

# Equity correlation – explaining the investment opportunity

*Barclays Capital provides an overview of the equity derivatives flows and products that contribute to dealers’ correlation exposures, presenting several strategies that allow investors, of all types, to take advantage of the resultant opportunities*

One of the most talked-about metrics in the world of equity derivatives currently is correlation. While the basic intuition behind the metric is quite straightforward, correlation risks and exposures can be significant. Indeed, dealers have focused much time and effort into managing correlation risk. Moreover, many of these efforts have been aimed at isolating this risk to make it more efficient to trade.

## Correlation is in demand

We believe there are two primary flows that contribute to dealers’ overall short correlation positioning. The first flow comes from structured products and is the most important, in our view. As investors generally like diversification and limited losses, they prefer products with exposures to multiple underlyings and some sort of protective feature. Accordingly, many structured products are based on custom baskets and/or broad-based equity indexes where the vehicles of choice typically involve a long call or put option whereby investors limit their losses. Given the bespoke nature of these baskets, they are not generally traded in the market, so dealers generally hedge via options on each of the individual underlyings.

Taking options to be synonymous with volatility, the dealer is thus short volatility on the basket and long volatility on the basket components in this scenario. This position makes the dealer short correlation. Indeed, the less correlated the underlyings, the less volatile the basket or index will be. As dealers sell more basket options with various underlyings and hedge with the individual options on those underlyings, the larger their short correlation exposure becomes. While we have only mentioned basket options, there are other structured products, such as ‘worst-of’ reverse convertibles, that contribute to this exposure as well (see figure 1).

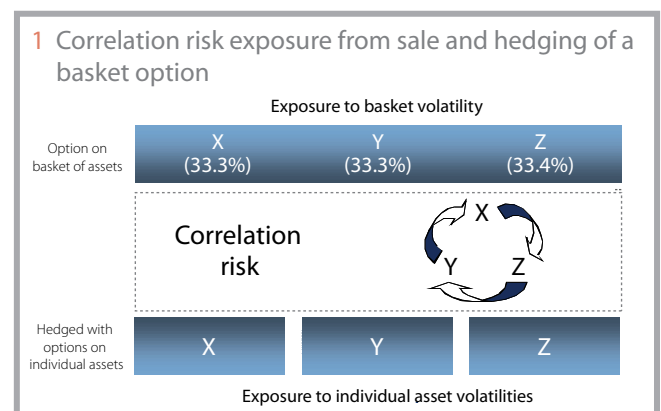
The second flow comes from the more vanilla end of the product spectrum. Traditional equity portfolio managers who use equity derivatives generally purchase puts to protect their portfolios or sell calls to generate additional yield. Given the ease of use and lower cost, portfolio managers generally purchase index puts. Moreover, portfolio managers often prefer to leverage their individual stock knowledge to choose candidates for call-overwriting (i.e. selling calls on shares they own) which also generates more premium than overwriting the index. Taken together, these flows again leave dealers with a short correlation exposure. More generally, we note that investors tend to sell

options on higher volatility underlyings (for example, stocks for single underlying reverse convertibles) and purchase options on lower volatility underlyings (for example, indices for optically higher participation rates in capital guaranteed notes).

While many of the above flows are over the counter and evidence is anecdotal at best, we are confident that these flows are responsible for a bulk of dealers’ short correlation exposures. We now consider why and how we think investors should take advantage of opportunities arising from this phenomenon.

## Opportunities for investors

On the back of the above flows and recent sell-offs in the equity markets, implied correlation (i.e. the market’s price for future correlation) has moved into the upper decile of its trading range of the last few years. Moreover, we note that correlation spikes are less likely now that we have moved into a higher volatility regime. This can be looked at intuitively by thinking about the likely effects of a market shock in a calm (i.e. low volatility) market where there is a greater probability of producing a unified move in stocks than in a market where shocks (i.e. high volatility) are the norm. As we move beyond the bull market of the previous few years, markets will be less likely to continue to rally in unison as they have in the past. Indeed, the market could move into more of a stock-picker’s mode whereby some stocks do well while others do not, thus decreasing correlations moving forward. Taking all of these factors together, we believe that products



and strategies that embed a short correlation view are priced attractively and should perform well over the next couple of years.

### Hedge funds

**Dispersion** – A versatile strategy in terms of potential variations, dispersion trades are typically implemented via several different vehicles. While dispersion is generally considered a mature strategy, innovation is still a key to success for dealers axed to sell correlation. As an example, Barclays Capital has recently developed several interesting variations on the dispersion theme, integrating features that can provide directional exposure by weighting dispersion according to specific parameters as well as structures leveraging our hybrid capabilities to exploit dispersion between asset classes.

