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Derivative Focus

CROSS-ASSET

Extreme carry with reasonable risk in CMS contingent floors

Searching over 3,000 trades for carry and protection

Global Markets Research

29 May 2014

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Quantitative Strategies

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Trade Ideas

1yr expiry, single-look USD CMS5 floor ATMF contingent on CMS30 higher than 3.25. Spot reference CMS5 1.57, CMS30 3.27. ATMF (non-convexity adj. 2.176) - 10.5cts offer (vs. 32cts for floor). Carry 1yr is 403%. 3-month carry rolldown: 27%, 40%, 46%, 190% (3m, not annualised).

1yr expiry, single-look EUR CMS10 floor ATMF contingent on CMS30 higher than 2.20. Spot reference CMS10 1.53, CMS30 2.22. ATMF (non-convexity adj. 1.791) - 6cts offer (vs. 22cts for floor). Carry 1yr is 338%. 3-month carry rolldown: 25%, 25%, 37%, 240% (3m, not annualised).

From CMS spread caps to contingent floors

In our recent reports Finding extreme carry in CMS spread caps and Extreme carry in EUR CMS spread caps, we searched over 7,500 of trades in order to maximise carry via CMS spread caps. Their attractiveness came from the relative steepness of yield curves, cheap vols and the rapidly declining CMS spread forwards. In this report, we search for trades in a similar vein, but this time looking at CMS contingent floors – where we buy a floor on the shorter CMS rate, conditional on the longer CMS rate being higher than a certain level.

The rationale is straightforward: in our previous reports we found substantial carry in CMS spread steepener trades. In the meantime, we have seen a large rally in long rates. Now, we try to put the two together, by exploring whether steepening trades, contingent on the actual level of rates, result in even higher carry positions. That is, if before we were proposing, for instance, a 1-year expiry USD 5s30s CMS spread cap (single-look), which would pay off if the actual slope turns out higher than the forwards, now we look at a floor on the 5yr CMS rate, contingent on the 30yr being higher than a certain level. For this structure to pay off, we need the 5yr rate to go below the floor strike, but the 30yr rate to be higher than the strike on what is effectively a digital option. So we are implicitly putting a trade on the 5s30s CMS spread, but now the pay-off and carry are dependent on the actual level of rates.

The upside for this type of structure is that the carry can be extremely large. In Figure 1 we show the results from optimising over 1yr contingent floors for USD and EUR, where the strikes on the floor and the digital are chosen so that the 1yr carry is highest. We can see that the 1yr carry and the carry rolldown on most structures is highly promising.

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

Fig. 1: Contingent floor trades (1yr expiry, single-look) with highest 1yr carry – as of 27 May 2014

						Carry Roll (3m, non-annualised)				Spot		1y Fwd (unadj)	
Currency	Rate 1	Floor strike	Rate2	Digital Strike	Carry 1y	0->3m	3m->6m	6m->9m	9m->Expiry	Rate1	Rate2	Rate1	Rate2
USD	CMS5	1.90	CMS30	3.35	1037%	21%	40%	53%	338%	1.64	3.35	2.26	3.51
USD	CMS2	0.65	CMS30	3.35	1723%	26%	49%	68%	473%	0.52	3.35	1.23	3.51
USD	CMS10	2.80	CMS30	3.35	1346%	12%	36%	36%	602%	2.63	3.35	3.02	3.51
USD	CMS2	0.65	CMS10	2.60	2164%	40%	53%	84%	472%	0.52	2.63	1.23	3.02
USD	CMS5	1.80	CMS10	2.60	2069%	26%	61%	74%	514%	1.64	2.63	2.26	3.02
EUR	CMS5	1.00	CMS30	2.25	404%	19%	21%	25%	180%	0.76	2.28	1.06	2.37
EUR	CMS2	0.65	CMS30	2.25	172%	16%	13%	11%	87%	0.36	2.28	0.50	2.37
EUR	CMS10	1.75	CMS30	2.25	673%	21%	19%	36%	292%	1.58	2.28	1.84	2.37
EUR	CMS2	0.60	CMS10	1.55	164%	14%	11%	8%	92%	0.36	1.58	0.50	1.84
EUR	CMS5	0.90	CMS10	1.55	527%	18%	14%	23%	276%	0.76	1.58	1.06	1.84

Source: Nomura Research

The reason for the large carry is simple: by adding a digital feature, the premium to be paid for the (contingent) floor is much smaller than that for a conventional floor, while the potential pay-off is the same. For comparison, in Figure 2 we show the details for the conventional 1yr CMS floors, with the same strikes. In the far right column, we can see how the premium on the conventional floor is typically many times over the premium of the contingent floor, hence the attainable carry is much lower.

