



MARCH 2015 NEWSLETTER

Dear Investor,

The Global Volatility Summit brings together volatility and tail hedge managers, institutional investors, thought provoking speakers, and other industry experts to discuss the volatility markets and the roles volatility can play in institutional investors' portfolios.

We are just days away from the 2015 GVS on March 11th at Pier 60, Chelsea Piers in New York City. Registration for the 6th annual event has been closed, but if you have not had the chance to register and would like to attend, please email info@globalvolatilitysummit.com for an update on capacity.

Macro Risk Advisors has offered the latest report in our newsletter series with the GVS community, titled 'A Look at the Price of Volatility around Energy Market Draw-Downs'. In the note, MRA provides substantial analysis of a hot topic in the volatility space currently.

Cheers,

Global Volatility Summit

2015 EVENT UPDATE

**The Sixth annual Global Volatility Summit ("GVS") will take place
March 11th, 2015 at Pier Sixty at Chelsea Piers in New York City**

The following managers will be participating in the 2015 event:

BlueMountain Capital
Capstone Investment Advisors
Capula Investment Management
Dominicé & Co. – Asset Management
Fortress Investment Group
Ionic Capital Management
JD Capital Management
Parallax Volatility Advisors
Pine River Capital Management
Saiers Capital

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A Look at the Price of Volatility around Energy Market Draw-Downs

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Introduction

A substantial body of empirical research in derivatives markets has been devoted to models and methods that effectively predict volatility. Some argue that statistical models motivated by time series analysis are most effective. Another area of research has focused on determining the usefulness of the market price of options as a forecasting tool for future volatility. In this piece, we discuss the recent plunge in the price of crude oil and the associated spike in volatility. Our analysis provides context on the relationship between return and volatility in crude and looks at the option market's predictive power.

Since the inception of the USO in 2006, there have been 13 drawdowns in excess of 10%, using 3 month rolling periods. In the table below, we illustrate these and show the corresponding starting and maximum level of the CBOE's OVX index (a measure of one month implied volatility).

USO Drawdowns (using rolling 3-month periods)

Start Date	End Date	Length	Drawdown	OVX at start of drawdown	Max OVX
7/15/08	5/7/09	206	-64.6%	47.2	100.4
6/23/14	3/2/15	174	-46.2%	18.8	63.1
2/27/12	8/14/12	119	-27.6%	33.8	42.3
4/6/10	11/2/10	148	-24.3%	29.7	47.2
5/2/11	10/26/11	125	-23.6%	30.4	61.8
6/12/09	10/13/09	86	-19.1%	47.3	52.7
9/9/13	2/12/14	109	-15.7%	28.1	27.9
9/17/12	1/11/13	80	-15.3%	34.1	36.6
10/23/09	3/31/10	109	-14.4%	40.5	43.1
1/31/13	6/14/13	94	-12.6%	22.9	31.1
1/3/08	2/15/08	31	-12.0%	37.2	37.1
11/21/07	12/31/07	27	-11.2%	33.9	38.5
8/1/07	9/7/07	27	-10.6%	30.7	37.0

