

Myth or truth – equity dispersion has a long volatility bias during crises?

Equity dispersion seems to offer the implausible; a long volatility exposure during crises alongside positive carry in most other market scenarios. The issue with the long volatility claim is that it is difficult to substantiate in all but the most extreme scenario, as real crises are few and very far between and no two are the same. It is particularly challenging in the case of dispersion, as it is a relatively ‘new’ strategy having only been actively traded for circa 20 years, possibly 30 at a stretch.

What is equity dispersion?

The primary rationale for the trade is that the average quoted implied correlation between single stocks is higher than subsequent realised correlation. Investors are willing to pay a premium for the uncertainty of future correlations between securities, hence overpay for index options to benefit from correlation spikes between stocks. This relationship holds during normal markets but breaks down during equity market crises, when both implied and realised correlation spike higher. To capture the risk premium, one sells 1 unit of equity index volatility and buys a fraction of a unit of single stock volatility. This fraction is determined by the relative levels of index and single stock implied volatility, with the scheme known as theta neutral dispersion.

Theta neutral dispersion is highly correlated to and has a similar payoff profile to a short volatility trade, which is not necessarily desirable during market stresses when volatility usually increases. The more widely traded variant is vega neutral dispersion, where equal units of single stock and index volatility are traded. In effect, a percentage of the positive carry from the expensive correlation has been used to purchase a long single stock volatility exposure. Over the long run, one would expect the long volatility exposure to lose money. Fulcrum assumes the long volatility bias to cost around one third of the expected carry – and indeed this has turned out to be our experience in practice – but it is a price worth paying if the strategy can deliver positive returns during a severe crisis as well as in normal market conditions.

There are many implementation variants, but here we will focus on the path followed by Fulcrum, vega neutral volatility swap dispersion. Fulcrum has generally avoided complexity and the final section of this piece highlights why to date, corridor dispersion has not been included in the portfolio.

Performance up until the outbreak of corona virus

The strategy is short correlation and long volatility, so the backdrop of 2018 provided a perfect foil. The escalation of Trump’s trade war with China drove sharp sector rotation as the market sold off aggressively into year end, thereby benefiting both aspects of the trade. The sector rotation of 2018 continued into the first half of 2019, but returns were crimped as implied volatility fell back. The second half of 2019 proved challenging as realised volatility drifted down to extreme low levels whilst there were three bouts of high realised correlation.

An enduring feature of 2019 was the difficulty in maintaining strategy risk (i.e finding attractive opportunities to replace risk rolling off). Fulcrum is a strong proponent of dispersion being a discretionary strategy with regards to entry points/levels. In the run up to the middle of February 2020, Fulcrum ran the dispersion strategy under risked (target risk being around 8 to 10%). This was an important feature once the current crisis started, as it allowed us to add to positions at very good levels as well as stopping us from having to reduce leverage in the strategy as market risk soared.

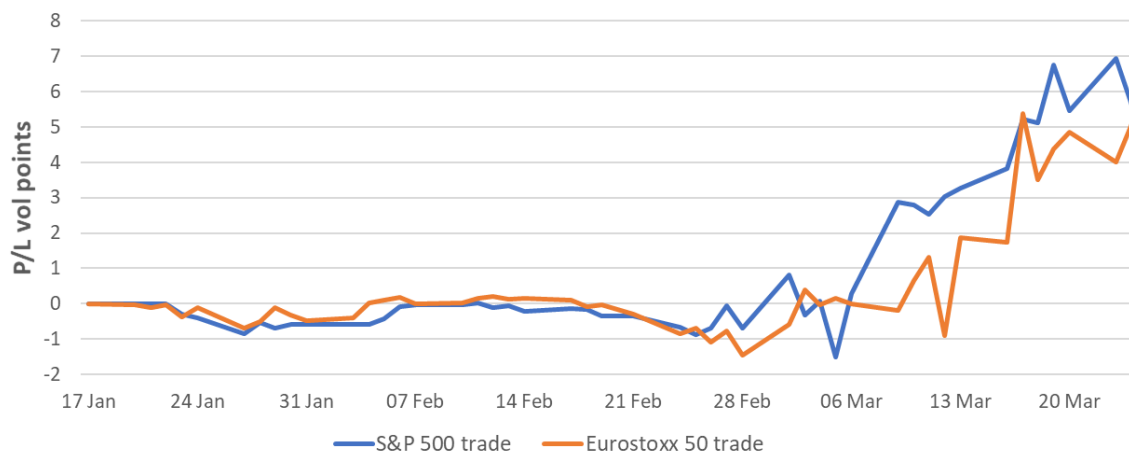
The virus selloff

As we reach the end of March, we have witnessed a 30% correction in the S&P 500 within a month and market volatility having exceeded that during the market crisis of 2008. This has been a robust test of the dispersion strategy and the result has been a textbook response. Figure 1 is the P/L evolution in volatility points since the middle of January of two bespoke vega neutral volatility swap dispersion packages held by Fulcrum. Both were recently initiated with initial maturities of around 12 months. As a guide, expected returns are of the order of 1.5 volatility points in normal market conditions, which is consistent with meeting our return objective.