Fig. 2: CMS floor trades (1yr expiry, single-look) – as of 27 May 2014

				Carry Roll (3m, non-annualised)				
Currency	Rate 1	Floor strike	Carry 1y	0->3m	3m->6m	6m->9m	9m->Expiry	PV Floor/PV Ctg Floor
USD	CMS5	1.90	69%	5%	8%	14%	32%	6.7x
USD	CMS2	0.65	298%	17%	20%	41%	101%	4.6x
USD	CMS10	2.80	-10%	-3%	-4%	-6%	2%	16.1x
USD	CMS2	0.65	298%	17%	20%	41%	101%	5.7x
USD	CMS5	1.80	32%	2%	3%	7%	18%	16.4x
EUR	CMS5	1.00	43%	8%	9%	10%	11%	3.5x
EUR	CMS2	0.65	21%	8%	8%	6%	-2%	2.2x
EUR	CMS10	1.75	0%	-1%	0%	0%	2%	7.7x
EUR	CMS2	0.60	18%	8%	7%	5%	-3%	2.2x
EUR	CMS5	0.90	15%	5%	5%	5%	-1%	5.4x

Source: Nomura Research

The higher carry of the contingent floor – relative to a conventional floor or a CMS spread cap – comes at a higher risk. With a contingent floor, we can have a zero pay-off if:

1) the CMS curve steepens but the shorter rate sells off; or
2) the curve steepens in a rally, but the long rate falls below the strike of the digital.

In this context, we need to weight the possibility of achieving a large carry against whether the strikes of the floor and the digital are deemed to be “reasonable” – ie, whether the breakevens are attractive. We will show that this is generally the case in our opinion. While the “super-high” carry may need strikes that are “uncomfortable”, a very large carry can be achieved at strikes that offer considerable protection against adverse moves.

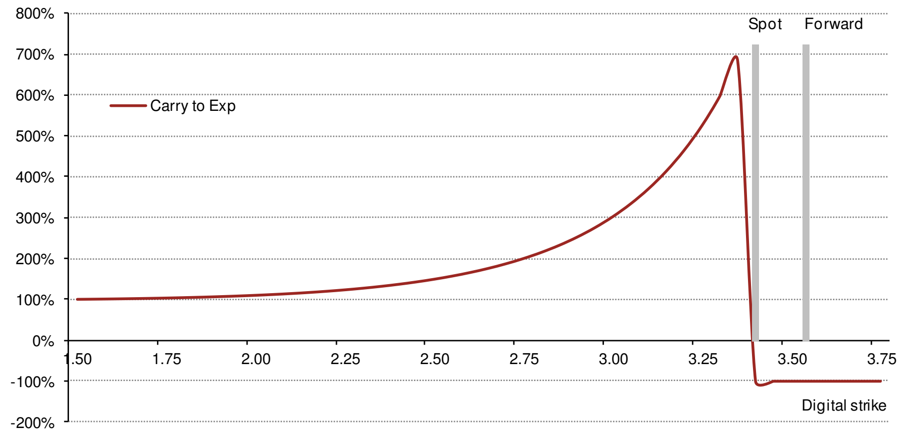
The search for pure carry

The first question is how to search for optimal trades, as for each pair of rates under consideration we now have three degrees of freedom to set up the trade: ie, the expiry, the strike of the floor on the short rate and the strike of the digital for the long rate. We have performed this exercise for EUR and USD CMS rates, confirming the equivalent spreads we considered in our previous reports: 5s30s, 2s30s, 10s30s, 2s10s and 5s10s. The interest on contingent options is mostly on short-dated expiries and for convenience of exposition we focus on the 1-year expiries. Hence, we maximise the 1-year carry (or carry to expiry, based on the option’s intrinsic value) and also present the 3m carry roll – that is we compute the carry at 3-month intervals until expiry. All in all, we search over 3000 trades. As already mentioned, some (striking) highlights of the results have already been presented in Figure 1.

It appears from our search, that the highest carry appears when one chooses the strike of the digital on the longer rate to be just below the current spot. This is the case regardless of the strike on the floor for the shorter rate. That could be expected: the more we restrict the space of positive pay-offs from the floor (by raising the strike of the digital), the cheaper the contingent floor for the same potential pay-off. The limit is the current spot of the long rate, as once the digital strike is higher than the spot, the carry is -100%. As usual, we are taking a “no-view” stance.