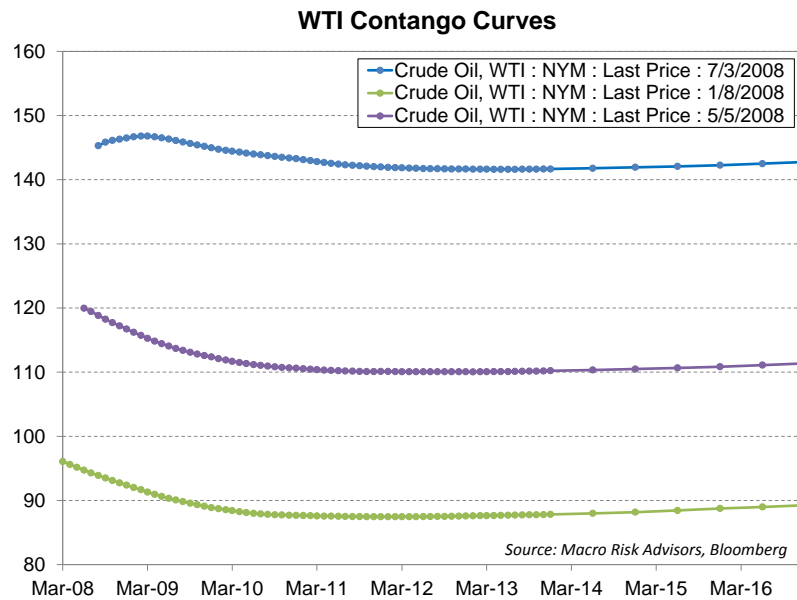
Source: Macro Risk Advisors, Bloomberg

From early 2006 to the present, the OVX had a mean of 36.2%. Looking solely at the days preceding the drawdowns highlighted above, the OVX averaged 33.4%. At face value, this differential would suggest the options market provided no information on the impending selloffs. It was not until after these meaningful drawdowns that implied volatility actually picked up, with the OVX peaking at 14 points higher on average during the moves lower. It is noteworthy that over this time frame, there were substantial shifts in the overall volatility environment. In 2006, for example, the VIX averaged 12.8. In 2008, it averaged 32.7.

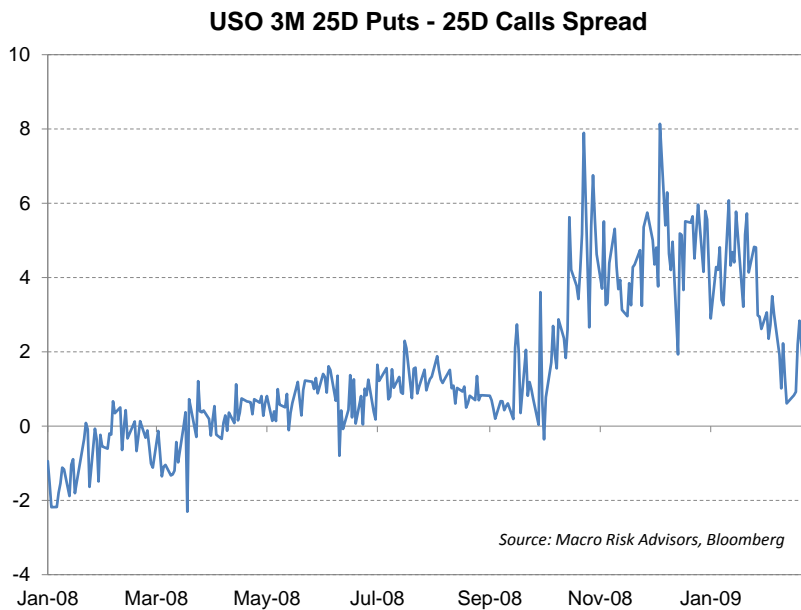
On the surface, this data highlights the extent to which the USO options markets failed to foresee these downturns. In exploring some of these larger moves, we are able to illustrate how truly offside the volatility market was ahead of many of these episodes.

Peak and Trough of 2008

July 2008 marked the price peak of crude oil with WTI front month contracts topping \$145 per barrel. At this time, the futures market shifted from the massively downward sloping curve present throughout 2007 and early 2008, to one that was flat with relatively steep contango in the front few months.



Despite the curve indicating waning demand, the reaction in the options market remained muted even as oil began trading off into the summer of 2008. Crude implied volatility stayed in the mid 40's, the same level it had been trading at for months, and skew (as measured by 25 delta puts minus 25 delta calls) remained extremely flat. Only with the large price swings and high realized volatility in September 2008 did skew pickup, at a time when oil was already down \$50 from the peak.



