

Volatility Watch

Global FI Strategy, 19 May 2014

With a few exceptions, the entire vol grid has been moving down quite strongly over recent weeks, the acceleration kicked by Draghi and his seeming conditional pre-commitment to June easing. An easing package looks likely unless the ECB, unlike virtually everybody else, maintains their inflation projections for 2014-16. The low for even longer mantra hit both rates and vols. *Gamma vol is flirting with all-time lows which, e.g. for 1M options, means good buying opportunities. We find gamma cheap overall.*

Vega has come down quite strongly as well, with shorter expiries (2Y in particular), correcting the most. Consequently, e.g. 5Y5Y-2Y5Y now lies near all-time highs at over 12 bpVols. Looking towards longer tails, recent pricing means the conditional 5s30s steepener in 2Y options now is cheap to enter from a vol standpoint. *We still like this trade though the curve has steepened recently (the trade has strong roll properties and is well suited for easing and low for longer).* Also, with 6M5Y-6M30Y now trading virtually flat in bpVols – the lowest in over a year – the trade can also be made in gamma receiver swaptions. The conditional 2s5s flattener we pitched last time we would take profit on. *Overall, we see vega as rich/neutral.* We find that the aforementioned slopes are extremely steep and like purchasing e.g. 2y5y vol. Very long dated volatility – the bottom right corner of the grid – also looks cheap with levels implying rather extreme low forward volatilities.

Finally, skews have reacted quite a bit to the recent rate moves, with gamma payer skews especially picking up (cf. chart 3). Though the vol levels are down, this continues to support the break-evens in 1x2 payer spreads on 1y5y (the one recommended last time is in the money due to its initial delta): Buying 100m atm vs. 200m atm+35bps can be done at zero cost. With the break-even around 1.77% this is about 100bps above the current 5Y spot.

1. Vol surface – bpVol change, z.scores in brackets

	1Y	2Y	5Y	7Y	10Y	20Y	30Y
1M	-3.1 (-1.1)	2 (-0.3)	3.3 (-0.7)	3.1 (-0.7)	2.7 (-0.8)	2 (-0.5)	1.1 (-0.5)
3M	-3.8 (-1.3)	-4.2 (-2.2)	-5.9 (-2.3)	-4.7 (-2.1)	-3.5 (-1.9)	-3.6 (-1.7)	-4.4 (-1.5)
6M	-5.7 (-2.5)	-5.5 (-2.4)	-6.4 (-2.3)	-5.9 (-2.3)	-4.8 (-2.1)	-4.2 (-1.9)	-4.3 (-1.7)
1Y	-6 (-2.7)	-7.3 (-2.7)	-5.5 (-2.2)	-5 (-2.2)	-4.2 (-2.1)	-4 (-1.9)	-3.6 (-1.7)
2Y	-5.9 (-2.3)	-6.6 (-2.3)	-5 (-2.1)	-4.1 (-2.1)	-3 (-1.9)	-2.5 (-1.7)	-2.4 (-1.6)
3Y	-6.4 (-2.2)	-6.9 (-2.2)	-4.6 (-2.1)	-3.7 (-2.1)	-3 (-2)	-2.2 (-1.8)	-2.2 (-1.6)
5Y	-6.5 (-2.5)	-5.8 (-2.4)	-4.2 (-2.3)	-3.6 (-2.2)	-2.8 (-2)	-2.3 (-1.8)	-2.5 (-1.8)
7Y	-4.4 (-2.3)	-4.1 (-2.2)	-3.6 (-2.1)	-3.1 (-2.1)	-3 (-2.2)	-2.7 (-2)	-2.5 (-2)
10Y	-2.8 (-1.7)	-2.8 (-1.8)	-2.5 (-2)	-2.7 (-2.1)	-2.9 (-2.3)	-2.6 (-2.4)	-2.5 (-2.6)
20Y	-2.7 (-2.1)	-1.7 (-1.8)	-2 (-1.9)	-2.3 (-2.2)	-2.7 (-1.4)	-2.2 (-0.9)	-2.1 (-0.5)
30Y	-2.4 (-2.1)	-2.1 (-2.1)	-1.5 (-1.4)	-1.8 (-1.1)	-1.9 (-0.6)	-1.6 (-0.4)	-2.1 (-0.6)

Z-Score value significant if absolute value > 1.96

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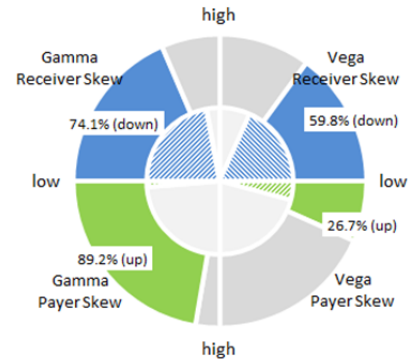
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At a glance	
Gamma	Cheap
	Cheap
1y10y (fwd prm)	421 (449)
Vega	Rich/Neutral
	Rich/Neutral
10y10y (fwd prm)	1471 (1513)
PCA (rich/cheap)	2Y30Y/30Y30Y