Towards the end of January, the market grew concerned about the virus in Wuhan, but the reaction was short lived, with US and European implied volatility and correlation levels falling back in February. The maximum impact was around a 0.5 volatility point loss on longer dated contracts and substantially less on shorter dated contracts.

The main phase of the crisis unfolded with S&P 500 12 month ATM implied volatility and correlation trading around 13% and 40% respectively. As we have seen many times in the past, the initial reaction of the market is to sharply mark-up implied correlation and the very front end of the volatility term structure. The impact of the increase in implied correlation into the mid 50's had a negative impact on the value of trades which was almost offset by the increase in single stock implied volatility in the US. In Europe, the gain on the singles was not as strong relative to movement in the implied correlation, resulting in a drawdown of 1 volatility point on longer dated trades. This is in distinct contrast to the mark down on trades during the technical volatility spike of February 2018, where implied correlation spiked, but the move in long dated single stock implied volatility was muted.

Figure 1 – Performance of live Fulcrum US and European volatility swap dispersion trades



Source: Fulcrum Asset Management LLP & Bloomberg L.P.

Jan 21 S&P 500 bespoke vol swap dispersion. Index strike 17.3. Trade executed 04/12/19 with implied correlation at 46%

Dec 20 Eurostoxx bespoke vol swap dispersion. Index strike 16.3. Trade executed 06/01/20 with implied correlation at 51%

During the selloff, 12 month S&P 500 implied correlation peaked in the high 70's, while single stock implieds jumped from 30% at the end of February to the mid to late 50's. The net result was a strong positive P/L associated with the "long volatility bias". It confirms that whilst the trade is not a tail hedge in the true sense of the term, as it reacts with a lag and initially has a negative mark to market (as we have consistently said), when volatility moves to extreme levels, the long volatility component takes over.

Managing current exposure

At present, the P/L of the trade examples above are largely a function of market implied variables. Should one now look to lock in profits or run them?

Historically when markets witness the volatility recently seen, it takes many months to bleed out of the system. In other words, we are unlikely to see S&P 500 realised volatility sub 10% much before most current live dispersion trades have expired, ie late 2020. A significant difference between today and the financial crisis is that implied volatility has been very low for the last 12 months, whereas in early 2008, it had already risen significantly from the lows of 2005 / 06. In 2008, only a handful of stocks actually hit the cap on 1 year variance swaps of 2.5 times strike including names like Fortis, AIG and Volkswagen and no mainstream equity indices reached this level on a realised basis. There is a distinct possibility that the volatility caps will be hit on both stock and index contracts this time around.

An interesting analysis can be undertaken looking at the final settlement value of current dispersion trades assuming the stock evolution from the latter stages of the financial crisis. Two data sets were created. The first starts in mid-October 2008, where we are through the sharp initial stages of the correction, but the market has not yet reached its nadir. The second data set assumes the market is at its nadir, ie March 2009. Fortunately, most of the stocks in our European baskets were trading at this point and a suitable substitute found if that was not the case, eg a blend of Renault and Peugeot as a substitute for Fiat. In order to generate a "fair" volatility series for the Eurostoxx index, the index was recreated using current stock weights combined with historical stock evolution. This is important, as the composition of the index was very different back then, with a heavy overweight in financials. The Eurostoxx was chosen for the analysis given its relatively low number of constituents.

