



## Timing Indicators for Structural Positions in Crude Oil Futures Contracts

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*This digest article will argue that it is plausible that there are two fundamental metrics that could be useful for deciding upon crude oil futures positions: (1) whether there are ample inventories or not; and (2) whether spare capacity is at pinch-point levels or not. The article will further argue that a dynamic allocation strategy alone is not sufficient for holding the line against losses in a crude-oil-dominated strategy: financial asset diversification must also be employed.*

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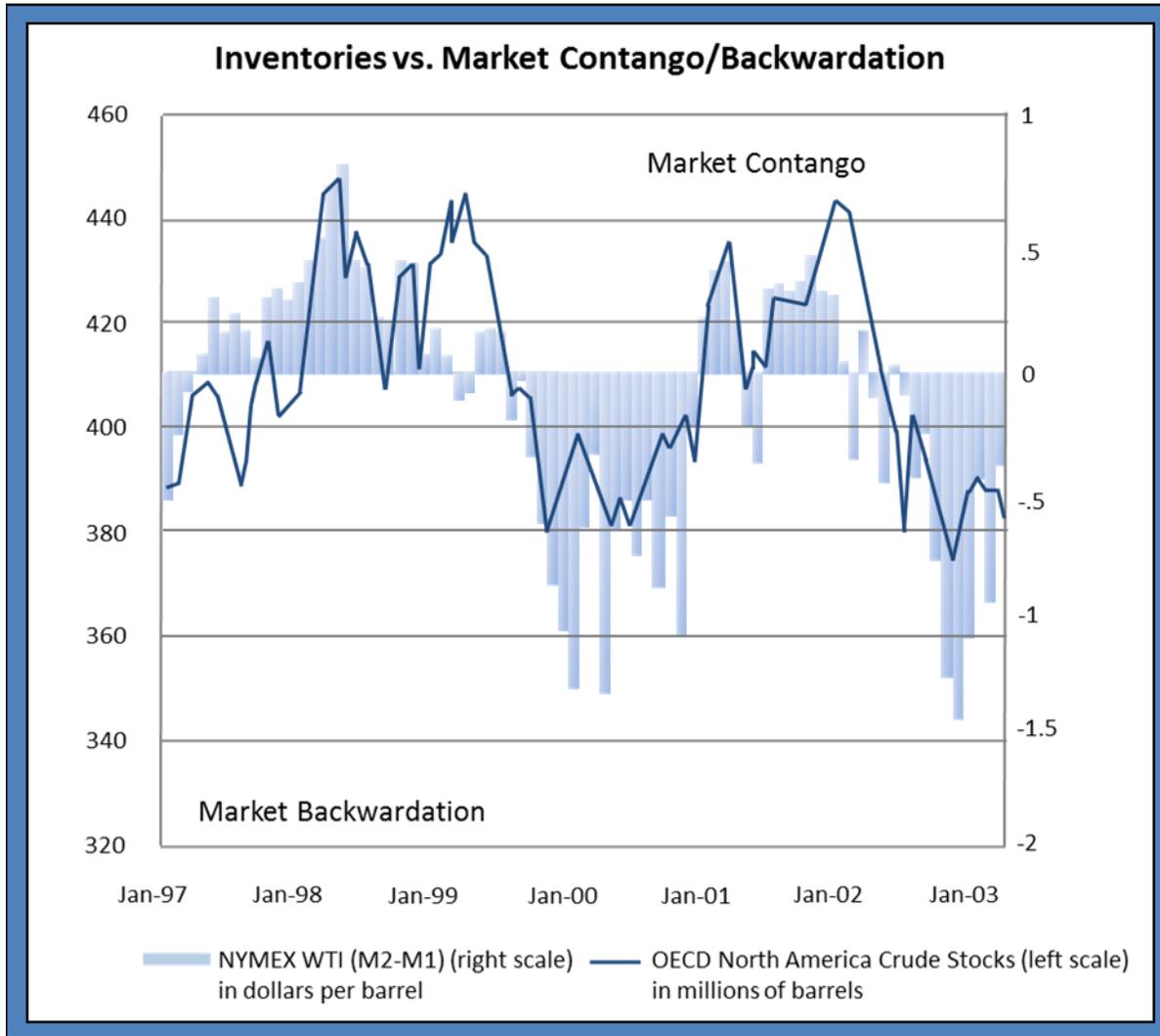
### Ample Inventories Can Potentially Be Proxied By Roll-Yield-Related Measures

A futures contract's roll yield is positive when the near-month futures contract trades at a premium to deferred-delivery contracts, forming a curve shape referred to as "backwardation." Conversely, the roll yield is negative when the near-month futures contract trades at a discount to deferred-delivery contracts, forming a curve shape referred to as "contango."

