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Fixed Income Research
http://www.credit-suisse.com/researchandanalytics

Gilt Future Calendar Spread Analysis

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The View:

- UKT 5% 25 is rich on the curve. We, therefore, **recommend buying the G H2-G M2 roll**.
- The roll implied net basis for UKT 5% 25 is around 25 cents. A model-based fair value for the optionality is around 29 cents. Based on our market views, we think the fair value for the optionality ought to be a lot less, perhaps 6-8 cents. **We would, therefore, be sellers of UKT 5% 25 versus G M2 at an implied net basis of 25 cents or higher. As a gilt RV trade, we favor being long 22s and 30s (or 27s) versus 25s or G M2.**

The Rationale:

- UKT 4% 22 is CTD to the H2 contract and UKT 5% 25 is CTD to the M2 contract. **Therefore, the gilt roll will largely be driven by the 22-25 gilt switch.** We do not have strong views on the overall 10s30s curve at current levels, but we do think 25s are rich on the curve. Hence, our recommendation for shorts to roll early.
- There is significant optionality in the M2 contract. A parallel-shift rally of 20bp would cause all three bonds (21s, 22s, 25s) in the basket to be very close to CTD status. A simple calculation based on implied swaption vol suggests that the fair value for the optionality ought to be 28 cents.
- Given the low level of yields and perhaps the view that QE is nearing the end, we think that a gilt rally would be limited, perhaps 20-30bp at most. We also think that bull flattening is not too likely between 22s and 25s, especially with the threat of a ratings downgrade looming. Taking these views into account, a fair value of the net basis ought to be around 6-8 cents.
- Positioning is always critical in determining how rolls will trade. However, it is hard to draw strong conclusions regarding positioning in this quarter. Therefore, our recommendations are based on RV considerations and not on positioning.
- Both 22s and 25s are eligible for BOE's QE. BOE Holdings are comfortably below the 70% threshold for both, so QE is not likely to distort the market. We also think that the upcoming tap of 22s on 1 March is unlikely to cheapen 22s much from here. **Also note that any new 10y bond (e.g. Sep-22) would not likely be CTD due to the likely low coupon.**
- The roll will be very dynamic due to the different dv01 between the two contracts and the dependence on curve. For a live update on the fair value and rest of the levels mentioned here, we recommend that clients use Locus.

Exhibit 1: G H2-G M2 Roll Summary (ref G H2 116.1, 4 22/5 25 +32bp)

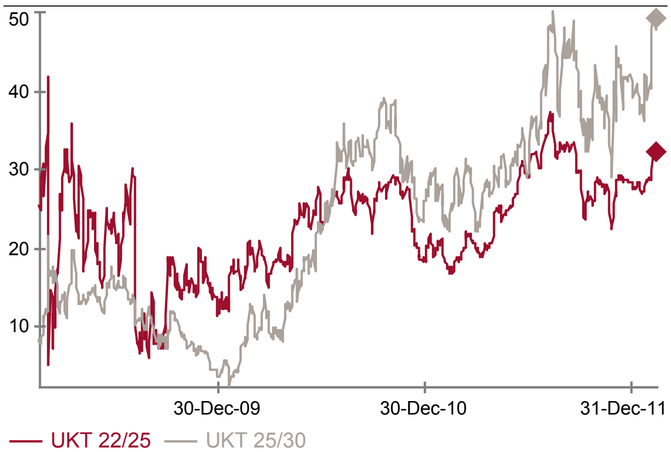
Estimated Fair Value	Hedge Ratio	Recommendation
137 cents	1000:840	Shorts roll early