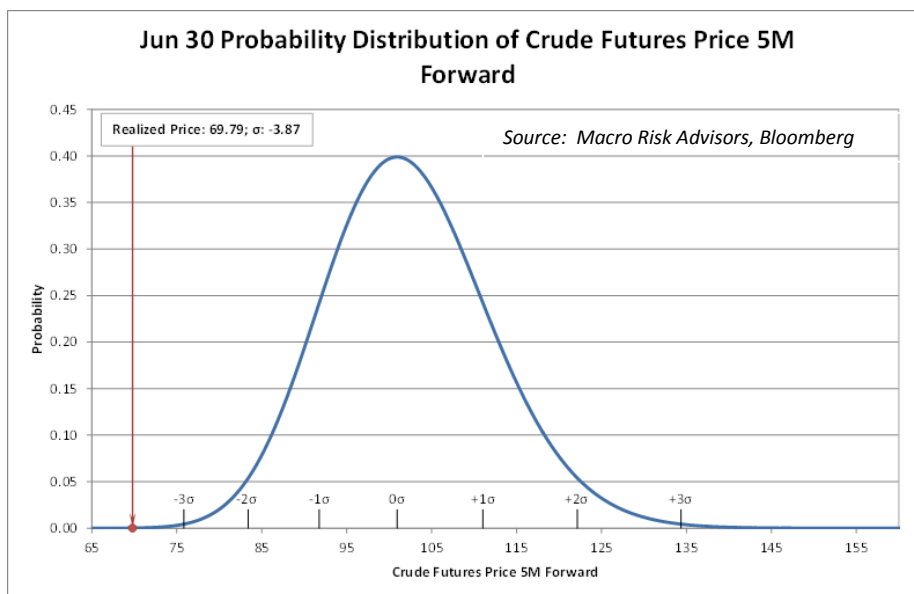
Over the next few months, oil dropped 65% from its peak. One month realized volatility on USO was as high as 93%, the OVX topped 100, and skew on the downside blew out. Granted, these price moves occurred at the peak of a credit crisis. In November 2008, the VIX was at 5x the level it was in August

2008. Crude volatility although high, was only 2x in comparison. The move in crude most likely attributable to the deflationary panic and surge in the dollar that resulted from 2008. And yet, looking back, it also seems apparent that the options market did not pay sufficient attention to the early warnings sent by changes in the crude futures curve in early 2008.

Given the imploding credit crisis, we can merely point out the draw-down in crude prices in 2008 as a period of high volatility across asset classes. A more recent episode of risk in the energy market is the sell-off in crude this past summer. In our view, this is a more interesting period to study option prices as a forecasting tool for future volatility.

Crude Oil Sell-Off of 2014

The more recent illustration of the energy option market's struggle to correctly price volatility can be seen in the second largest sell-off in crude oil over the last decade. In June of 2014, the OVX was trading 14.50, the lowest level since the inception of the index. To put this in perspective, the OVX was implying less than a 1% move per day for oil prices, and just 4 points higher than the VIX. The coming months, however, would bring a 46% drawdown with one month realized volatility in the mid 60's. Below we use this implied volatility level to draw a 5 month price distribution for crude and show that reaching a price of 70 by December 2014 amounted to a nearly 4 standard deviation move.



The November 2014 OPEC meeting acted as a major catalyst in the energy markets in the late summer and fall of 2014. On Nov 27th, the organization of major oil producing nations decided to keep oil output levels unchanged. Members including Saudi Arabia, Qatar, Kuwait and the UAE decided against supporting crude, possibly in order to squeeze their higher cost competitors out of the market.

Although many in the investing community were watching the negotiations in the Middle East with heightened anticipation, the equity volatility markets were telling a much different story. Option prices ahead of the OPEC meeting were predicting relatively normal markets and the expectation of a subdued reaction. Three days prior to the meeting, USO Nov 28th at-the-money straddles were pricing in only a 3.7% move for the entire week. XLE, the broad market index of energy stocks, was pricing in just a 2% move that week, and even more shockingly, an aggregate 3% move for the entire two weeks ending December 5th.