While dispersion trades executed over 2007 have suffered as correlation levels crept higher over the year, now could be an opportune time to take up such strategies for a variety of reasons:

- Current implied correlations levels are elevated;
- correlation is bounded by construction and we are close to historical highs; and
- the probability of correlation spikes in the current higher volatility regime is lower.

**Correlation swaps** – Probably the most straightforward means of taking a position on correlation, correlation swaps are one of the only means of gaining direct exposure to longer-dated correlation (for example, 1–3 years). Given that correlation swaps pay out the difference between the realised correlation on a basket of securities and a fixed strike (defined as the market's estimation of future realised correlation), investors may use correlation swaps as a tool for implementing their views on the market 'price' of correlation relative to subsequently realised correlation. By taking a short position in a correlation swap, for example, investors can effectively monetise this differential, should the realised correlation on underlying stocks turn out lower than the strike. While seemingly simple on the surface, there are some subtle complexities. In particular, their path-dependent nature hinders fungibility among different maturities and the equal-weighting scheme does not accurately capture the correlation dynamics of market capitalisation weighted indices. Accordingly, liquidity is probably not as high in correlation swaps as it is in variance-based dispersion trades, for example, and they may not be suitable for managers whose reference period for performance measurement might be shorter than the tenor of the swap.

**Covariance swaps** – Recognising the shortcomings of correlation swaps and related trading strategies, Barclays Capital has recently begun trading equity covariance as a means of trading correlation. The attractiveness of this structure for investors derives from the dealers' hedging benefits. In particular, covariance swaps allow dealers to better hedge their risk exposures (for example, those linked to the sale of basket options) and can thus be priced more aggressively. To see this, consider the risk when a dealer sells a basket option on, for example, two assets. They are effectively short volatility on the basket:

$$\sigma_{portfolio}^2 = w_i^2 \sigma_i^2 + w_j^2 \sigma_j^2 + 2w_i w_j \sigma_i \sigma_j \rho_{i,j}$$

Hedging the third term with a correlation swap does not accurately hedge the position, which is in fact two times the product of the weighted individual standard deviations and their correlation. By entering into a covariance swap, on the other hand, the dealer hedges this third term more accurately.

Covariance swaps have been applied to other asset classes such

as FX for some time. Their use in equity space, however, is relatively recent and provides an exciting addition to correlation trading strategies available to investors.

### Institutional investors

In general, we find that fund managers use similar option overlay strategies including buying index options (typically puts) and selling stock options (typically calls), which may not be ideal given high implied correlations, especially on the intra-index level. By selling index options rather than buying them, for example, managers may effectively monetise the relatively 'richer' implied correlation of index options relative to stock options. Similarly, buying stock options (for example, baskets of puts), rather than selling them, takes advantage of the relatively cheaper implied correlation and premia relative to index options. Traditionally, hedge funds and other advanced investors have taken advantage of these apparent imbalances through volatility arbitrage strategies, however, there is no reason why discretionary fund managers should not benefit as well, allowing them to capture alpha in the process.

### Retail/private banking

In the retail and private banking segments, product innovation has made it possible to import many of these same hedge fund strategies into products that suit the investment requirements and risk appetite of individual investors. It is possible to provide exposure to dispersion strategies, for example, in a variety of formats including notes and UCITS III funds, while at the same time providing necessary liquidity and transparency.

At the more formulaic end of the product spectrum, current high implied correlations (and volatility) are enabling dealers to provide a number of new structures that were not feasible in terms of pricing even a year ago. In effect, over the past few months it has become possible to provide investors with a number of products structured around the highest or 'best' underlying rather than the worst-of structures that have been prevalent in the market. Other structures taking short correlation positions are also allowing individual investors to express a particular investment view which may be less dependent on market direction than the co-ordination of future market movements, enabling them to opportunistically sell correlation at the same time.

Given the structural flows in equity derivatives markets, correlation will undoubtedly continue to be one of the most discussed topics. From the dealer's perspective, these flows continue to challenge product development and innovation as structuring desks work to align investor objectives with pricing considerations. The good news for the investor is that there is now a range of structures available that enable them to take advantage of correlation movements more directly.



**BARCLAYS  
CAPITAL**

**Aaron Brask**

Head of Equity Derivatives Research  
London  
T. +44 (0)20 7773 5847  
E. aaron.brask@barcap.com

**Jeffrey Baker**

Equity Derivatives Structuring London  
T. +44 (0)20 7773 8708  
E. jeffrey.baker@barcap.com

www.barcap.com