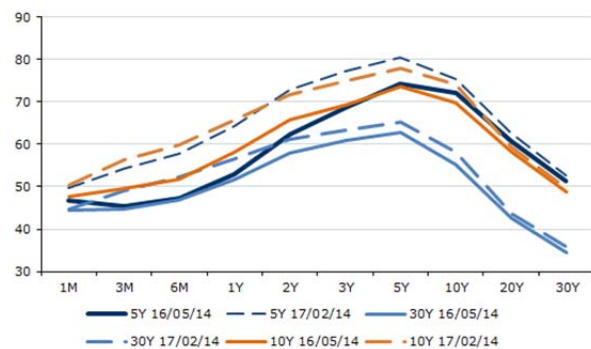
2. Implied bpVol development over the past year



3. Skew overview (current skew vs. last year)



4. bpVol term structures – Current & 3Ms ago



5. Implied/Realized bpVol ratios



6. Vol surface (bpVol)

	1Y	2Y	5Y	7Y	10Y	20Y	30Y
1M	20.0	30.0	46.7	48.0	47.7	45.9	44.4
3M	21.6	27.6	45.5	47.8	49.7	45.7	44.7
6M	21.6	29.1	47.4	49.9	51.8	48.2	47.0
1Y	25.6	34.9	52.8	55.7	58.2	53.0	51.6
2Y	47.2	52.9	62.4	64.0	65.6	60.1	58.0
3Y	63.2	65.2	68.6	68.9	69.1	63.0	60.9
5Y	74.4	74.3	74.1	73.9	73.6	65.7	62.7
7Y	76.4	75.3	73.5	73.2	72.0	63.2	59.0
10Y	74.9	73.5	71.9	71.4	69.9	60.0	55.1
20Y	62.2	61.5	60.7	59.8	58.1	46.9	42.5
30Y	54.4	52.1	51.3	50.4	48.9	38.7	34.6

7. Implied/Realised values

	2Y	5Y	10Y	30Y
Implied (daily bp)				
1m	1.89	2.94	3.01	2.80
3m	1.74	2.86	3.13	2.81
6m	1.83	2.98	3.26	2.96
Past 6M realised (daily bp)				
spot	1.29	4.38	2.64	2.33
1m	1.48	2.66	2.67	2.35
3m	1.65	2.75	2.70	2.37
6m	1.88	2.91	2.78	2.41
Implied/Realised				
1m	1.28	1.11	1.13	1.19
3m	1.05	1.04	1.16	1.19
6m	0.97	1.03	1.18	1.23

8. PCA – Relative Value (Vega grid only)

	2Y	5Y	7Y	10Y	20Y	30Y
2Y	0.00	0.54	0.81	1.15	1.71	1.84
3Y	0.10	0.65	0.66	0.79	1.30	1.51
5Y	-0.60	-0.29	0.02	0.61	1.05	0.66
7Y	0.03	0.23	0.22	-0.14	0.33	0.04
10Y	0.62	0.45	0.14	-0.49	-0.77	-1.25
20Y	0.09	-0.22	-0.73	-1.34	-1.50	-1.88
30Y	-0.10	0.34	0.00	-0.83	-1.14	-2.00

Appendix: Calculation details and model description

General:

Calculations are based on data from Nordea Markets. All quotes are end of day quotes, sampled on the trading day preceding the publication date. Volatilities are always normalized volatilities (bp vols).

1. Vol surface

The vol surface on page 1 contains changes in bpVol since last report (2 weeks). The Z-scores in parentheses are based on levels of bpVol over the past 6 months. Current bpVol grid is given in chart 6.

3. Skew overview

The pie chart illustrates the current magnitude of the skews (outer circle) and the magnitude two weeks ago (inner circle) relative to the magnitudes over the previous year. The values given are percentiles. Thus, a value of say 75% for a given skew indicates that 75% of the previous year's skews are below the current skew. The skews are calculated as $(\text{impvol}(\text{atm}-50\text{bp}) - \text{impvol}(\text{atm}))$ for the receiver skew and $(\text{impvol}(\text{atm}+50\text{bp}) - \text{impvol}(\text{atm}))$ for the payer skew. Here again, "impvol" is understood to be in terms of bp vol. The movement in the skew, relative to 2 weeks ago, is shown as "up", "down" or "unchanged". The gamma option is 6M5Y and the vega option is 5Y5Y.

4. Vol term structures

Current atm vol term structures along with those 3 months ago for 5Y, 10Y, and 30Y tails are shown. Increasing forward periods on the x-axis.

5 & 7. Implied vs. Realised vol

Implied is given as the product of the Black implied volatility and the atmf rate. Realized volatilities are estimated on daily differences of the underlying, based on data from the past six months.

8. PCA – Relative Value

The PCA Relative Value model is designed to detect temporary correlative patterns that differ from historical correlative patterns. It is applied to the historical correlation matrix of the bpVol of all swaptions, using a large data sample window spanning from 2005 to 2014. Each swaption in the grid is evaluated relative to all other swaptions. This is done by comparing each swaption movements with the movements of the market as a whole, with the latter being represented as the movements in the principal components. This gives an expression of value relative to the rest of the volatility grid. Those values, in bpVol terms, are shown in the table. A swaption that has endured movements that are relatively less (more) than what the PCA prescribes will be cheap (rich). This evaluation is based on the last 6 months of bpVol data.

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