FORTEM CAPITAL

FRIDAY NIGHT 'LIGHTS

Correlation Straight

14th October 2016

When considering a typical Autocall investment product we know the investor receives a higher annual coupon for a dual index over a similar single index structure. The surface logic is simple: the payoff requires both indices to be above the defined level rather than a single index. The relationship between these indices, the correlation, determines the level of increase in the coupon over a single index investment product, and each bank makes an assumption based on that relationship.

Going in to a little more detail, the bank issuing the multi index product will pay more premium for being short the embedded correlation(s) and therefore long dispersion between the underlying indices: (a) the embedded European Style Knock-in Put and (b) the knock out optionality - both option returns are measured against the worst performing index in the structure. For this note at least, we shall ignore any currency issues.

When banks sell investment products on multiple underlying equity indices, such as an autocall, basket option, etc, they make certain assumptions as to what the expected correlation between those underlying indices will be. Hopefully it's intuitive that the lower the assumed level of correlation, on something such as the popular autocall product for example, the higher the potential investor returns could be. For lower correlated assets, the pricing models assume there is a higher probability for a greater dispersion of returns and understandably a greater risk for the investor than a single index investment.

Critically, there is also a more difficult relationship linking correlation to trading flows, bank inventory and the nature of the market participants. Banks that sell significant amounts of these structured products will be short correlation and whilst they can try and shift the risk via correlation swaps, variance swaps and options on baskets v basket of options, the sheer magnitude of product sold outweighs that bought back; or indeed, in order to buy it back they need to offer the hedge funds and institutional investors a decent price to buy the correlation. The active banks will have a short correlation position & if unable to shift the risk will, we believe, adjust future pricing accordingly to manage their position effectively and not mark the position based on the continuing demand.

In summary, this is of particular significance for a bank that is active in the structured product marketplace or exotic derivatives generally; typically, on the back of structured products placed with retail investors who do not hedge. **We have noted recently that banks who have been less active with this type of investment product in recent times appear to have greater capacity and so can be more aggressive on the pricing**.

The grid on the next page is an example of average coupons from various banks across the sector; both those regularly in this space, and those new (or returning) to the market. As you will see, where there is a second index, the pricing is markedly different.

Indicative Levels	Annual
FTSE/SX5E Defensive Autocall, 6Yr, £, 65% EKIP, barrier drops pa 5%	10.15%
FTSE/S&P, Income, 6Yr quarterly income, Daily Acc., Indices >50%	5.04%

Rates (bps)		
	Current	Week Chge
GBP 1yr	55.50	2.90
GBP 3yr	60.90	6.50
GBP 5yr	71.00	6.60

Equity Indices (%)		
FTSE 100	7019.4	-0.35%
S&P 500	2151.13	-0.12%
Nikkei 225	16856.37	-0.02%
Eurostoxx 50	2998.03	-0.08%

Currencies (%)		
GBPUSD	1.218	-2.04%

5yr Credit Spreads (bps)		
Citigroup	82.63	0.23
Credit Suisse	140.98	1.29
Deutsche	223.81	5.46
GS	96.70	-1.67
HSBC	81.25	3.79
JPM	64.21	-0.25
MS	93.40	-0.23

Commodities (%)		
Gold	1256.10	-0.08%
Oil	51.08	2.55%

3m Implied (vol pts)		
FTSE 100	15.53%	1.24%
S&P 500	14.42%	0.56%
Nikkei 225	19.50%	0.21%
Eurostoxx 50	20.97%	-0.53%

5yr Implied (vol pts)		
FTSE 100	19.61%	0.17%
S&P 500	20.99%	0.05%
Nikkei 225	19.31%	-0.28%
Eurostoxx 50	19.80%	-0.28%

Source Bloomberg / Partner Banks
Data as at 14th October, 9.00am

Upcoming events	
17th Oct	BOJ Quarterly Report
20th/21st Oct	Draghi speaks following Interest Rate announcement – along with other European Financiers

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Product	FTSE Defensive Autocall (60% EKIP)	FTSE/S&P Defensive Autocall (65% EKIP)	FTSE/ SX5E Defensive Autocall (65% EKIP)
Average coupon of less active banks in the Sector	7.20%	9.20%	9.90%
Average coupon of more active banks in the Sector	7.15%	8.40%	9.30%

Geek Corner:

Correlation is another way to determine how two variables are related.

In addition to telling you whether variables are positively or inversely related, correlation also tells you the degree to which the variables tend to move together. Correlation standardizes the measure of interdependence between two variables and, consequently, tells you how closely the two variables move. The correlation measurement, called a correlation coefficient, will always take on a value between 1 and – 1:

- If the correlation coefficient is 1, the variables have a perfect positive correlation. This means that if one variable moves a given amount, the second moves proportionally in the same direction. A positive correlation coefficient less than one indicates a less than perfect positive correlation, with the strength of the correlation growing as the number approaches one.
- If correlation coefficient is zero, no relationship exists between the variables. If one variable moves, you can make no predictions about the movement of the other variable; they are uncorrelated.
- If correlation coefficient is –1, the variables are perfectly negatively correlated (or inversely correlated) and move in opposition to each other. If one variable increases, the other variable decreases proportionally. A negative
- correlation coefficient greater than –1 indicates a less than perfect negative correlation, with the strength of the correlation growing as the number approaches –1.

Disclaimer

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