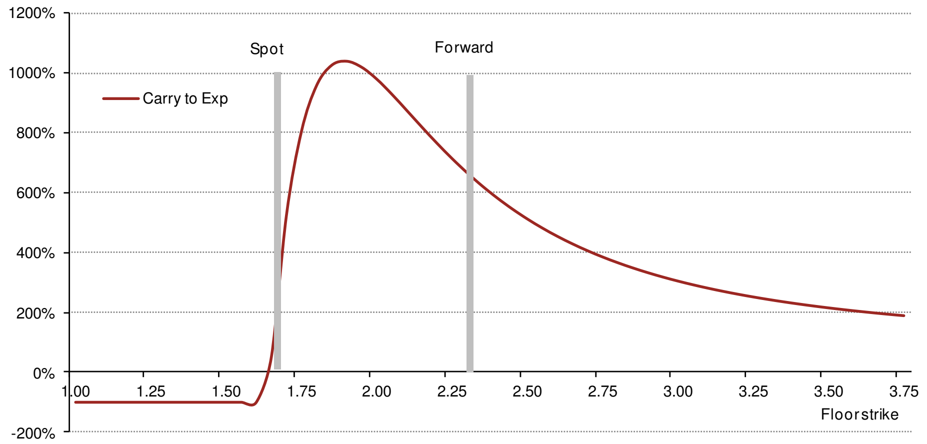
Therefore we run a two-step optimisation, where we first double-check that the digital strike is indeed optimal, then we optimise over the strike of the floor. The optimal strike of the floor is above the spot – obviously as carry to expiry is basically the intrinsic value minus the premium – but typically is slightly below the forward. In Figure 3 we show the results for the optimisation on the USD CMS5 floored contingent on the USD CMS30 being higher than a certain rate.

Fig. 3: Carry on 1yr USD CMS5 1.90 floor as a function of the strike on a CMS30 digital (single-look) – 27 May 2014



Source: Nomura Research

Fig. 4: Carry on 1yr USD CMS5 floor as a function of the strike, conditional on a CMS30 digital at 3.35 (single-look) – 27 May 2014



Source: Nomura Research

Taming the results – getting more attractive breakevens

The 1yr carry we can obtain from adding the contingent feature to a floor can be quite extreme. For instance, for the USD CMS2 floor, contingent on the CMS10, we can achieve, in principle, a carry above 2000% (or getting 20x the premium). Of course, high returns come at a risk – that is the basic tenet of modern finance. Stated otherwise, continuing with that example, it is not likely that the 2yr rate will remain low while at the same time the 10yr rate will move higher. However, all is not lost, in our view – the carry profiles that we can see in Figures 3 and 4, for instance, point to a solution: we have quite a significant margin to move the strikes so that the probability of achieving a positive pay-off is higher.

As an illustration, take the analysis for the USD CMS5 floor contingent on CMS30. There, we found that the highest carry was for a 1.90 strike on the CMS5 floor and a 3.35 strike on the CMS30 digital. From Figure 4, we can see how by striking the floor ATMF (2.28) we increase the floor breakeven from 1.88 to 2.20. If so, the 5yr could sell off by 56bp before we started to lose money on the trade, which is more than double the 24bp maximum adverse move than if we struck the floor at the original 1.90 level. Of course, the 1yr carry will come down from 1037% to about 682%, but that is still a very high value. What is also important is that the carry rolldown does not deteriorate much: at the new strike, it is 28%, 40%, 45%, and 201% (compared with the 21%, 40%, 53%, 338% at the original strike).

By looking at historical data for the last 20 years, it turns out that the probability of an original contingent option ending up with positive value (ie, at least we recover the premium) is about 10% – the probability of the 5yr selling off by less than 24bp over the next year, with the 30yr selling off over the same time (recall that we have struck the digital basically at the current spot level). If we instead change the floor strike to the ATMF, the probability of at least recovering the premium goes to 17%, as now the 5yr can sell off by 56bp. Recall, we need the 30yr rate not to rally at the same time.

Therefore, in order to decrease the risk of the contingent floor, we recommend increasing the strike on the floor to the ATMF, which increases the breakeven of the trade, while reducing carry not too harshly. In Figure 5 we present the comparison of carry and breakevens for the “extreme carry” and the ATMF strikes.