Source: Credit Suisse

UKT 5% 25 is rich on the curve

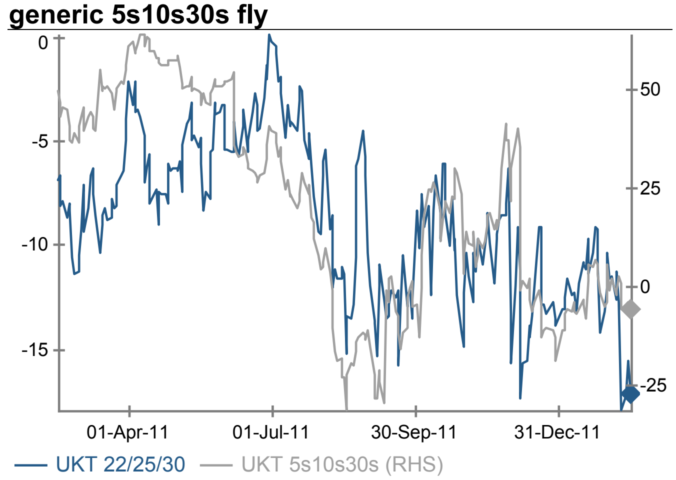
Exhibit 2 shows that 22/25 is too flat relative to 25/30. This is essentially the main reason we suggest buying the roll, as the risks in the 22/25 switch are towards steepening. Exhibit 3 shows that the 22/25/30 fly is too low relative to a generic 5s10s30s fly. The risk to buying the gilt roll (or to the 22/25/30 fly) is further richening of 25s due to perhaps a bull flattening move of the curve or due to 25s further richening in relative value terms. **Note that 25s would likely be CTD for a few more contracts, potentially for as many as 4.75 years to come.** The question that then logically arises is how much the CTD status is worth. We think that unlike Bunds, for example, where repo does tend to get special into delivery and, hence, CTD status is worth something, gilt CTD status does not carry a premium currently. We think the market is unlikely to price a CTD premium in the 25s currently. Consequently, we are comfortable with the recommendation to buy the roll.

Exhibit 2: UKT 22/25 is too flat relative to 25/30



Source: Credit Suisse Locus

Exhibit 3: UKT 22/25/30 fly is too low relative to generic 5s10s30s fly



Source: Credit Suisse

Optionality analysis

Optionality analysis is by far the most interesting aspect of this gilt basis/roll; therefore, we think it makes sense to spend time analyzing it. The scenario profile in Exhibit 8 shows the theoretical net basis (and, therefore, which bond is CTD) for parallel yield shifts in the M2 basket. Let us first explain what we mean by fair value for the optionality (net basis). The net basis of a bond within the basket is defined as the difference between the forward price of the bond and the futures price (adjusted by the conversion factor). Assuming a rational investor that always delivers the cheapest bond into the contract (hence, the term cheapest to deliver) the basis at expiry can either be zero (for the CTD) or positive (for non CTD bonds). **The optionality (theoretical net basis of the CTD) is defined as the expected basis at expiry.** Let us give a very simple example. Let's assume a futures contract with two deliverable bonds and let's assume three distinct outcomes for the two bonds (Exhibit 4). What is then the theoretical net basis (optionality)? It is the expected basis of bond A at expiry: 50% x 0 + 25% x 0 + 25% x 20 = 5 cents. The calculation in the above example was simple, but in practice the outcome is not discrete and it is far more challenging to come up with a fair value for the optionality.

Exhibit 4: Net basis for the two bonds under the three scenarios

Probability for scenario I, II, III is 50%, 25%, 25%

	Scenario I	Scenario II	Scenario III
Bond A	0	0	20
Bond B	20	50	0

Source: Credit Suisse

Essentially, the value of the optionality depends on the following:

- Volatility of outright yields.
- Curve volatility, as well as correlation with yields.
- Micro switch volatility (essentially how out of line bonds can get on an RV basis).
- Repo volatility (likelihood of bonds going special in repo).

It, therefore, becomes obvious that the optionality is then equal to a multidimensional integral of a probability density function, which is pretty arbitrary and hard to compute. It is, hence, far from straightforward, when non-zero optionality exists. Quant models exist whereby the yield curve is modeled as a stochastic process with certain characteristics (normally calibrated on past behaviour). These models calculate the optionality of the contract. There are two types of errors that market participants could make:

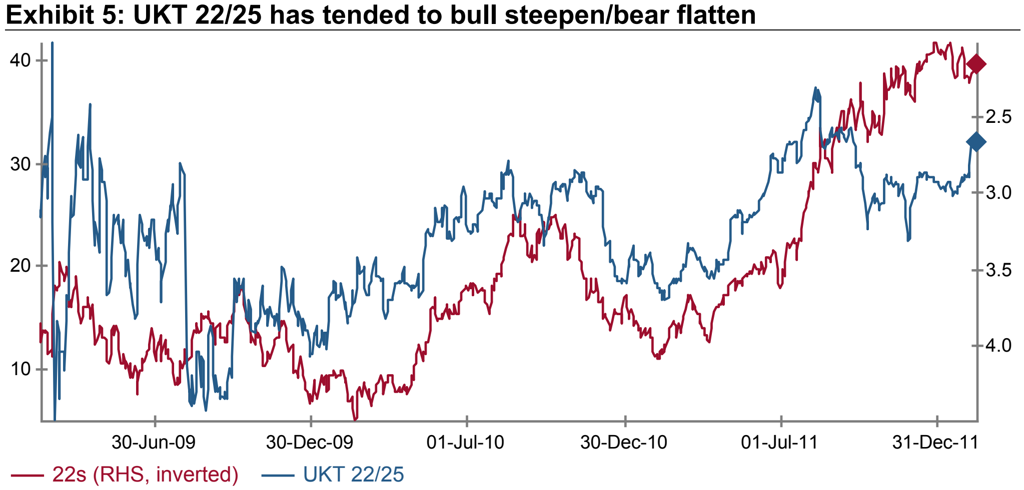
- The optionality is ignored altogether.
- The optionality is calculated based on past data. But sometimes the past is not a good guide for the future.