Table 1 – Impact of historical periods on the Fulcrum sample Eurostoxx dispersion trade

	strike	Mid Oct 08 onwards		Mar 09 onwards	
		Realised	Cap hit	Realised	Cap hit
Euro Stoxx 50 Pr	16.3%	40.0%		30.4%	
ANHEUSER-BUSCH INBEV SA/NV	23.7%	59.2%	x	48.6%	
BAYERISCHE MOTOREN WERKE AG	23.6%	59.1%	x	48.6%	
COMMERZBANK AG	37.7%	94.3%	x	75.7%	
DEUTSCHE POST AG-REG	21.7%	54.3%	x	42.9%	
FRESENIUS MEDICAL CARE AG &	24.6%	32.3%		27.3%	
FRESENIUS SE & CO KGAA	25.1%	48.4%		36.8%	
SOCIETE GENERALE SA	28.9%	72.3%	x	60.5%	
THALES SA	23.8%	39.1%		34.8%	
INFINEON TECHNOLOGIES AG	33.9%	84.7%	x	83.2%	
INDUSTRIA DE DISENO TEXTIL	22.1%	43.3%		34.2%	
KERING	28.9%	65.3%		45.6%	
DEUTSCHE LUFTHANSA-REG	31.9%	52.1%		44.8%	
NOKIA OYJ	37.4%	57.1%		50.5%	
ORANGE	18.4%	34.1%		28.1%	
RENAULT SA	33.1%	82.7%	x	69.5%	
SANOFI	20.9%	41.3%		29.6%	
SIEMENS AG-REG	22.2%	55.4%	x	42.2%	
TELEFONICA SA	21.5%	41.3%		34.5%	
THYSSENKRUPP AG	38.6%	71.0%		59.6%	
UNICREDIT SPA	33.1%	82.7%	x	65.5%	

Source: Fulcrum Asset Management LLP

Taking the Eurostoxx dispersion example in Figure 1, Table 1 looks at the estimated impact of the two regimes on the terminal value of the trade when added to the current realised volatility history to date. The continuation of the high volatility regime as the market continues to fall and subsequently recovers, results in the index volatility almost hitting the contract cap of 2.5 times strike, whilst 9 of the 20 names hit their respective cap. The net result was a 6.4 volatility point gain on the trade. To put this number in context, the current accrued realised P/L to date is 3.3 volatility and live market to market is 5.3 volatility points. Therefore, there is potential value left in the trade if this scenario plays out.

On the assumption that the market has now bottomed, the volatility in the recovery phase was lower, with some stocks close to, but none breaching the cap. The terminal payoff was 5.4 volatility points, so marginally lower than the first scenario and in line with the current mark to market.

In Table 2, the four longer dated Eurostoxx dispersion trades held by Fulcrum are analysed. A similar pattern to the example above emerges, but if we look at the scenario where markets are more volatile than the late 2008 / 09 period, it is possible that all the single stock components hit their respective volatility caps, triggering the maximum payment on individual trades, which is significantly higher than the other two scenarios. Note that it is extremely unlikely at this point that all the single stocks hit their vol caps, but the index does not.

Table 2: Analysis extended to the 4 longer dated Eurostoxx trades held by Fulcrum

Trade	Expiry	Mid Oct 08 onwards	Mar 09 onwards	Max payout
1	Dec-20	9.3	5.5	13.9
2	Dec-20	7.4	6.3	15.6
3	Dec-20	6.4	5.4	14.2
4	Jun-21	9.3	5.5	13.9
	Average	8.1	5.7	14.4

Source: Fulcrum Asset Management LLP

Taking the 3 potential scenarios, there is significant potential upside left in the current portfolio.

Corridor dispersion

In the last 12 months, there has been a strong move towards trading variants of vanilla volatility swap dispersion, with corridor dispersion arguably the focus. Corridor dispersion suits banks trading books as the trade is only exposed to single stock volatility when stocks trade within a defined range, usually 70% to 110% of the initial stock price, thereby matching the exposures generated within their structured product books. The advantage to the investor is that they cost around 0.5 to 0.75 volatility points less than the vanilla trade. The disadvantage is if the equity market rallies or falls substantially, elements of the exposure fall away. Had the Eurostoxx trade described earlier been transacted on corridor basis, rather than earning 6.4 volatility points, if we repeat the experience of mid October 08 through 09, one would actually print a loss of circa 1.5 volatility points. As the market sells off, quite quickly, names such as Renault and Lufthansa breach the lower barrier and their exposure drops out of the package. One is potentially left with a portfolio of long volatility positions in low volatility names such as Sanofi and Orange set against a short index volatility position, which is still being driven by the full range of index constituents including the very volatile names. The trade therefore switched from having a long volatility bias at initiation to a short bias, as the more volatile names drop out on the single stock basket.

Corridor dispersion adds diversification to a dispersion portfolio and often outperforms the vanilla equivalent in normal markets by a small margin but has some less desirable characteristics in more extreme markets, which we are currently in. Fulcrum made the active decision to capture returns from left tail events and so excluded corridor dispersion from the portfolio. It appears to have worked this time around.

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