Volatility Watch

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Rates and vols get re-priced on the back of the ECB cutting rates and initiating new bond-programs (ABS and covered bonds). And of course, on top of these endeavors the first allotments to the TLTROs is a week away, and market speculation of eventual QE is never more than minute away. On the vol grid, the low for longer shadow casts even wider and longer now, and many quotes near the top left corner are at or near all-time lows. Given the context these drops in themselves are often sensible, and we see gamma as neutral overall whereas vega is rich/neutral.

Chart 4 highlights the ECB pricing quite nicely. The front of the vol term structure on 5Y tails have been pushed down massively while the opposite is the reality on 10Y tails (where the spill-over potential from the US side is much higher). Spreads such as 1Y10Y-1Y5Y thus lie at all-time wides (19 bpVols), and delta-neutral roll positively. On 30Y tails, gamma has been bid up over the past months (chart 1), but decreases aggressively for early vega.

The vol market remains apt for taking on cautious payer positions. This can be done outright in payers or through collars which have benefitted a bit from the lowering of payer skews lately. Another opportunity lies with payer spreads: buying 1y5y atm payer swaptions vs. selling double notional atm+20bps payers gives you an upfront, initial negative delta, and an upper break-even around 1.12%. This is a trade well suited for the ECB influence short-term and with maximum terminal payoff if rates rebound modestly.

On vega the best trade lies with the term structure on 5Y tails. As is evident from chart 4, the curve is very steep from 1Y to 5Y, and in particular the outer part where 5Y5Y-3Y5Y lies at an all-time wide 13.5bpVols. Selling 5Y5Y vs. 3Y5Y straddles 1:1 gives you a large upfront, (the right type of) negative vega and a rather extreme spread considering the closeness of the expiries. The trade can also be made in payer swaptions only, for a flattening of the rate spread which has steepened over 10bps since late August.

At a glance	
Gamma	**Neutral**
	Neutral
1y10y (fwd prm)	398 (422)
Vega	**Rich/Neutral**
	Rich/Neutral
10y10y (fwd prm)	1533 (1564)
PCA (rich/cheap)	10Y2Y/2Y30Y

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

	1Y	2Y	5Y	7Y	10Y	20Y	30Y
1M	-4.9 (-0.7)	-2.2 (-0.6)	-1.3 (-0.8)	-0.1 (0)	1.8 (2.4)	6.4 (3)	4.9 (2.9)
3M	-3.7 (-0.8)	-4.2 (-1.1)	-3.3 (-1.3)	-1.5 (-0.8)	2.2 (1.7)	5.6 (3.4)	5.9 (3.3)
6M	-5.1 (-1.3)	-5.5 (-1.3)	-4 (-1.5)	-2.7 (-1.3)	0.5 (0.2)	3.8 (2.7)	3.4 (3)
1Y	-5.2 (-1.3)	-5.4 (-1.3)	-6.5 (-1.8)	-5.4 (-1.7)	-3 (-0.9)	-2.2 (0.3)	-1.8 (0.8)
2Y	-7.7 (-1.7)	-8 (-1.9)	-7.9 (-2.1)	-7 (-2)	-5.5 (-1.5)	-5.5 (-0.8)	-5.6 (-0.7)
3Y	-9 (-2.2)	-8.1 (-2.3)	-7.6 (-2.4)	-6.7 (-2.2)	-5.8 (-1.7)	-5.6 (-1.3)	-6.4 (-1.6)
5Y	-6.8 (-1.9)	-6 (-2)	-3.8 (-1.6)	-4.1 (-1.7)	-4.5 (-1.6)	-4.8 (-1.5)	-5.2 (-1.8)
7Y	-5.1 (-1.6)	-4.2 (-1.4)	-2.8 (-1.4)	-3.5 (-1.5)	-4.5 (-1.3)	-4.5 (-1.1)	-5.3 (-1.8)
10Y	-2.7 (-0.2)	-2.2 (0.1)	-2.2 (-0.1)	-2.3 (0)	-2.9 (0.3)	-2.9 (0.1)	-3.6 (-0.8)
20Y	-2.2 (0.4)	-2 (0.9)	-2.3 (0.3)	-2.4 (0.4)	-2.8 (0.5)	-1.9 (0.5)	-2.2 (-0.1)
30Y	-3.5 (-0.4)	-2.9 (-0.2)	-2.7 (-0.4)	-2.5 (-0.6)	-2.5 (-0.7)	-1.8 (-0.2)	-1.7 (-0.4)

