3M	-1.6	-0.4	0.0	1.1	1.7	1.3	-0.6
6M	-1.5	0.2	0.7	1.8	0.6	-0.8	-0.9
1Y	-1.4	0.3	0.6	0.5	0.5	-0.5	-0.8
2Y	-1.0	-1.0	-1.2	-1.0	-1.5	-1.4	-1.3
5Y	-1.2	-1.2	-1.2	-1.2	-1.2	-1.2	-1.1
10Y	-1.2	-1.2	-1.2	-1.1	-1.5	-1.3	-0.4

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	-4.4	-4.2	-2.2	0.1	1.9	1.7
6M	-4.9	-4.3	-1.8	0.3	2.6	2.2
1Y	-2.1	-1.1	2.6	0.9	4.4	3.6
1.5Y	-0.2	1.5	6.2	1.7	6.3	4.8
2Y	1.5	3.8	9.5	2.2	8.1	6.0

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	-5.5	-3.8	-0.7	1.3	4.2	3.0
6M	-6.1	-4.7	0.1	1.1	5.4	4.4
1Y	-0.9	1.5	6.5	2.1	7.3	5.4
1.5Y	1.3	4.3	10.5	3.0	9.3	6.5
2Y	3.0	6.3	13.6	3.6	11.0	7.7

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	4.4	4.2	2.2	-0.1	-1.9	-1.7
6M	4.9	4.3	1.8	-0.3	-2.6	-2.2
1Y	2.1	1.1	-2.6	-0.9	-4.4	-3.6
1.5Y	0.2	-1.5	-6.2	-1.7	-6.3	-4.8
2Y	-1.5	-3.8	-9.5	-2.2	-8.1	-6.0

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	5.5	3.8	0.7	-1.3	-4.2	-3.0
6M	6.1	4.7	-0.1	-1.1	-5.4	-4.4
1Y	0.9	-1.5	-6.5	-2.1	-7.3	-5.4
1.5Y	-1.3	-4.3	-10.5	-3.0	-9.3	-6.5
2Y	-3.0	-6.3	-13.6	-3.6	-11.0	-7.7

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	4.0	4.0	2.1	-0.1	-1.9	-1.7
6M	4.3	4.1	1.7	-0.3	-2.4	-2.3
1Y	1.9	0.9	-2.4	-0.9	-4.4	-3.4
1.5Y	0.2	-1.4	-6.1	-1.7	-6.2	-4.6
2Y	-1.3	-3.6	-9.3	-2.2	-7.9	-5.8

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	15.4	17.3	11.4	0.9	-3.2	-3.8
6M	9.9	10.1	6.6	-0.1	-3.0	-3.0
1Y	4.8	4.2	-0.7	-0.5	-5.2	-4.6
1.5Y	1.9	0.4	-5.7	-1.5	-7.5	-6.0
2Y	-0.5	-2.6	-9.9	-2.2	-9.5	-7.3

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	-4.0	-4.0	-2.1	0.1	1.9	1.7
6M	-4.3	-4.1	-1.7	0.3	2.4	2.3
1Y	-1.9	-0.9	2.4	0.9	4.4	3.4
1.5Y	-0.2	1.4	6.1	1.7	6.2	4.6
2Y	1.3	3.6	9.3	2.2	7.9	5.8

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	-15.4	-17.3	-11.4	-0.9	3.2	3.8
6M	-9.9	-10.1	-6.6	0.1	3.0	3.0
1Y	-4.8	-4.2	0.7	0.5	5.2	4.6
1.5Y	-1.9	-0.4	5.7	1.5	7.5	6.0
2Y	0.5	2.6	9.9	2.2	9.5	7.3

Source: BofA Merrill Lynch Global Research

# Forward Volatility

**Table 31: 6m Forward Volatility**

	1y	2y	5y	10y	30y
1m	45.9	53.1	59.5	60.0	56.7
3m	54.3	58.9	61.9	61.5	57.6
6m	57.1	61.6	63.5	62.7	58.6
1y	57.4	63.4	65.1	63.8	59.2
2y	68.5	70.2	68.5	66.4	60.7
5y	74.2	73.7	70.5	67.7	60.7
10y	69.1	68.8	66.7	63.7	57.2

Source: BofA Merrill Lynch Global Research

**Table 32: 6m fwd vol as % ATM**

	1y	2y	5y	10y	30y
1m	192%	125%	115%	116%	120%
3m	196%	132%	114%	114%	116%
6m	158%	125%	112%	112%	112%
1y	110%	107%	106%	106%	106%
2y	105%	104%	104%	104%	104%
5y	102%	102%	102%	102%	101%
10y	100%	100%	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	1.1	0.6	0.4	0.5	0.8
3m	1.2	1.0	0.4	0.5	0.8
6m	1.7	1.5	0.9	0.9	0.9
1y	1.0	-0.9	0.0	0.6	0.7
2y	-1.8	-1.3	-0.6	0.1	0.4
5y	0.8	0.8	0.7	0.8	0.9
10y	1.6	1.6	1.5	1.5	1.4

