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Derivative Focus

CROSS-ASSET

Finding extreme carry in CMS spread caps

Scanning 7,500 trades in EUR and USD CMS spread caps

Global Markets Research

7 March 2014

Research analysts

Quantitative Strategies

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Trade Ideas

1. **6m expiry 5y-30y USD SL cap spread at 1.70-2.00 for 13.25cts. (comparison: 6m expiry SL cap at 1.70 for 18 cts).**
2. **1y expiry 5y-30y SL cap spread at 1.70-1.95 6.75cts (comparison 1y SL cap at 1.70 for 17cts).**
3. **18m expiry 5y-30y SL cap at 1.80 for 7.25cts.**
4. **1y expiry 5y-10y USD SL cap at 1.00-1.15 for 5.75cts.**

Reference rates: Spot 1.99%, unadjusted forwards 6m: 1.728%, 1y: 1.468%, 18m: 0.921%

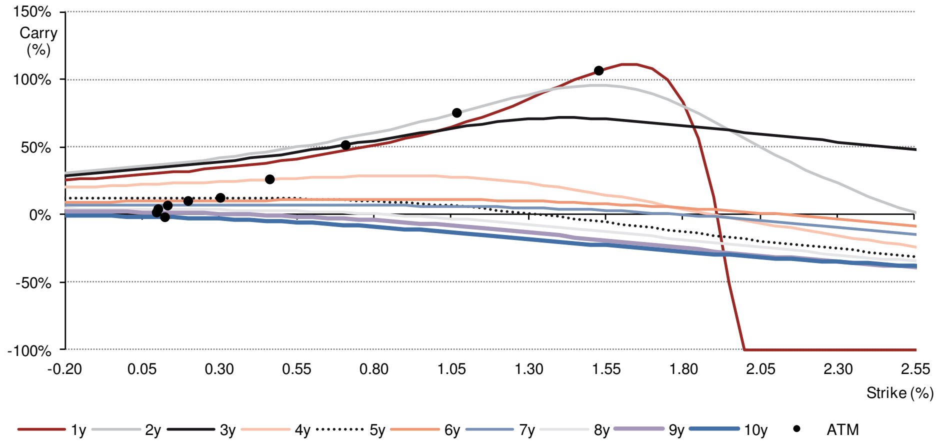
We recommend several CMS spread cap trades for their high carry (between 210% and 254% for carry over a 1y horizon and 69% to 121% for carry over a 6m horizon). To determine the best such trades we searched for peak carry candidates with numerous different dimensions:

- USD and EUR.
- 5 CMS spread combinations (5s30s, 2s30s, 10s30s, 2s10s, 5s10s).
- Semi-annual expiries to 3 years and annual thereafter until 10 years (a total of 13 expiries).
- 50 strikes (ranging from -20bp to 260bp).

From these we have identified several good trading ideas, and used these individual single-look caps in cap-spread (i.e., call spreads on CMS slope) combinations to further enhance their possible returns. We have explored over 7,500 different trades with CMS spread caps, with the aim of maximising carry.

Fig. 1: USD 5s30s CMS spread cap, single-look. 1-year carry (as % of premium) vs strike, for different option expiries

Short expiries offer highest carry



Source: Nomura Research

The basic trading ideas are derived from charts such as Figure 1, where we take the USD 5s30s spread cap (single-look) and plot the 1-year carry against the option strike for each expiry from 1y to 10y. For reference, we also show the 1y carry of the option struck ATMF. Notice how for short expiries, which struck somewhat higher than the ATMF, the carry obtained is fairly high – we could even suggest "turbo-carry". Our work is to make this exploration systematic, for different spreads in EUR and USD, and for different strategies.

An attractive environment for carry

The euro and US swap curves are very steep. This is an unsurprising consequence of highly accommodative monetary policies, as ultra-low intervention rates depress the front end, while QE tapering has put pressure on the longer end. In the meantime, implied vols remain extremely subdued, as the monetary authorities have expressed their aversion towards volatility and continue to supply the market with volatility through (tapering but substantial) MBS purchases and shorting sovereign CDS via the OMT. With recent economic releases less than stellar, carry trades are highly attractive.

In the search for carry we focus on CMS spread caps, though this may seem counterintuitive because of their steepening bias. But while benefitting from a steeper curve, the current environment affords us the possibility of striking trades, which give decent buffer to curve flattening, while making substantial returns if the curve stays unchanged.