You can see how our internal model values the optionality in Locus (under listed derivatives/calculators/basis roll model). But as we explained, it makes sense to try and verify it manually.

G M2 optionality

We now examine the G M2 optionality. We calculate the optionality in two ways. Firstly, by a simple approximation where no market view is taken into account. Secondly, we take our view into account.

Exhibit 5: UKT 22/25 has tended to bull steepen/bear flatten



Source: Credit Suisse Locus

3m10y swaption vol is currently around 88bp. Assuming gilts move by the same amount as swaptions and given that there are four and a half months to expiry for G M2, a one sigma move in 10y gilts would be around 50bp. Exhibit 5 shows how 22-25 has behaved relative to outright yields. The 22-25 curve has tended to bull steepen/bear flatten, but more recently the curve has not had a strong relationship with yields. Given that 3m10y and 3m15y vols are roughly equal, let us assume in our simple scenario that the curve moves in parallel. Let us also ignore skew for the time being (GBP 3m10y swaptions have a higher payer skew relative to receivers, but the difference is not big). Let us approximate the curve movements as three distinct outcomes. A 50bp rally, unchanged yields and a 50bp sell-off, and let us assign equal probabilities for each. **In that case, the fair value for the optionality is around 29 cents (33% x 88 cents), see Exhibit 6.**

Exhibit 6: Simple optionality calculation (no market views)

Under these assumptions the optionality is around 29 cents.

Scenario	50bp rally	unch	50bp sell-off
Probability	33%	33%	33%
25s NB	88	0	0
22s NB	0	30.5	127

Source: Credit Suisse

Now let us make some assumptions and re-compute the optionality:

- Gilts are unlikely to rally much (QE2 is priced in and no more to come for now, yields are very low and the threat of downgrade is looming – all of which make a big gilt rally not too likely), so we replace the 50bp rally scenario with a 25bp rally.
- We assume a little bit of steepening in a rally and a bit of flattening in a sell-off. We think that the threat of downgrade makes the bull flattening scenario not very likely, in our view. Moreover, given that the QE is now concentrated in the belly of the curve, it makes bull steepening more likely.

Exhibit 7 shows the modified table of outcomes based on our assumptions. The fair value for the optionality now becomes 2.5 cents. If we allow for a small probability of a tail risk then the fair value of the optionality becomes, say, 6-8 cents.

Exhibit 7: Simple optionality calculation (making market assumptions)

Under these assumptions the optionality is around 2.5 cents.

Scenario	25bp rally, 1bp steepening	unch	50bp sell-off, 1bp flattening
Probability	50%	25%	25%
25s NB	5	0	0
22s NB	0	30.5	115

Source: Credit Suisse

Taking our views into account we would recommend selling 25s net basis at 25 cents or higher (we think 25 cents makes it compelling enough to enter into a trade, while a lower level does not provide a very compelling risk/reward). The risk to that trade would be a gilt rally accompanied with a richening of 25s on the curve. This trade ought to be more appealing for gilt RV traders.

Exhibit 8: G H2, M2 basket analysis. Decent optionality in the M2 basket

UKT 4 22 is CTD to H2 contract and UKT 5 25 is CTD to M2 contract.

Futures Basis Roll Model

Clear Overrides | Historical Report | Add Synthetic Bond | Repo Admin

Value Date 15-Feb-12 | Contract GBP FLGH2
Delivery Date 30-Mar-12 | Pricing Live Mid

Futures Contract: FLGH2

	Decimal						
Futures Price	**116.1000**	**DV01**	9.82086	**First Delivery Date**	01-Mar-2012	**Default Repo Rate**	EMD GC GBP
Futures TheoPrice	116.1049	**Gamma**	0.0000	**Last Delivery Date**	30-Mar-2012	**Override Repo Rate**	**0.430%**
Rich/Cheap	-0.00486	**Weighted Yield**	2.162%				

