

From: Daniel Sabba <[REDACTED]>
To: "jeffrey E." <jeevacation@gmail.com>
CC: Paul Morris <[REDACTED]>, Vahe Stepanian <[REDACTED]>, Richard Kahn <[REDACTED]>
Subject: RE: short crude vol strategy - follow-up analysis
Date: Thu, 05 Feb 2015 22:49:54 +0000
Inline-Images: image001.png; image002.png; image003.png; image004.png; image005.png

Classification: **Public**

Jeffrey,

Our structuring desk did further analysis on the transaction – please see below. As discussed, let's speak further tomorrow morning.

Below numbers are still as of EOD yesterday:
Here is the same table as earlier and additional explanation regarding what it means.

Contract	Vol strike	Strike Date	Realized vol	Implied - Realized	Current Implied
CLH5	60%	13-Jan-15	79%	-19%	84%
CLJ5	43%	13-Jan-15	77%	-33%	56%
CLK5	42%	14-Jan-15	73%	-31%	54%

Let's focus on CLJ5 (April15) and similar applies to the other nodes. Vol strike was 43% and realized vol has been 77%. If the index had exposure only to this contract and not at all to the other contracts, and if realized vol up to expiry of this contract were also 77% then the implied-realized diff is 43%-77% = -34%. That is massive. This does not mean that you would lose 34% of the notional, but at least illustrates that you should expect the loss to be big. How much you actually lose is a daily path dependent calculation and cannot be summarized in a few sentences. If realized vol was EXACTLY same as implied vol also, the gain/loss would not be zero, but is a path dependent function.

Back of the envelope, with a 34% implied-realized difference, one can expect a loss of 17% because the index has a vega of, on average 0.5% of index notional; but at any given point in time even with vols unchanged, the vega could be anywhere between 0.33% and 0.67% (this is in steady state with vols unchanged, with changing vols, it could be a wider range).

As we know, the strategy of the index is to sell 3 straddles (collecting premium); and delta hedges daily at the close (in other words, trades the gamma). One would expect to lose money trading the gamma and the thesis behind the index is that generally the money you lose trading the gamma < the premium collected. Since 13 Jan, on average the opposite has been true. Trading the gamma has been expensive because the underlying futures prices have moved a lot day to day, which is what we are trying to capture in the realized vol numbers shown above. The straddles are also marked to market daily using settlement prices; if implied vol has increased, there is a further loss on the mtm. The last column in the table above shows where current implied vol is.

From: Daniel Sabba
Sent: Thursday, February 05, 2015 1:30 PM
To: 'jeffrey E.'
Cc: Paul Morris; Vahe Stepanian; 'Richard Kahn'
Subject: RE: short crude vol strategy - follow-up analysis

Classification: **Public**

Jeffrey,

Per my previous email, WTI moved down over 8% on Wednesday and up 7% on Tuesday. As discussed at our meeting, this level of high realized volatility is very negative to a short straddle with daily delta hedging strategy. We refreshed the analysis below to include the Tuesday's and Wednesday's moves.

We would like to point out this trade has moved over 10% down, and ask you on whether you continue to want to hold it.

Trade date: 13-Jan
Valuation date for all the numbers below: 4-Feb
We have rounded various numbers for ease.

Index return since trade date: -10.84%

The index has lost money basically because realized vol has been much higher than implied, and also implied has gone up a lot (however, we wouldn't pay a lot of attention to the implied going up a lot; since finally what will count as more days pass is what realized is doing). Some stats on this are below.

Contract	Vol strike	Strike Date	Realized vol	Implied - Realized	Current Implied
CLH5	60%	13-Jan-15	79%	-19%	84%
CLJ5	43%	13-Jan-15	77%	-33%	56%
CLK5	42%	14-Jan-15	73%	-31%	54%

This loss has occurred over a period of 15 Index Business Days. Looking back since index inception date, we tried to see how many times such a loss would have occurred over a period of 15 days. This 15 Index Business Day performance represents the 0.6th percentile.