Whether that will work depends on the pricing, which is a function of the forward curves, the rates volatilities (via the convexity adjustment inherent in forward CMS rates) and the volatility of the spread itself. **We argue that the current forwards/vols produce some attractive opportunities for carry trades via CMS spread caps, typically in a single-look format.** In this report, **after a relatively exhaustive search, we focus on USD 5s30s CMS spread caps, which have been attracting some interest recently.**

Where is the carry in CMS spread caps?

We studied USD and EUR CMS spread caps in a single-look format with expiries from 1y to 10y – although most of the liquidity is concentrated in expiries up to 3 years. **We consider the following slopes: 5s30s, 2s30s, 10s30s, 2s10s and 5s10s**. Other possibilities exist (eg 10s20s), but liquidity may be lower. We have computed the PV of the option and we then "aged" the trade by one year – effectively obtaining 1-year carry. We express that as a percentage of the original premium.

The results of this exploration can be found in Figure 2. The highest carry is obtained for USD 5s10s, with a 1-year expiry, at 138%. A close second is for USD 5s30s, with 111% in the 1-year expiry. Interestingly, the carry on the 5s30s spread is very high for the 2-year and 3-year expiry, while that of the 5s10s becomes less attractive for expiries longer than 2 years. We also note that for some other slopes, the carry becomes more attractive in the 2-year to 4-year expiries (eg USD 2s10s or 2s30s). We also note that carry is much more attractive in USD slopes rather than in euro – although the numbers for euro are far from negligible. For longer expiries, USD runs out of steam, while EUR cap spreads retain good carry in the 5y and longer-dated expiries. In this report we focus on the short-dated USD 5s30s and USD 5s10s, saving (the slightly less liquid) longer dates for future studies.

Fig. 2: Maximum achievable 1-year carry - per expiry

Optimising over strike (50 per expiry) - total of 5,000 trades considered.

Expiry	1y	2y	3y	4y	5y	6y	7y	8y	9y	10y
USD 5s30s	111%	95%	72%	28%	12%	11%	7%	4%	2%	0%
USD 2s30s	54%	87%	80%	55%	26%	20%	14%	13%	11%	7%
USD 10s30s	73%	53%	28%	17%	9%	6%	5%	12%	13%	13%
USD 2s10s	18%	53%	57%	43%	23%	10%	7%	11%	11%	10%
USD 5s10s	138%	68%	22%	12%	4%	6%	5%	3%	3%	2%
EUR 5s30s	37%	34%	37%	30%	33%	19%	26%	15%	14%	13%
EUR 2s30s	11%	28%	33%	35%	49%	32%	31%	18%	13%	6%
EUR 10s30s	42%	23%	19%	18%	28%	24%	35%	3%	8%	23%
EUR 2s10s	-4%	10%	17%	18%	23%	12%	9%	9%	7%	3%
EUR 5s10s	11%	14%	14%	12%	14%	19%	24%	13%	12%	7%

Source: Nomura Research

For USD 5s30s we present 1-year carry vs the strike for annual expiries up to 10 years in Figure 1 (see front page). As a reference, the spot spread is currently around 198bp. In addition, for each expiry we plot the 1-year carry of the option struck ATMF. For instance, for the 2-year expiry (light grey line), the ATMF is 107bp (31.25bp premium), giving a 1-year carry of 75% of the premium. Notice that by choosing a higher strike, we are able to obtain a higher carry – the highest is for a 150bp strike giving carry of 95% of the premium. Note **the global maximum for carry among all the expiries we consider, is the 1-year expiry struck at around 170bp (ATMF is 153bp), which gives a carry of 111% of the premium.** We present the results for the carry "sweet spots" in Figure 3.

The results in Figures 1 and 3 suggest expiries in the 1-year to 3-year range should be considered, **and** choosing a strike higher than the ATMF, as a means to maximise carry.

Fig. 3: USD 5s30s CMS spread cap – reference and 1y carry sweet spots per expiry

Shorter expiries, OTM caps offer higher carry

Expiry	1y	2y	3y	4y	5y	6y	7y	8y	9y	10y
ATM Strike	1.528	1.069	0.709	0.463	0.304	0.199	0.133	0.102	0.097	0.124
Carry (ATM)	106%	75%	51%	26%	12%	10%	7%	4%	2%	-2%
Highest 1y carry	**111%**	**95%**	**72%**	**28%**	**12%**	**11%**	**7%**	**4%**	**2%**	**0%**
Strike	**1.70**	**1.50**	**1.45**	**0.90**	**0.25**	**0.85**	**0.50**	**-0.20**	**-0.20**	**-0.20**