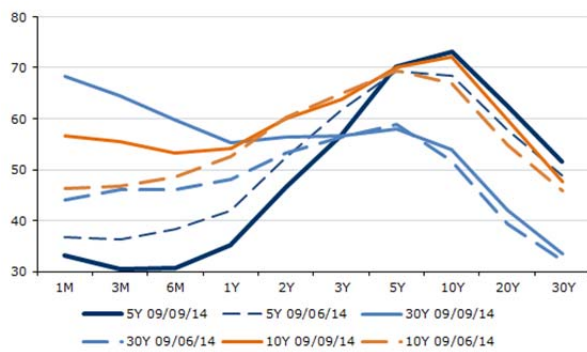Z-Score value significant if absolute value > 1.96

2. Implied bpVol development over the past year
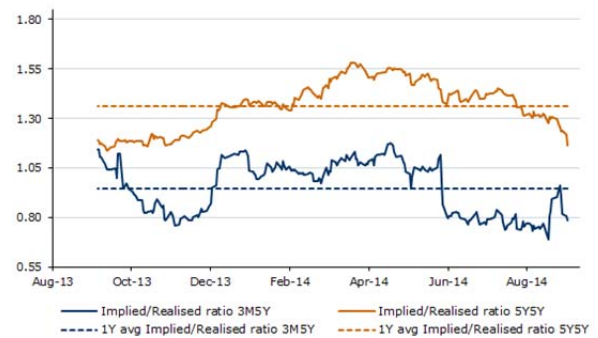

3. Skew overview (current skew vs. last year)
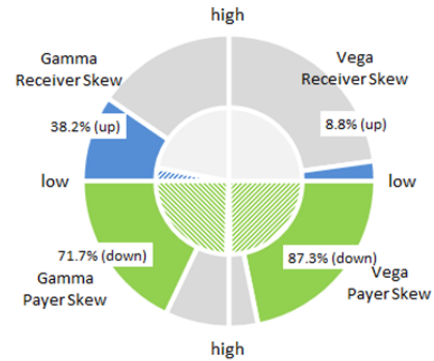
4. bpVol term structures – Current & 3Ms ago

5. Implied/Realized bpVol ratios

6. Vol surface (bpVol)

	1Y	2Y	5Y	7Y	10Y	20Y	30Y
1M	16.0	18.8	33.2	43.4	56.6	66.7	68.4
3M	15.2	16.0	30.5	40.8	55.5	62.3	64.4
6M	12.2	14.4	30.7	40.3	53.3	58.7	59.8
1Y	15.1	19.7	35.2	43.6	54.2	55.3	55.3
2Y	24.3	31.6	46.6	52.8	59.9	58.4	56.5
3Y	40.5	47.1	56.8	60.1	63.8	60.1	56.7
5Y	64.9	66.7	70.3	70.2	70.0	63.3	58.0
7Y	72.2	72.2	72.0	71.5	70.8	62.3	55.8
10Y	75.4	74.8	73.2	72.8	72.0	61.2	53.9
20Y	64.5	64.3	62.5	61.8	59.9	47.8	42.1
30Y	55.7	53.6	51.6	50.2	47.8	38.1	33.6

7. Implied/Realised values

	2Y	5Y	10Y	30Y
	Implied (daily bp)			
1m	1.19	2.09	3.57	4.31
3m	1.01	1.92	3.50	4.06
6m	0.91	1.93	3.36	3.77
	Past 6M realised (daily bp)			
spot	1.04	2.89	2.76	2.76
1m	1.17	2.37	2.81	2.78
3m	1.30	2.46	2.84	2.80
6m	1.47	2.61	2.92	2.84
	Implied/Realised			
1m	1.01	0.88	1.27	1.55
3m	0.78	0.78	1.23	1.45
6m	0.62	0.74	1.15	1.33

8. PCA – Relative Value (Vega grid only)

	2Y	5Y	7Y	10Y	20Y	30Y
2Y	0.35	-1.18	-1.08	-0.67	-2.08	-2.83
3Y	-1.69	-1.95	-1.24	-0.69	-1.81	-2.81
5Y	0.39	1.18	0.61	0.21	-1.11	-1.41
7Y	0.95	1.04	0.61	0.06	-0.87	-1.64
10Y	1.63	1.03	1.38	1.45	0.99	0.13
20Y	0.25	-0.50	0.02	0.61	0.56	0.26
30Y	-1.62	-1.31	-0.81	0.16	0.04	-0.17

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 (impvol(atm-50bp) - impvol(atm)) for the receiver skew and (impvol(atm+50bp) - impvol(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.