Source: BofA Merrill Lynch Global Research

**Table 34: 1y Forward Volatility**

	1y	2y	5y	10y	30y
1m	57.3	62.6	64.1	63.0	58.7
3m	61.4	65.5	65.6	63.9	59.1
6m	62.8	67.0	66.7	64.8	59.7
1y	64.3	69.1	68.3	66.3	60.8
2y	71.9	72.6	70.0	67.4	61.2
5y	74.6	74.2	70.8	68.0	60.8
10y	69.0	68.7	66.7	63.6	57.2

Source: BofA Merrill Lynch Global Research

**Table 35: 1y fwd vol as % ATM**

	1y	2y	5y	10y	30y
1m	240%	148%	124%	122%	125%
3m	221%	146%	120%	118%	119%
6m	174%	136%	118%	115%	115%
1y	123%	117%	111%	110%	109%
2y	110%	108%	106%	105%	104%
5y	102%	102%	102%	102%	101%
10y	100%	100%	100%	100%	100%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m	1.2	1.0	0.7	0.7	0.8
3m	1.2	1.0	0.5	0.6	0.7
6m	1.7	1.5	0.7	0.8	0.7
1y	0.5	-1.2	-0.2	0.6	0.5
2y	-1.0	-0.6	-0.6	-0.3	0.1
5y	0.8	0.9	0.5	0.8	0.8
10y	1.8	1.8	1.7	1.7	1.7

Source: BofA Merrill Lynch Global Research

**Table 37: 2y Forward Volatility**

	1y	2y	5y	10y	30y
1m	34.6	56.7	63.8	64.6	60.6
3m	72.6	73.5	70.2	67.7	61.6
6m	72.2	73.6	70.1	67.5	61.4
1y	69.0	73.6	70.2	67.6	61.3
2y	76.8	77.3	72.1	69.0	61.9
5y	74.3	74.0	70.7	68.0	60.3
10y	68.5	68.2	66.4	63.3	56.8

Source: BofA Merrill Lynch Global Research

**Table 38: 2y fwd vol as % ATM**

	1y	2y	5y	10y	30y
1m	145%	134%	124%	125%	129%
3m	261%	164%	129%	125%	124%
6m	200%	150%	124%	120%	118%
1y	132%	125%	114%	112%	110%
2y	118%	115%	109%	108%	106%
5y	102%	102%	102%	102%	100%
10y	99%	99%	100%	100%	100%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m	-0.9	-0.7	-0.4	0.2	0.6
3m	1.1	0.8	-0.1	0.2	0.5
6m	1.4	1.0	-0.1	0.2	0.4
1y	0.8	0.1	-0.7	-0.4	0.1
2y	0.8	0.6	-0.7	-0.5	0.2
5y	0.5	0.7	0.1	0.7	0.9
10y	2.1	2.0	2.0	2.0	2.0

Source: BofA Merrill Lynch Global Research

**Table 40: 3y Forward Volatility**

	1y	2y	5y	10y	30y
1m		38.0	59.5	62.9	59.5
3m	69.5	75.2	72.0	69.3	62.3
6m	73.6	78.4	73.3	70.2	62.7
1y	74.9	79.7	73.6	70.3	62.6
2y	78.5	78.5	73.0	69.7	61.6
5y	73.7	73.6	70.3	67.7	59.3
10y	67.5	67.3	65.8	62.6	56.2

Source: BofA Merrill Lynch Global Research

**Table 41: 3y fwd vol as % ATM**

	1y	2y	5y	10y	30y
1m		90%	115%	122%	126%
3m	250%	168%	132%	128%	125%
6m	204%	160%	129%	125%	120%
1y	143%	135%	120%	117%	112%
2y	120%	117%	110%	109%	105%
5y	101%	102%	101%	101%	99%
10y	98%	98%	99%	99%	99%

Source: BofA Merrill Lynch Global Research

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

	1y	2y	5y	10y	30y
1m		-1.1	-0.8	-0.2	0.5
3m	1.1	1.1	0.1	0.3	0.7
6m	1.6	1.6	0.4	0.6	0.8
1y	1.5	1.4	-0.2	0.1	0.6
2y	0.9	0.8	-0.8	-0.7	0.2
5y	0.5	0.7	0.1	0.6	0.9
10y	2.2	2.2	2.1	2.1	2.1

Source: BofA Merrill Lynch Global Research

**Table 43: 5y Forward Volatility**

	1y	2y	5y	10y	30y
1m		41.4	61.7	64.0	58.8
3m	67.1	72.7	73.0	69.8	61.3
6m	71.2	75.2	74.1	70.3	61.5
1y	73.0	77.0	74.7	70.4	61.5
2y	76.3	78.7	74.2	69.6	60.8
5y	71.4	71.3	68.0	66.0	56.7
10y	64.5	64.3	63.7	60.5	54.1

Source: BofA Merrill Lynch Global Research

**Table 44: 5y fwd vol as % ATM**

	1y	2y	5y	10y	30y
1m		98%	120%	124%	125%
3m	242%	163%	134%	129%	123%
6m	197%	153%	131%	125%	118%
1y	140%	131%	122%	117%	111%
2y	117%	117%	112%	109%	104%
5y	98%	98%	98%	99%	94%
10y	93%	93%	96%	95%	95%

Source: BofA Merrill Lynch Global Research

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

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

Source: BofA Merrill Lynch Global Research

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