Calculate | Refresh

Description	Spot Price	Basis	Spread to CTD	Spot Yld	Conv Factor	Repo Rate	Carry (32nds)	Net Basis	Theo Net Basis	Actual IRR	Theo IRR	Fwd DV01/CF	Delivery Prob	CTD Spread	MMY	MMY DV01
UKT 3.750 09/07/2021	114.384	0.562	-0.081%	2.082%	0.9804	0.430%	2.106%	0.181	0.176	-0.896%	-0.861	9.370	1.8%	1.9	2.126%	9.169
UKT 4.000 03/07/2022	116.516	0.415	0.000%	2.163%	1.0000	0.430%	2.188%	0.006	0.001	0.395%	0.431%	9.692	98.2%	0.0	2.188%	9.691

Futures Contract: FLGM2 | Futures Spread **1.3950** | Futures Theo Spread 1.372 | Hedge Ratio 1000:881

	Decimal						
Futures Price	114.7050	**DV01**	11.1526	**First Delivery Date**	01-Jun-2012	**Default Repo Rate**	EMD GC GBP
Futures TheoPrice	114.7332	**Gamma**	0.0000	**Last Delivery Date**	29-Jun-2012	**Override Repo Rate**	**0.430%**
Rich/Cheap	-0.02822	**Weighted Yield**	2.388%				

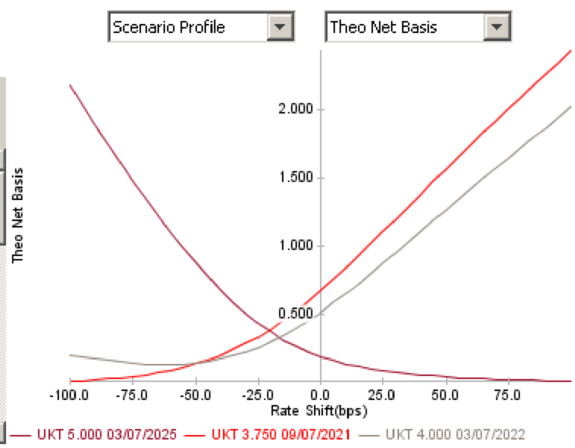
Description	Spot Price	Basis	Spread to CTD	Spot Yld	Conv Factor	Repo Rate	Carry (32nds)	Net Basis	Theo Net Basis	Actual IRR	Theo IRR	Fwd DV01/CF	Delivery Prob	CTD Spread	MMY	MMY DV01
UKT 3.750 09/07/2021	114.384	1.886	-0.401%	2.082%	0.9808	0.430%	2.159%	0.702	0.674	-1.235%	-1.169	9.085	9.7%	5.4	2.238%	8.846
UKT 4.000 03/07/2022	116.516	1.817	-0.320%	2.163%	1.0000	0.430%	2.241%	0.544	0.516	-0.836%	-0.770	9.411	17.6%	3.5	2.299%	9.358
UKT 5.000 03/07/2025	127.918	1.840	0.000%	2.483%	1.0992	0.430%	2.559%	0.221	0.190	-0.034%	0.032%	11.284	72.7%	0.0	2.577%	12.377

*Highlighted rows are displayed in the graph. Double click on a bond to add it to the graph. Delete the contents in green cells to clear overrides.

Rate Scenario ☐ FLGH2 ☑ FLGM2

Type Parallel | Min 100 | Max 100 | Step 5

Rate Shift (bps)	CTD	Futures Price	Futures DV01	Theo Net Basis CTD	CTD Fwd DV01/CF
-100	UKT 3.750 09/07/2021	125.390	10.534	0.011	9.997
-95	UKT 3.750 09/07/2021	124.864	10.508	0.015	9.949
-90	UKT 3.750 09/07/2021	124.339	10.487	0.021	9.901
-85	UKT 3.750 09/07/2021	123.815	10.470	0.028	9.854
-80	UKT 3.750 09/07/2021	123.292	10.460	0.036	9.807
-75	UKT 3.750 09/07/2021	122.769	10.455	0.047	9.760
-70	UKT 3.750 09/07/2021	122.246	10.456	0.060	9.713
-65	UKT 3.750 09/07/2021	121.723	10.464	0.075	9.667
-60	UKT 3.750 09/07/2021	121.200	10.479	0.094	9.621
-55	UKT 3.750 09/07/2021	120.675	10.502	0.115	9.575
-50	UKT 3.750 09/07/2021	120.149	10.535	0.141	9.529
-45	UKT 3.750 09/07/2021	119.622	10.576	0.170	9.484



All prices are indicative only. Click here for detailed disclaimer.

Source: Credit Suisse Locus

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