

Investors in the oil markets need to be prepared for significant multi-day drawdowns. As of 15 December 2014, our 99% 10-day VaR and ES were -15.4% and -24% respectively.

### Oil Market Volatility

Plunging oil prices have been making headlines recently. Against a background of investor nervousness about the timing of the next major market correction it is hardly surprising that increased volatility in a critical commodity is focussing attention. However unexpected the trigger for recent turmoil may have been, our tail models predicted that daily and multi-day moves of the size which have appeared since November 28th were all too likely.

### Risk Predictions and Daily Returns in WTI

Omega Analysis' advances in statistical technology allow risk measurements of unprecedented accuracy in financial data series. 1-day Value at Risk (VaR) and Expected Shortfall (ES) measured from short samples of historic data have a high degree of predictive power out of sample. Over extended time periods, VaR breaches are in excellent agreement with the target frequency and ES breaches are consistent with the (time varying) tail model's predicted frequency. Because it is breached relatively rarely, ES can be used to size market exposures with a high degree of confidence.

On November 28th the price of WTI fell by over 10.5%.

This was a breach of the 99% 1-day Expected Shortfall, which at the close on the previous day of trading, was - 6.7%. The Expected Shortfall is the *average* loss conditional on a VaR breach, so losses in excess of ES have to occur from time to time. We estimated the probability of an ES breach as 1 day in 340, scarcely a rare event. Using the tail model which produced the ES of -6.7%, a loss of 10.5% or more would be expected in day in 4.7 years. In fact the last time that such a loss was recorded was in January of 2009.

### Multi-Day Risk Measurement

Recent advances have allowed Omega Analysis to extend to returns for 5 and 10 day periods the same out of sample predictive power which Omega Metrics VaR and ES provide for daily returns.

There have been VaR breaches at the 99% level in the 5-day returns on WTI oil. None of these were close to being ES breaches. As single day losses have accumulated, the worst 10-day losses approached 19% (as of 15 December). But our 10 day ES was already reading -17.4% at the beginning of November.

So, as in the case of 1-day price movements, the data indicated the potential for the recent outside losses prior to their occurrence.

As oil price volatility continues, investors in this market need to be prepared for significant multi-day drawdowns. As of 15 December, our 99% 10-day VaR and ES were -15.4% and -24% respectively.

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