Fig. 5: Contingent floors: comparing the carry and breakevens for floor struck at “max carry” level vs. ATMF – as of 27 May

					Max Carry - "Extreme case"			Floor ATMF - "Higher protection"					
Currency	Rate 1	Floor strike	Rate2	Digital Strike	Carry 1y	Breakeven Rate1	Move From Spot	Floor ATMF	Breakeven Rate 1 ATMF	Move From Spot	Carry 1y	Carry ATMF/Max Carry	BE ATMF/ BEMax Carry
USD	CMS5	1.90	CMS30	3.35	1037%	1.88	23.7	2.28	2.20	56	682%	0.66	2.4x
USD	CMS2	0.65	CMS30	3.35	1723%	0.64	12.7	1.24	1.14	62	597%	0.35	4.9x
USD	CMS10	2.80	CMS30	3.35	1346%	2.79	16.1	3.05	3.01	38	944%	0.70	2.4x
USD	CMS2	0.65	CMS10	2.60	2164%	0.64	12.9	1.24	1.13	61	537%	0.25	4.7x
USD	CMS5	1.80	CMS10	2.60	2069%	1.79	15.3	2.28	2.20	56	701%	0.34	3.7x
EUR	CMS5	1.00	CMS30	2.25	404%	0.95	19.0	1.07	1.01	25	390%	0.96	1.3x
EUR	CMS2	0.65	CMS30	2.25	172%	0.54	18.2	0.50	0.45	9	153%	0.89	0.5x
EUR	CMS10	1.75	CMS30	2.25	673%	1.73	14.8	1.86	1.82	24	617%	0.92	1.6x
EUR	CMS2	0.60	CMS10	1.55	164%	0.51	14.8	0.50	0.45	9	157%	0.96	0.6x
EUR	CMS5	0.90	CMS10	1.55	527%	0.88	11.5	1.07	1.01	25	435%	0.83	2.2x

Source: Nomura Research

Trade recommendations

From the combined results in Figure 1, 2 and 5, we pick up the trades which we think offer the highest potential in terms of carry and a more attractive risk profile. In EUR, we think the choice is relatively clear, that is the CMS10 floor conditional on the CMS30. It has the highest 1yr carry, and that survives after moving the floor strike to the ATMF level. By doing that, the carry decreased by just about 8% but the breakeven change in the 10yr is 60% higher.

In USD, the choice is less straightforward. A priori candidates, the CMS2 or 5s contingent on CMS10s, see their extreme 1yr carry decline when choosing a more conservative strike for the floor. The same is the case for the CMS2 floor contingent on CMS30. A very serious candidate is the CMS10 floor contingent on the CMS30.

From our previous work on CMS spread caps, and given the strong recent flattening in 5s30s, we recommend the CMS5 floor, contingent on the CMS30. The carry when striking the floor ATMF is among the highest for all the USD trades and the breakeven move on the 5yr is substantial – about 56bp.

Of course, other combinations are possible, and the consistency of the carry rolldown points to the fact that shorter expiries (ie, less than 1yr) can also offer very high or extreme carry. It is important to note also that, while the market has experienced some large moves in the past few days, the results are quite robust (attainable carry, breakevens, optimal strikes vs ATMF). For the trade ideas below, we show the latest available levels, and the carry has been computed using the offer price.

Trade Ideas

1yr expiry, single-look USD CMS5 floor ATMF contingent on CMS30 higher than 3.25. Spot reference CMS5 1.57, CMS30 3.27. ATMF (non-convexity adj. 2.176) – 10.5cts offer (vs. 32cts for floor). Carry 1yr is 403%. 3-month carry rolldown: 27%, 40%, 46%, 190% (3m, not annualised).

1yr expiry, single-look EUR CMS10 floor ATMF contingent on CMS30 higher than 2.20. Spot reference CMS10 1.53, CMS30 2.22. ATMF (non-convexity adj. 1.791) – 6cts offer (vs. 22cts for floor). Carry 1yr is 338%. 3-month carry rolldown: 25%, 25%, 37%, 240% (3m, not annualised).

All pricing and levels as of 29 May 2014.

Fig. 6: Trade ideas – description, carry and risk analysis – as of 29 May 2014

All figures In respective currencies

Trades - 100mm notional		Floor strike	Premium (offer)	Uncontingent floor premium (offer)	Carry 1y	Theta (per day)	Delta (per bp)	Vega (per bp)	Correl Risk (per %)
USD CMS 5 floor ATMF contingent on CMS30 >3.25	1y exp, SL	2.176	Usd 105k	Usd 320k	403%	-66	-669	679	-2004
EUR CMS 10 floor ATMF contingent on CMS30 >2.20	1y exp, SL	1.791	Eur 60k	Eur 220k	338%	-26	-228	339	-1817

Source: Nomura Research

Appendix A-1

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