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Crude oil futures markets: Does NYMEX trade and the de-linking of WTI and Brent affect ICE trade?

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Crude oil futures markets

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Introduction

- This paper examines the relations between the crude-oil futures trading activities on the New York Mercantile Exchange (NYMEX) (now part of the Chicago Mercantile Exchange (CME) Group) and the Intercontinental Exchange (ICE; of London) exchanges, placed in the context of the apparent de-linking of WTI and Brent.
- The paper analyses the activities of NYMEX crude oil traders according to their open interest positions as reported in both the Legacy Commitment of Trader (LCOT) reports and the new Disaggregated COT (DCOT).
- The paper also analyzes the trading patterns of ICE-Brent traders, albeit for a much shorter time period.
- In addition, it addresses some questions regarding suggestions of “excessive” trading in crude oil futures contracts.



Motivation

- The motivation for this paper is to extend the literature analysing the relations between derivatives market traders and prices and to extend the understanding of the relations among the traders.
- A secondary motivation is to enhance the understanding of what the publically available data on trader activity may be able to reveal about these activities, and to some extent to identify the limitations and what they cannot say.
- The desire is that this will improve the understanding of the information upon which regulatory proposals are based.



Literature

- Haigh, M. S., Hranaiova, J., and Overdahl, J. (2005)
- Cooper, M. (2006)
- Ripple, R.D. (2008a; June)
- CFTC (2008; September)
- Ripple, R.D. (2008b)



Methodology

- For the most part, these preliminary analyses are conducted through graphical and tabular analyses.
- Some correlation analyses are undertaken, and since these are done on changes in variables there should be little concern with unit roots and spurious correlation; however, this aspect of the analyses nonetheless will be formally evaluated in future research.



Data

- The paper examines crude oil prices, futures contract open interest, and futures contract trading volume.
- The primary price data employed are spot prices for West Texas Intermediate (WTI) and Brent crude oil. These are drawn from the EIA webpage. Spot prices are employed in this preliminary analysis because the differences in trading days between the two exchanges makes matching futures settlement prices difficult; this will be worked on in the future.
- Futures contract open interest and trading volume data are drawn from the CRB Database for the NYMEX contract and from the ICE online database for the ICE-Brent contract.
- Open interest by trader category is drawn from the CFTC for the NYMEX contract (both LCOT and DCOT data) and from the ICE online database for the ICE-Brent contract (equivalent to DCOT).
- Some series date back to January 2000, while others date to January 2002. The ICE-Brent trader category open interest dates only to January 2011. All series come forward to June 2012.