When crude inventories have been ample, the front-to-back futures spread has been in contango; and when inventories have been scarce, the front-to-back spread has been in backwardation. This is illustrated in Figure 1 on the next page. One should consider only taking long-term positions in oil when inventories are scarce, as indicated by the futures curve shape.



Figure 1



Graph based on Tchilinguirian (2003), Left-Hand-Side of Slide 18.

Explanation of Abbreviations: NYMEX = New York Mercantile Exchange; OECD = Organization for Economic Co-operation and Development; and M2- M1 = Second-Month Futures Contract Price Minus First-Month Futures Contract Price.

### The Avoidance of Crash Risk by Examining the Spare Capacity Situation

One could argue that there is a second fundamental metric that should be taken into consideration with oil positions, and that is the spare capacity situation for oil. To motivate why spare capacity might be quite important to the behavior of crude oil prices, one can review the circumstances of 2008. We found out from the events of that year what happens when the oil excess-capacity cushion becomes quite small. In July 2008, the role of the spot price of oil was arguably to find a level that would bring about sufficient demand destruction so as to increase spare capacity, after which the spot price of oil spectacularly dropped.



As discussed in Till (2016), in addition to OPEC spare capacity, one “may also [need to] include North American drilled, but uncompleted wells, as *de facto* spare capacity” as well.

It may be wise to exit a long-term position in oil futures contracts if there is an indication of low spare capacity (properly defined) in order to avoid the potential of an eventual crash risk. Further, for some market participants, it may also be advantageous to avoid crude oil futures exposure when there is minimal global oil spare capacity so that their trading strategy would not be viewed as “predatory,” as advocated by Joseph Eagleeye of Premia Research LLC.

**Return Comparison**

How would have returns from holding a structural position in Brent oil futures contracts changed if one only took positions in crude oil when (a) the crude futures curve was backwardated; *and* (b) there was sufficient spare capacity? The answer is that historically, negatively skewed returns became positively skewed. This return comparison is shown in Figure 2.

**Figure 2**

<b>Brent Futures (Excess) Returns</b>		
<b>February 1999 through January 2015</b>		
<b><u>Based on Monthly Data</u></b>		
	<b><u>Unconditional Monthly Returns</u></b>	<b>Conditional on Previous Month's OPEC Spare Capacity &gt; 1.8 mbd AND Brent Front-to-Back Spread &gt; 0 <u>Monthly Returns</u></b>
<b>Arithmetic Average:</b>	<b>1.2%</b>	<b>2.0%</b>
<b>Skew:</b>	<b>-0.18</b>	<b>0.12</b>
<b>Minimum:</b>	<b>-34%</b>	<b>-15%</b>

Source: Till (2015b), Figures 9 and 13.

Sources of Data: The Bloomberg and U.S. Energy Information Administration.

Explanation of Abbreviation: "mpd" stands for million barrels per day.

The strategy, conditional on both ample spare capacity *and* the Brent futures curve trading in backwardation, is positively skewed with its worst monthly return being -15%. In this case, one only held crude oil futures contracts 45% of the time, and the returns shown in the right-hand column of Figure 2 were only calculated when both conditions held.



A strategy of historically only entering into Brent futures contracts when (1) there had been sufficient spare capacity and (2) when there had been low inventories (as implied by the futures curve) has historically had appealing option-like characteristics. This dynamic allocation strategy has historically behaved as if it owned collars on crude oil. Collars are a combination option strategy of buying out-of-the-money puts financed by selling out-of-the-money calls. Across quartiles of Brent futures returns, the conditional strategy essentially gave up the possibility of very large returns in exchange for avoiding quite negative returns, as discussed in Till (2015a).

In examining the level of fees that hedge funds have been able to charge for moving the return distribution of an asset class to the right, one might conclude that investors highly prize positive skewness. Therefore, it is useful to examine a strategy's potential option-like characteristics such as was briefly done in this section.

