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Derivative Focus

CROSS-ASSET

Good risk-reward with EUR vega bear steepeners

Entering a vega-slide trade at levels rarely seen

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Quantitative Strategies

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We recommend a 5y2y1y ATMF – 5y10y20y ATMF-23bp zero-cost, dv01-neutral bear steepener. The spot spread, which closely mirrors the 2s30s slope, is now at 229bp. The significant carry priced into the curve places 5yr forwards at -3.7bp and the large vol differential makes for a strike spread of -26.7bp. Although we believe some flattening is inevitable, the significant buffer for flattening makes for a trade with a high likelihood of paying off and good carry for the next few years.

EUR 5y1y2y – 5y10y20y bear steepeners

The standard view on Europe is that curves will likely remain steep in the short run, given the relatively sluggish economy and continuing slow recovery. But this tentative recovery may also gather steam and cause the curve to flatten. In spite of this, the significant carry embedded in this bear steepening trade means that it should be able easily to withstand much more flattening than is likely to happen over the course of the next few years. We recommend the following trade:

Buy €9.3mn 5y10y20y ATMF-25bp payers and sell €55.0mn 5y1y2y ATMF payers for zero cost.

Fig. 1: Enter 5y1y2y vs 5y10y20y conditional bear steepeners for €10k/bp

EUR Bear Steepener 5y1y2y vs 5y10y20y, €10k/bp	Midcurve 5y1y2y	Midcurve	Spread (bp)
Spot	0.78%	3.06%	228.6
Forward	2.88%	2.84%	-3.8
Strike	2.88%	2.61%	-26.8
	ATMF	***ATMF-23***	***ATMF-23***
Pickup (bp)			
Fwd-Spot	-210	22	232
Vol	0	23	23
Total	**-210**	**45**	**255**
Z-Scores: Spot Vol-Normalized Pickup (no units)			
Fwd-Spot	-1.45	0.16	
Vol	0.00	0.17	
Total	**-1.45**	**0.33**	
Prob(Fwd(T)>Strike)	**7.4%**	**62.8%**	
Conditional Valuation and Premia (EUR)			
PV	695,437	695,437	0
Expected Value	579,284	677,464	98,180
Premium	**-16.7%**	**-2.6%**	

Source: Nomura Research

As we see in Figure 1, the short 5y1y2y payer leg is struck ATMF (which is 211bp above the current spot 1y2y rates), carrying negatively. Meanwhile, the long 5y10y20y ATMF-23bp is struck at 2.61%, below forwards at 2.84% and a full 45bp below spot. Combined, this makes for a total of 255.7bp of carry. We note that, given the relative vol of the 5y1y2y and the 5y10y20y (where we consider rates centred at spot with spot vol to allow us to consider the carry), the long leg has a 63% probability of expiring ITM while the

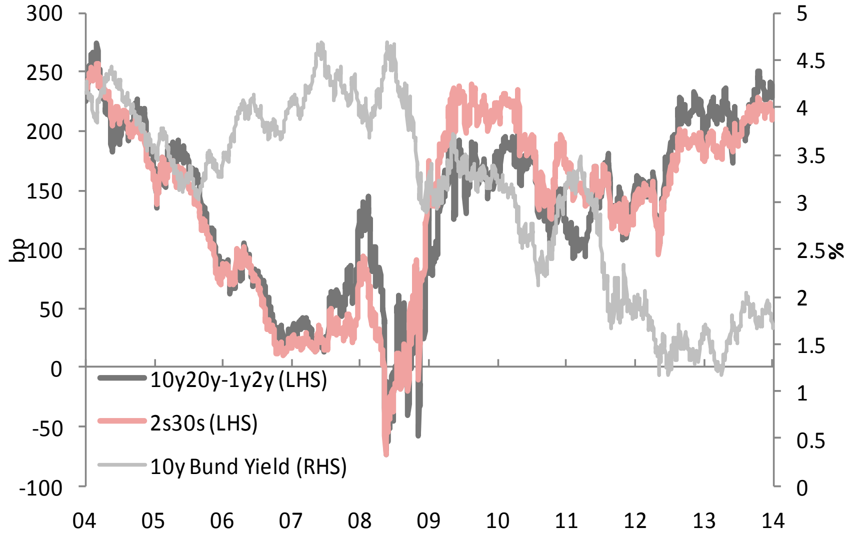
See Appendix A-1 for analyst certification, important disclosures and the status of non-US analysts.

short leg has only a 7% probability. Similarly, valuing using our basic valuation method[1], we find the short leg to have lost far more value than the long leg, resulting in a positive expected gain.