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From: Daniel Sabba
Sent: Tuesday, February 03, 2015 3:19 PM
To: 'Jeffrey E.'
Cc: Paul Morris; Vahe Stepanian; Richard Kahn
Subject: short crude vol strategy - follow-up analysis

Classification: **Public**

Jeffrey – this is the analysis we put together and alluded to in the meeting today. It evaluates the performance of the short crude vol strategy since Jan 13th, when we traded. As discussed, sharp moves up in oil (WTI is up 6% intraday today) are also negative to a short straddle strategy that is delta hedged daily, as it causes realized vol to increase, potentially beyond expectations. If one expects this environment of high realized vol to be short lived, the trade continues to make sense. If one expects it to be a continued paradigm, it might make sense to revisit holding this strategy.

Trade date: 13-Jan
 Valuation date for all the numbers below: 2-Feb
 We have rounded various numbers for ease.

Index return since trade date: -4.7%

The index has lost money basically because realized vol has been much higher than implied. Some stats on this are below.

Contract	Vol strike	Strike Date	Realized vol	Implied - Realized	Current Implied
CLH5	60%	13-Jan-15	67%	-7%	81%
CLJ5	43%	13-Jan-15	65%	-22%	50%
CLK5	42%	14-Jan-15	61%	-20%	48%

This loss has occurred over a period of 13 Index Business Days. Looking back since index inception date, I tried to see how many times such a loss would have occurred over a period of 13 days. This 13 Index Business Day performance represents the 6th percentile. Here is a graph showing performances over a 13 day period:



Also useful, below chart shows implied vol atm mid for the 2nd month futures over the last 1y:

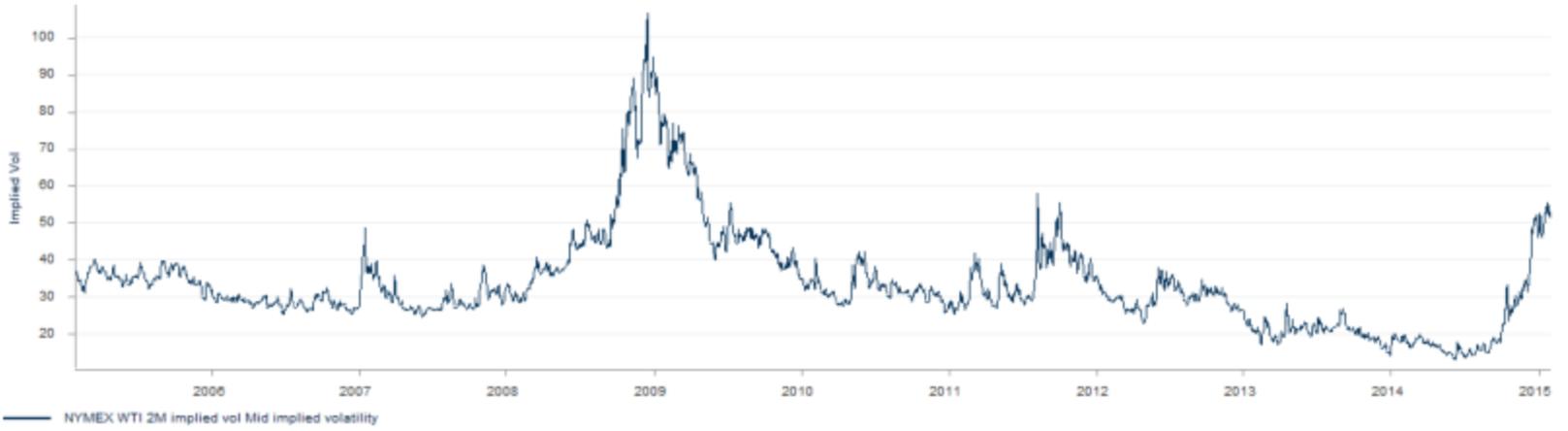


Source: Deutsche Bank Global Markets Research (indicative prices)

Generated at 10:28, 03-Feb-2015.

And below is the same chart over the last 10 years:

NYMEX WTI 2M implied vol Mid implied volatility



— NYMEX WTI 2M implied vol Mid implied volatility

Source: Deutsche Bank Global Markets Research (indicative prices)

Generated at 10:37, 03-Feb-2015

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