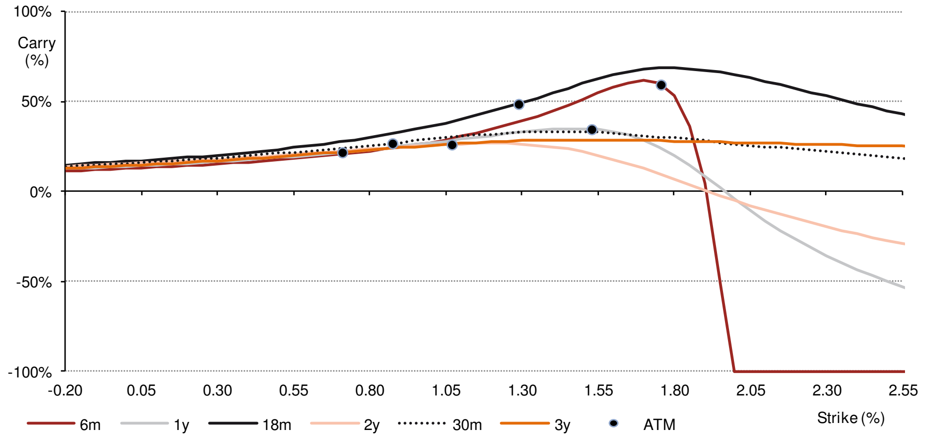
Source: Nomura Research

To be precise, for the 1-year expiry we compute 1-year carry by assuming the option rolls down to its intrinsic value – hence the carry for very high strikes being minus 100%.

In Figure 4 we look at 6-month carry (non-annualised), this time only for short expiries – from 6 months to 3 years, in steps of 6 months. We emphasise that we do not annualise carry, but just present it as a percentage of the option's premium.

Fig. 4: USD 5s30s CMS spread cap, single-look. 6-month carry (non-annualised, as % of premium) vs strike, for short expiries

The 18-month expiry stands out



Source: Nomura Research

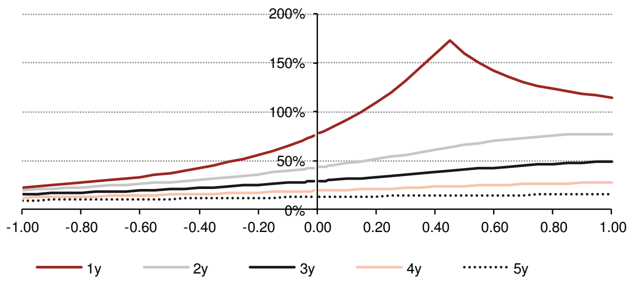
Note that **on a 6-month carry basis, the 18-month expiry stands out, offering a better carry than the rest of expiries** – the global maximum is 69% carry, for a 180bp strike (as a reference, the ATMF is around 128bp, giving a 49% carry).

Enhancing carry via spreads of CMS spread caps

Given the information displayed by the charts in the style of Figure 1 or 3, **it is important to ask whether we can improve the carry picture by changing the strikes, or via spreads of CMS spreads caps** (i.e., call spreads on the slope) – where we buy and sell a CMS spread cap with different strikes. Intuitively, we want to buy the option that carries positively and sell the one that carries worse.

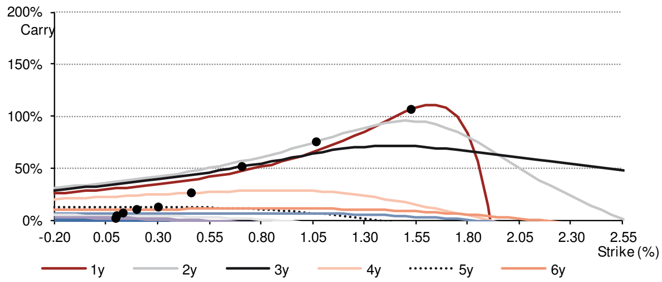
We have explored two ideas. **The first strategy is where we buy the cap struck ATMF and sell a cap struck at ATMF +/- a margin. Then, we optimise over the margin so that the carry of the whole package is maximised.** The results are shown in Figure 5 – where we present 1-year carry for the USD 5s30s case. For comparison, we show the carry achievable by just buying a cap, where we have scaled the x-axis in Figures 5 and 6 to be the same.