The rationale is quite straightforward. As we note in Figure 2, the 10y20y-1y2y spread mimics 2s30s. The slope does not necessarily appear level dependent as some of the steepest slopes in the past 10 years occurred when the Bund was between 3.5% and 4.5%.

Fig. 2: 10y20y-1y2y spread mirrors 2s30s slope

Negative only in the peak of the crisis with almost no relationship to levels



Source: Nomura Research, Bloomberg

More telling is the fact the curve flattened through the strikes only very briefly, during the height of the crisis. We present this past 10 years of data (2528 trading days) in Figure 3. As we note, inversions through the strikes happened on some 24-26 days, and of them, at least 17 hit -35bp and 10 hit -45bp. These were extreme times, which of course could always happen, but we note that this was during the era of Bear Stearns' problems, the mistake ECB hike of July 2008 (and subsequent severe inversion of all slopes given BuBa President Max Weber's preannouncement of the policy move) and the later Lehman bankruptcy.

Fig. 3: Percentage of days that 1y2y-10y20y inverted (over 10 years or 2528 trading days)

Inversions tend to be only extreme, and only during severe crises.

Level (bp)	Days < Level	Prob(< Level)
0	58	2.29%
-5	53	2.10%
-10	46	1.82%
-15	35	1.38%
-20	30	1.19%
-25	26	1.03%
-30	24	0.95%
-35	17	0.67%
-40	14	0.55%
-45	10	0.40%
-50	8	0.32%
-55	4	0.16%
-60	3	0.12%
-65	1	0.04%

Source: Nomura Research

Looking at the more positive side, we think it altogether likely that this trade will terminate in the money, given the significant portion of time for which slopes have remained elevated. In Figure 4, we see the fraction of history when the slopes have been steep, noting that for more than 50% of the history it has been over 150bp steep.

[1] Probabilities and expected values are computed assuming that rates are normal, centred at spot and standard deviation as the corresponding spot vol multiplied by the square root of the expiry. This basic version of a P-measure (physical as opposed to Q-measure or risk-neutral) is consistent with carry (where spot is realised) and academic research which shows that the best single predictor of realised volatility is implied volatility.

Fig. 4: 1y2y 10y20y is usually relatively steep

Mostly steepening trades would result in positive P&L

Level (bp)	Days > Level	Prob(> Level)
200	513	20.29%
175	862	34.10%
150	1249	49.41%
125	1549	61.27%
100	1770	70.02%
75	1985	78.52%
50	2153	85.17%
25	2364	93.51%
0	2470	97.71%

Source: Nomura Research

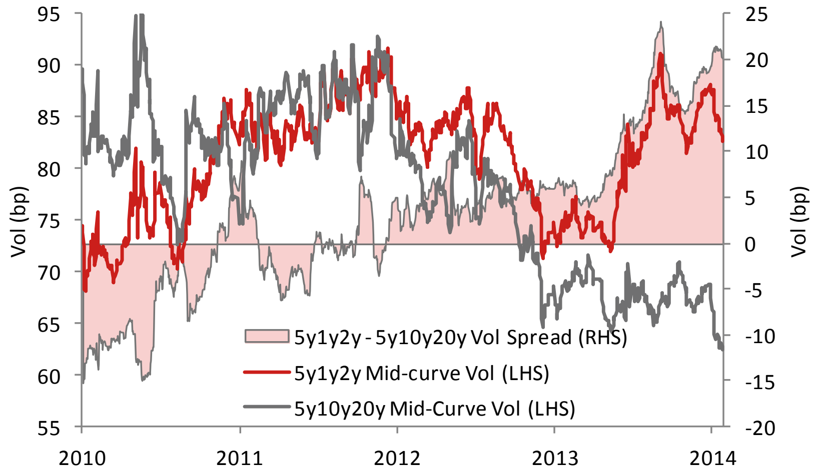
Finally, just running a back-test, we know (as one should expect) that for 96.2% of the past ten years of history the trade would have made money, for 2.85% of the time it would have expired worthless, and 0.95% of the time it would have lost money, if held to term.