Weekly Straddle Costs

Expiry	USO	XOP	OIH	XLE
Nov 28th	3.7%	4.5%	2.8%	2.2%
Dec 5th	5.3%	6.1%	4.3%	3.1%

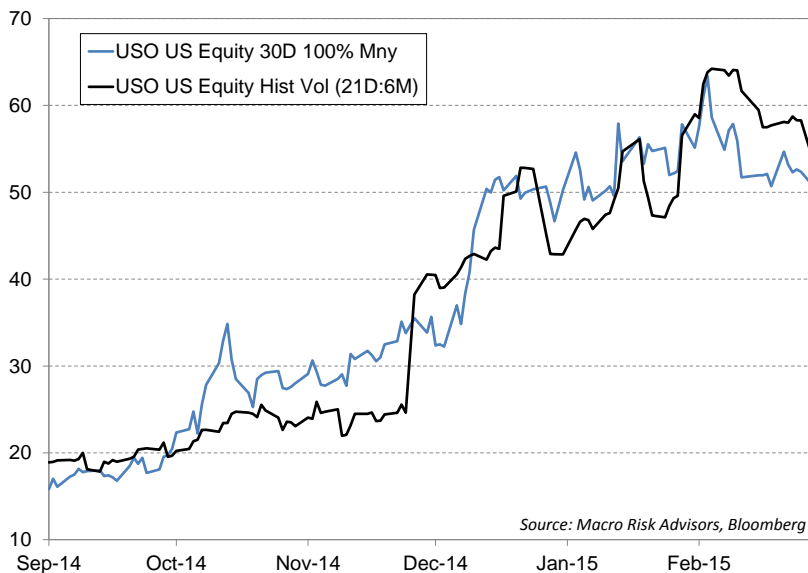
Source: Macro Risk Advisors, Bloomberg

What seemed to be a widely publicized event was, in retrospect, massively mispriced in the volatility markets. Following the OPEC announcement to keep output unchanged, front month crude contracts sold off 10%, XLE sold off 6.5%, and XOP (which tracks the more reactive exploration and production companies) was down almost 13%, and another 6% the following week!

To put this in the context of option prices, on Monday November 24th, with USO trading at \$28 and OPEC meeting on November 27th, the December 5th 28 strike put cost \$0.45, offering an investor downside protection in USO for about 1.5% of spot. On Friday November 28th, USO closed at \$25.58 (sub-\$25 by December 5th), and options would be up over 5x with more than a week of time value left.

Subsequent to the OPEC meeting, front month WTI contracts continued to slide, selling off another 33% and eventually hitting a local bottom of sub \$45 in early January. Even still, the options market continued to underprice these moves, with implied volatility moving only gradually higher for several weeks following the event, and trailing realized for much of the winter.

USO Implied vs Historical Vol



Source: Macro Risk Advisors, Bloomberg

Where Do We Stand Now?

Assessing the current landscape, the options and energy markets are predicting different outcomes once again. In just four weeks since the low in oil prices, investors have flocked to buy energy related stocks, ETFs, and levered products. Crude, however, is hovering around the lows despite a short rally in early February, and the WTI futures curve predicts prices to stay under \$60 for 2015. So why would these investors flock to energy-related products? Do they believe we have reached the bottom?

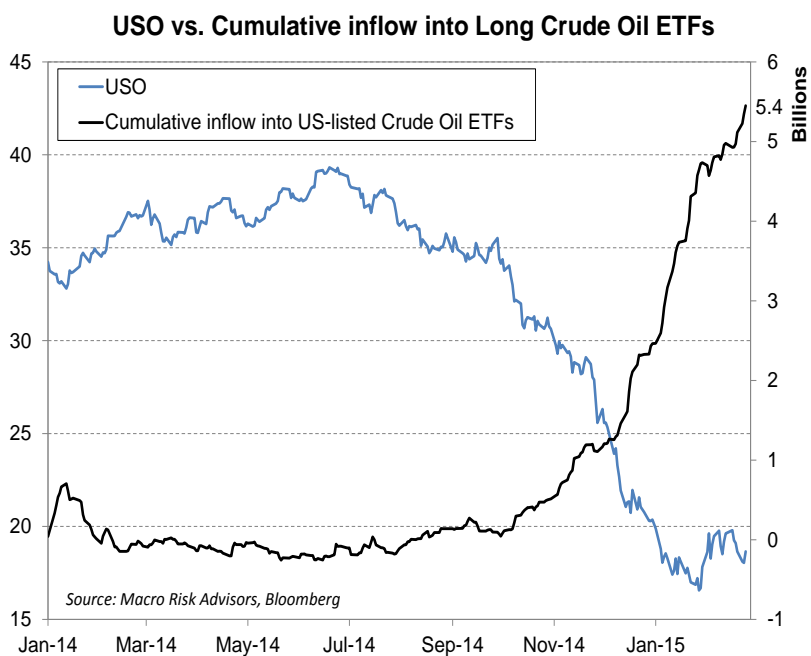
Since the middle of January, XLE is up 9%, XOP is up 20%, and more highly levered names like Goodrich Petroleum and Sandridge energy are up over 50%. Even more shocking are the inflows into the USO and crude levered ETFs listed below.