Fig. 5: 1-year carry from buying a USD 5s30s CMS spread cap (single-look) struck ATMF vs selling another cap struck ATMF +/- margin (margin in horizontal axis)



Source: Nomura Research

Fig. 6: For comparison: USD 5s30s CMS spread cap, single-look. 1-year carry (as % of premium) vs strike, for different option expiries



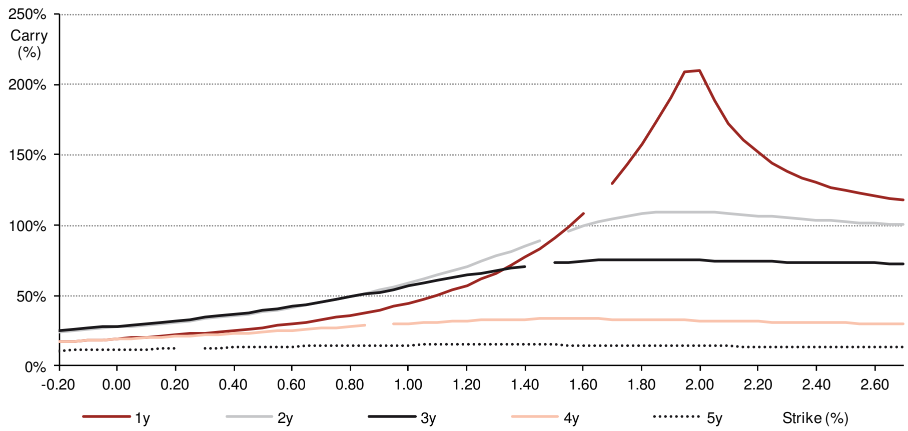
Source: Nomura Research

Note how the global maximum in carry is given by the combo with the 1-year expiry, resulting from buying the cap ATMF and selling a cap struck 45bp above (i.e., 1.53-1.98 strike cap spread), for 1-year carry in the 173% region. Of course, the carry profile flattens out for higher strikes, converging to the carry of the ATMF as the short cap becomes less pertinent.

The second is a more general strategy, which will produce even higher carry, will be one where we buy the cap struck at the level that produces the highest carry (for a given expiry), and then we optimise over the strike of the option we sell, so that we maximise the carry of the package. It is the case that this type of strategy generates an additional carry return. We can see the results for all strikes of the cap we sell in Figure 7, and then we present the carry "sweet spots" in Figure 8.

Fig. 7: 1-year carry from buying a USD 5s30s CMS spread cap (single-look) with highest carry strike vs selling another cap (with strike in horizontal axis)

Achieving the highest carry



Source: Nomura Research

The global maximum for 1-year carry is achieved, as expected, with the 1-year expiry option. We buy the cap struck at 1.70% (highest carry, see Figure 1 or 3), and sell the cap struck at 1.95% (recall that the ATMF is 1.53%) – the result is carry in the 210% region. The results from the whole optimisation are shown in Figure 8. We note the large increases in carry for the 2-year and 3-year expiries versus the previous strategy.

Fig. 8: Optimising the strikes for a USD 5s30s CMS spread cap combo to maximise carry

Expiry	1y	2y	3y	4y	5y
Buy Strike	1.70	1.50	1.45	0.90	0.25
Sell Strike	2.00	1.95	1.80	1.50	1.25
1y Carry	210%	109%	75%	33%	15%

Source: Nomura Research

We have also run this optimisation for all the spreads in our original search space (including euro) to make sure that the focus on USD 5s30s does not make us miss other opportunities. The results are in Figure 9.

Fig. 9: Maximum 1-year carry achievable with spreads of CMS spread caps (single-look), where we buy the cap with highest carry and sell another where we optimise over its strike

Expiry	1y	2y	3y	4y	5y
USD 5s30s	210%	109%	75%	33%	15%
USD 2s30s	65%	95%	85%	61%	30%
USD 10s30s	142%	65%	34%	20%	12%
USD 2s10s	54%	68%	74%	52%	28%
USD 5s10s	254%	89%	32%	17%	12%
EUR 5s30s	90%	44%	43%	35%	37%
EUR 2s30s	47%	37%	41%	41%	53%
EUR 10s30s	96%	35%	25%	20%	30%
EUR 2s10s	10%	16%	23%	21%	26%
EUR 5s10s	54%	23%	18%	15%	16%