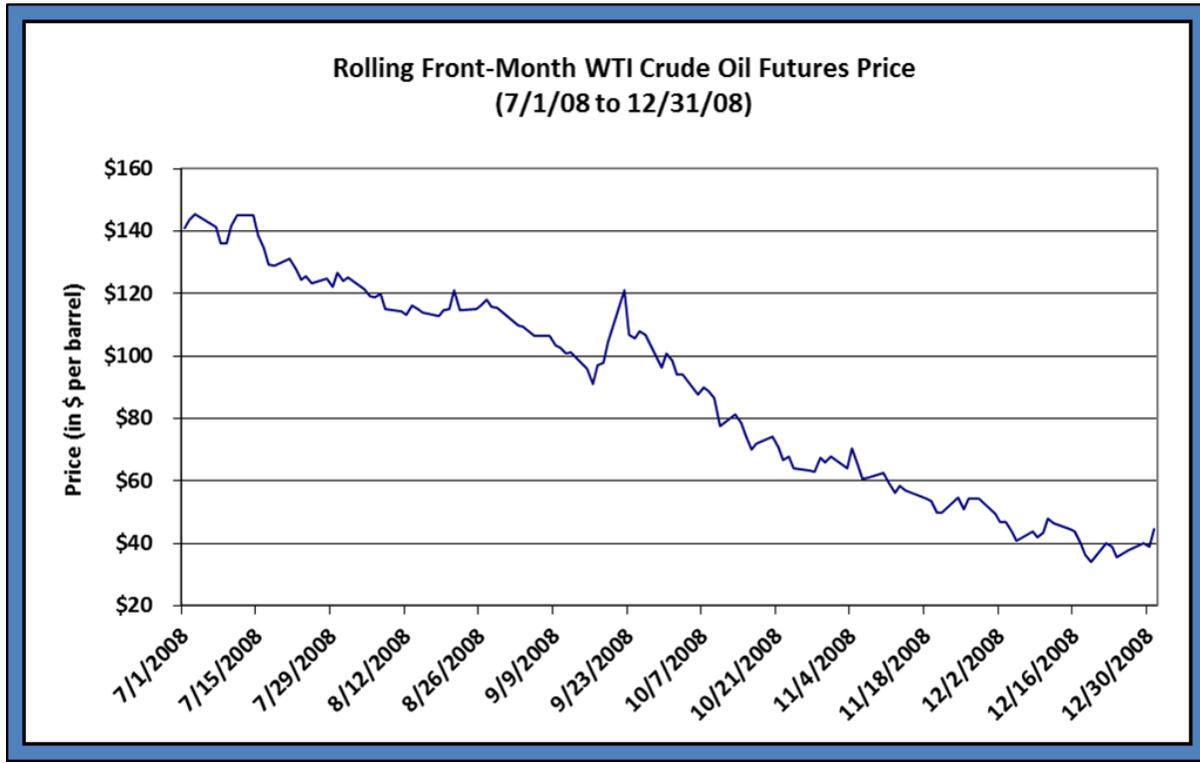
### **Financial Asset Diversification for Downside Hedging**

The use of timing indicators for deciding upon crude oil futures holdings may be necessary, but is probably not sufficient for this allocation decision. Based on historical data, it appears that one should also consider natural hedging strategies. As explained by Evans-Pritchard (2014), whom in turn cited data from HSBC: "Tumbling oil prices ... have been a bonanza for global stock markets, provided the chief cause has been a surge in crude supply rather than a collapse in economic demand." In this scenario, an equity hedge would serve as an appropriate hedge for petroleum complex holdings. That said, declining oil prices have not always preceded equity-market rallies. If oil prices are undergoing a dramatic decline because of "the forces of global recession," this can overwhelm "the stimulus or 'tax cut' effect for consumers and non-oil companies of lower energy costs," summarized Evans-Pritchard (2014). Under that scenario, a Treasury hedge may be the most effective hedge for petroleum complex holdings.

For example, during the collapse of oil prices during the Great Recession and Global Financial Crisis of the latter half of 2008, Treasuries performed quite well. Please see Figure 3 on the next page.



**Figure 3**  
**Crude Oil Prices and Treasury Note Futures Returns During 2H08**



Source of Data: The Bloomberg.

**10-Year U.S. Treasury Note Futures Excess Returns:  
 Under 2H2008 Scenario  
 13.8%**

[Calculated based on rolling the futures contract on the first business day of the first-notice-day month.]

Source of Data: Commodity Research Bureau.

Calculations based on work by Joseph Eagleeye of Premia Research LLC.

If one accepts this article’s arguments, then what should be the precise mix of oil-dominated commodity positions, equities, and bonds? In practice, this depends on an investor’s (a) return expectations, (b) loss aversion, and (c) tolerance to periodically underperforming one’s peer group. For example, in practice, institutional investors are averse to underperforming their peer groups over three-to-five year timeframes, and this consideration has historically (apparently) dominated maximizing long-term returns. If this is the case for a particular investor, then this fact may need to be taken into consideration in determining an investor’s precise asset allocation mix, including oil.



## Conclusion

In addition to examining whether crude oil has ample inventories, which can be inferred from the crude oil's curve shape, a trader or investor might find it advisable to also examine the spare capacity situation for crude oil. But for long-term position-taking in oil futures contracts, even these timing indicators may not be sufficient for holding the line against losses, especially during a deflationary shock. In that case, it may be that prudent portfolio construction is also necessary.

*GCARD* readers whom are interested in a more in-depth discussion on timing indicators for structural position-taking in crude oil futures contracts are encouraged to review the longer essay in Till (2015b).

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## Keywords

Crude oil futures, spare capacity, structural positions, futures contracts, contango, backwardation, asset allocation