List of US-Listed Levered Crude Oil ETFs

Ticker	Name	Leverage	Market Cap	Exposure	Approx. CLJ5 Position
UCO	ProShares Ultra Bloomberg Crude Oil	2	867,968,201	1,735,936,401	34,670
UWTI	VelocityShares 3x Long Crude ETN	3	627,866,699	1,883,600,098	37,619
SCO	ProShares UltraShort Bloomberg Crude Oil	-2	307,565,918	(615,131,836)	(12,285)
DWTI	VelocityShares 3x Inverse Crude ETN	-3	135,916,306	(407,748,917)	(8,144)
DTO	DB Crude Oil Double Short Exchange Traded Notes	-2	52,640,499	(105,280,998)	(2,103)
DNO	United States Short Oil Fund LP	-1	14,235,000	(14,235,000)	(284)
SZO	PowerShares DB Crude Oil Short ETN	-1	5,075,280	(5,075,280)	(101)

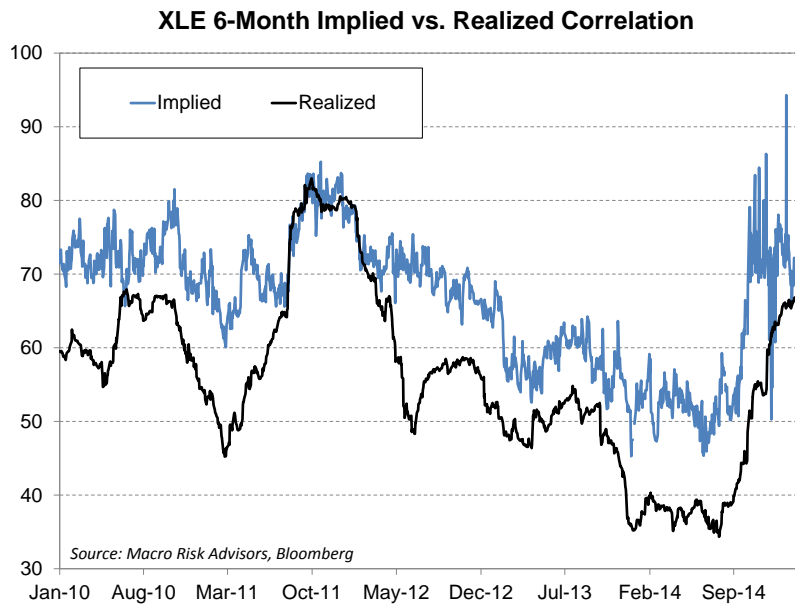
Source: Macro Risk Advisors, Bloomberg

These products, often with a high retail investor base, can have a meaningful effect on the market. Since the beginning of 2015 alone, over \$3 billion has been invested cumulatively into long crude ETFs. That equates to 60 million barrels of oil invested. Put differently, the value of these ETF inflows equates to the value of buying the daily oil consumption of the entire country of Brazil, or 2x that of the United Kingdom on each trading day since the beginning of the year.



As stated previously, the options market is telling a story different than this bullish activity. Short dated WTI implied volatility remains above 50% and skew is very well bid to the downside. There continues to be demand for protection in the market, with an average of 165k puts trading in USO each day this year (compared to 110k calls), as well as put buying in the energy sector ETFs.

In addition to skew analysis, further conclusions can be derived from the divergence in implied vs. realized correlation of energy ETFs. Below, we look specifically at XLE 6-month implied vs. realized correlation. During the energy sell-off this summer, XLE implied correlation was elevated relative to realized, as investors looked to broader indices to buy protection, rather than hedging individual names. As the selloff has reached a local bottom, investors are now looking at winners and losers with sustained lower oil prices. This is consistent with the implied correlation coming back in-line with realized, as implied volatility in individual stocks increases relative to that of the ETFs.



Concluding Thoughts

The oil price decline in 2008 was more severe than implied by option prices. However, evaluating the precision with which derivatives forecast the size of the crude decline in 2008 is challenging due to the global nature of the credit crisis. The most recent downturn in crude is more interesting to consider in light of the meaningful divergence between the energy market and the options market. As we have started to see in the deterioration of several E&P companies and other players in the energy space, this differential has had resounding implications for the price of equities. While it is difficult to “call the bottom”, option prices seem to imply we are not there yet, despite the bullish inflows seen into energy-related products. The major question remains: Will the options market or the bullish flow in energy triumph as 2015 plays out? We continue to think the spike in volatility in relation to this most recent plunge in oil is meaningful for the energy market.