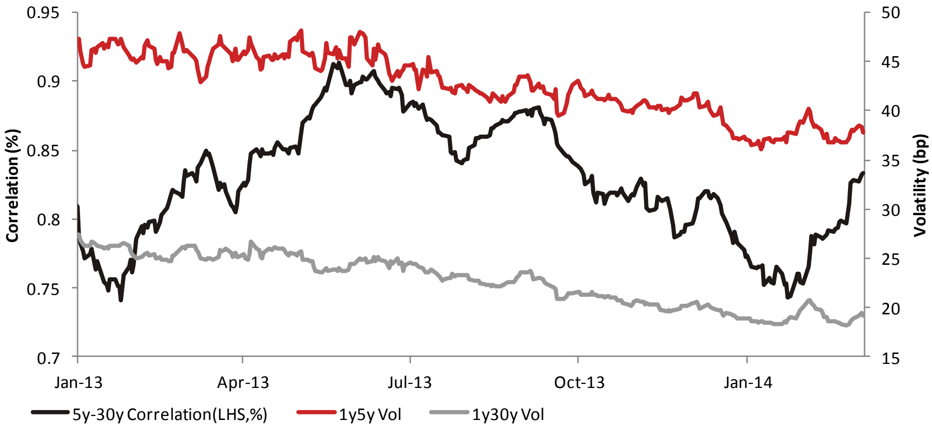
Source: Nomura Research

We also note that the USD 5s10s package stands out as having the highest carry at over 250%, with the 5s30s coming second – but showing a more uniform decline when we consider longer expiries – 1y carry is as high at 75% for the 3-year expiry. In general, USD offers the most value for short expiries, although we note that euro 5s30s and 10s30s have a carry over 90%.

The outlook for the 5s30s slope and CMS spread options

For the 5y-30y spread options, pricing is at attractive levels currently, particularly because of rising correlation, which recently coincided with the continuing downtrend in vols. This can be seen in Figure 10, where we plot the 1y5y and 1y30y volatilities together with the 100-day rolling 5y-30y Kendall correlation. Note, the increasing correlation is beneficial as all the trades are short correlation – more on this in the risks section below.

Fig. 10: 5s30s correlation vs 1y5y and 1y30y vols
Confluence of moves leading to cheaper pricing



Source: Nomura Research

While 5y-30y spread option caps benefit from overall steepening, we note that spreads are generally far less volatile than the exceptionally steep 2y-10y slope, and as a consequence, the trades will probably withstand flattening pressure better than any other.

Risks – long vega, short correlation

We have evaluated the risks (delta, vega, correlation and theta) for the trades we have selected as more attractive and their references – see Figure 11.

Fig. 11: Trades and risks
Spread caps much less risky than outright SL caps

Trades - $100mm notional per leg		Strike	Unadj. Fwds	Premium ($)	Horizon	Carry	Theta ($/day)	Delta ($/bp)	Vega ($/bp)	Correl Risk ($/%)
USD 5s30s	6m CMS Spr Cap Spr SL	1.70-2.00	172.8	135k	6m	125%	-124	-169	738	-751
USD 5s30s	6m CMS Spr Cap SL	1.7	172.8	185k	6m	63%	-411	-267	2,297	-3,338
USD 5s30s	1y CMS Spr Cap Spr L	1.70-1.95	146.8	85k	1y	210%	-92	-257	982	-1,369
USD 5s30s	1y CMS Spr Cap SL	1.7	146.8	145k	1y	111%	-292	-454	3,010	-4,947
USD 5s30s	18m CMS Spr Cap SL	1.8	120.5	70k	6m	69%	-142	-392	2,141	-4,885
USD 5s10s	1y CMS Spr Cap Spr SL	1.00-1.15	92.1	57.5k	1y	254%	-51	-181	471	-3,812

Source: Nomura Research

All the trades are long vega and short correlation risk, with modest negative delta. The most interesting thing, in our view, is that the spread trades have a much lower risk, while they offer a much higher carry. For instance, the USD5s10s spread cap spread at 1.00-1.15 reported in the table has vega of $471/bp and correlation risk of -3,812$/%, for carry of 254% over 1y. The USD 5s10s 1y cap, struck ATMF would have vega of $1,438/bp and correlation risk of -13,038$/% – roughly three times the risk – for carry of 138% – roughly half the carry.

Trade Ideas

6m expiry 5y-30y USD SL cap spread at 1.70-2.00 for 13.25cts
(comparison: 6m expiry SL cap at 1.70 for 18 cts).
1y expiry 5y-30y SL cap spread at 1.70-1.95 6.75cts (comparison 1y SL cap at 1.70 for 17cts).
18m expiry 5y-30y SL cap at 1.80 for 7.25cts.
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Reference rates: Spot 1.99%, unadjusted forwards 6m: 1.728%, 1y: 1.468%, 18m: 0.921%.

Appendix A-1

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