Entry times and pricing rationale

We have a number of different reasons for putting on the trade at this time, but a major one is because of the significant vol differential priced into the upper left corner (1y2y vols) and the lower right corner (10y20y vols). This is partly due to the callable issuance which depresses lower left vols. Meanwhile, significant rate hike expectations have raised the premium at the lower right. We can see these two effects in Figure 5.

Fig. 5: ATM vol differential at a recent peak

Adding to the attraction of the trade

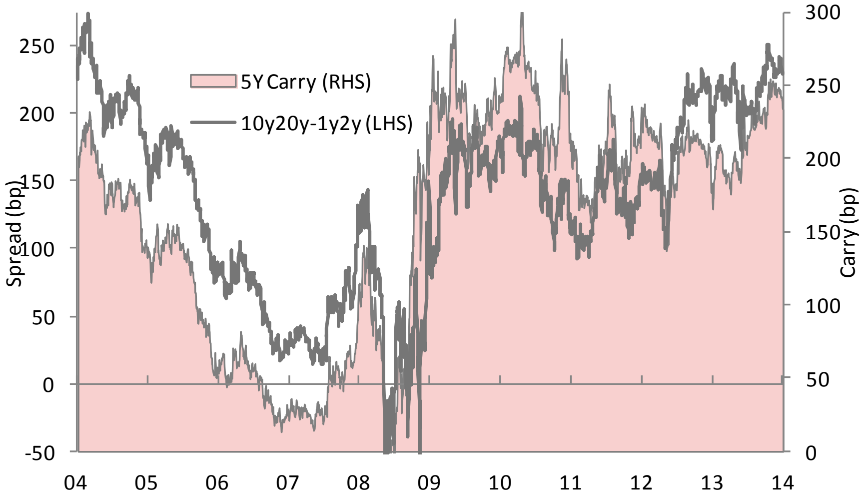


Source: Nomura Research

The carry built into the forwards is not as infrequent, and we can see in Figure 6 that it has often been this large, and the steeper the curve typically the higher the carry. Nonetheless, at 229bp we are not far off the recent peak (on 21 Nov 2013) of 254bp, which was a three-year high. The combined vol differential and the significant carry of the trade should both add to the attractions of this bear steepener, also giving us comfort that the current entry levels are likely to be among the best of the recent past.

Fig. 6: Levels and 5yr carry in bp

At 233bp, just off the 21 Nov 2013 peak of 254bp, which was a three-year record.



Source: Nomura Research

Carry and risks

As we have explained the trade can be carried to term and would likely expire in the money. Many investors may consider the trade for shorter than five-year horizons. In Figure 7 we show the package (at €10k/bp) with each leg priced. The roll (in rows below the Spot entry) shows that while both legs lose money (the long leg has positive carry but negative theta as we have explained) the package gains, with the biggest gains between years two and three. Given this analysis, we think the trade looks attractive on a three- to four-year horizon.

Fig. 7: PV and rolldown

Negative carry for the short leg and positive carry (but negative theta) for the long leg

Horizon	5y1y2y	5y10y20y	Package
Spot (PV)	**695,495**	**695,495**	**0**
1Y	-169,705	-38,274	131,431
2Y	-354,993	-56,381	298,612
3Y	-523,984	-86,829	437,155
4Y	-668,886	-142,064	526,822
5Y	-695,495	-168,722	526,773

Source: Nomura Research

Finally, we show the risks to the trade in Figure 8. As we see, the trade is short vega (since the short leg is ATMF while the long leg has lower vega being ITM) and similarly short gamma, each of which could affect the P&L if it is taken off before expiry.

Fig. 8: Risks to the trade

Modestly short vega and short gamma (from ATMF short leg, rather than the ITM long leg), are the largest Greeks

EUR Bear Steepener 5y1y2y vs 5y10y20y, €10k/bp Trade Risks								
Trade	Notional €	Spot %	Fwd %	Strike	Premium	Delta €/bp	Vega €/bp	Gamma €/bp2
Payer Midcurve 5y1y2y	-55MM	0.77	2.88	ATMF	-695,495	-3,482	-10,824	-20
Payer Midcurve 5y10y20y	9MM	3.06	2.84	ATMF-25	695,495	3,948	9,051	17
		2.29	-0.04	ATMF-25		467	-1773	-3

Source: Nomura Research

Trade Idea: Buy €9.3mn 5y10y20y ATMF-23bp (261bp) payers and sell €55.0mn 5y1y2y ATMF (77bp) payers for zero cost.

Appendix A-1

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