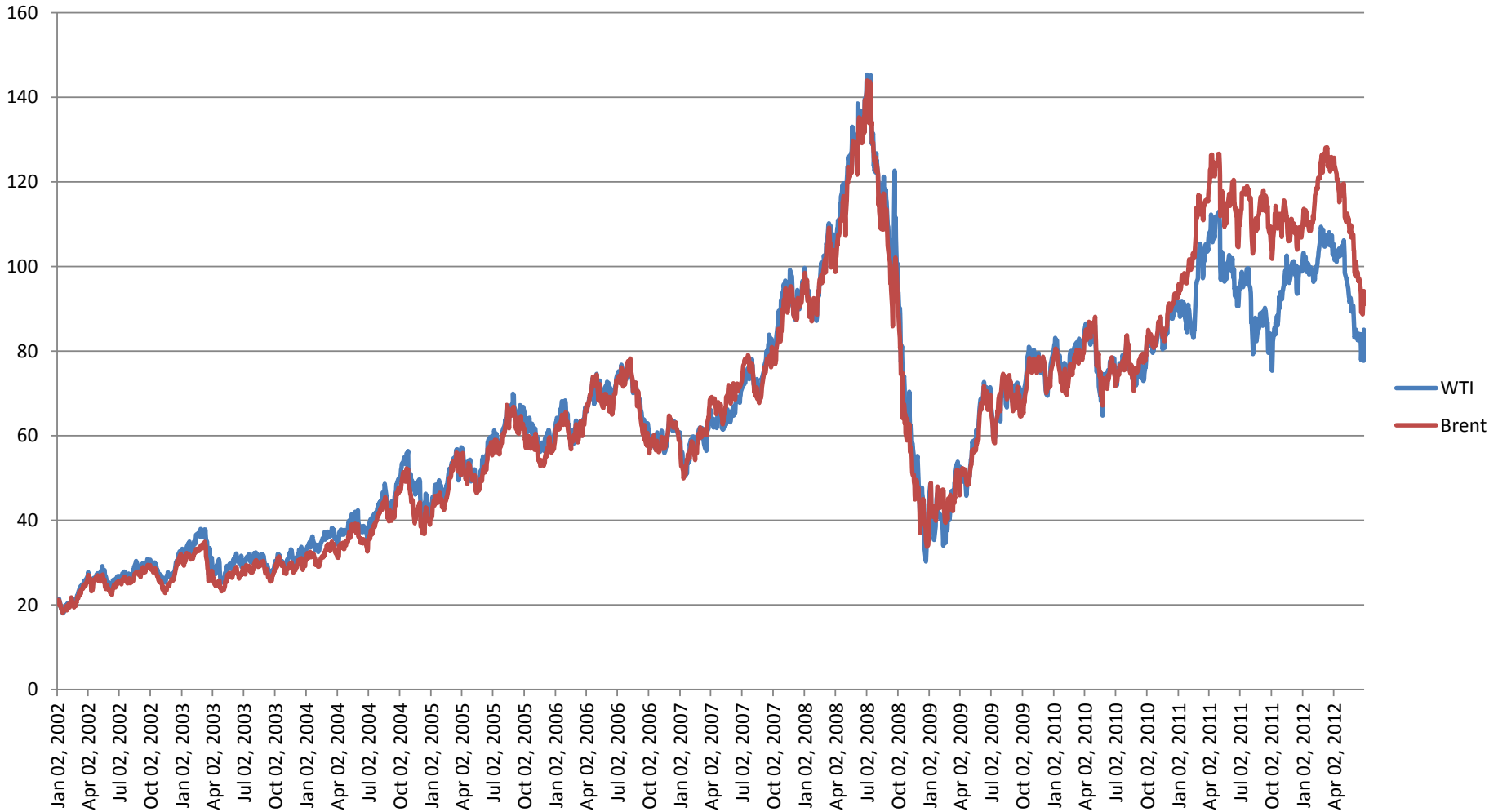


The *de-linking* of WTI and Brent

- The de-linking appears to have taken force on or after 28 October 2010.
- Prior to this, while WTI typically traded at a premium to Brent, the price series can be seen to have crossed numerous times over the ten-year period.
- Since 28 October 2010, Brent has continually held a premium position with respect to WTI, but that premium has not been stable.



WTI and Brent spot prices
Daily: 2 Jan 2002 - 30 Jun 2012
(source: EIA; US\$ per barrel)

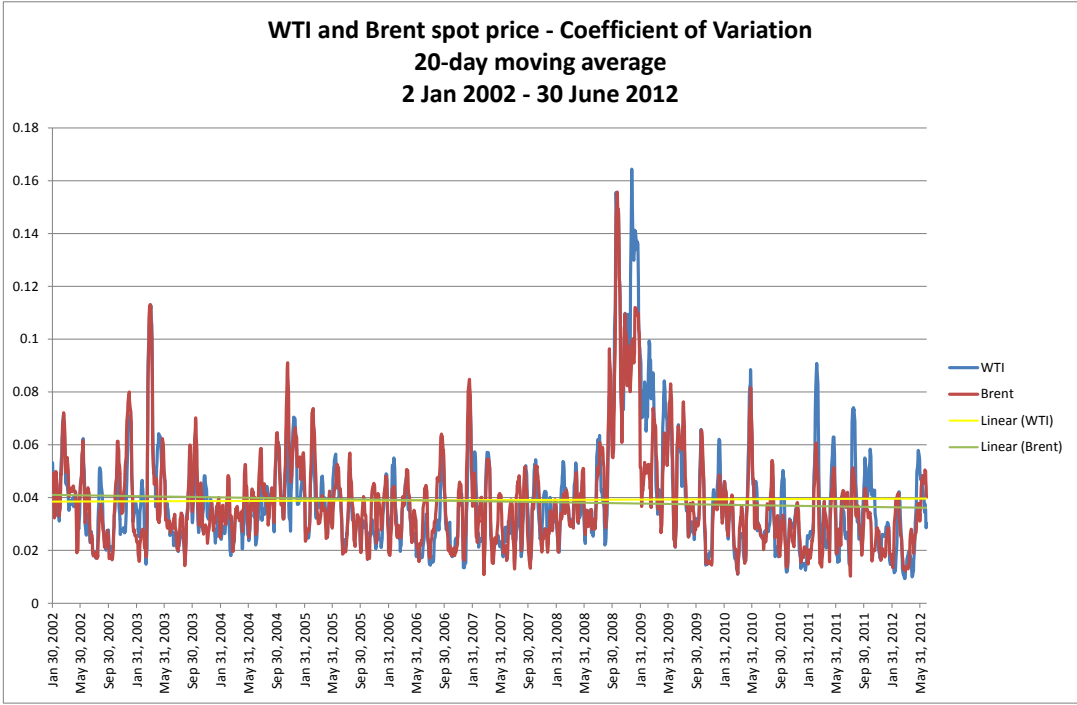
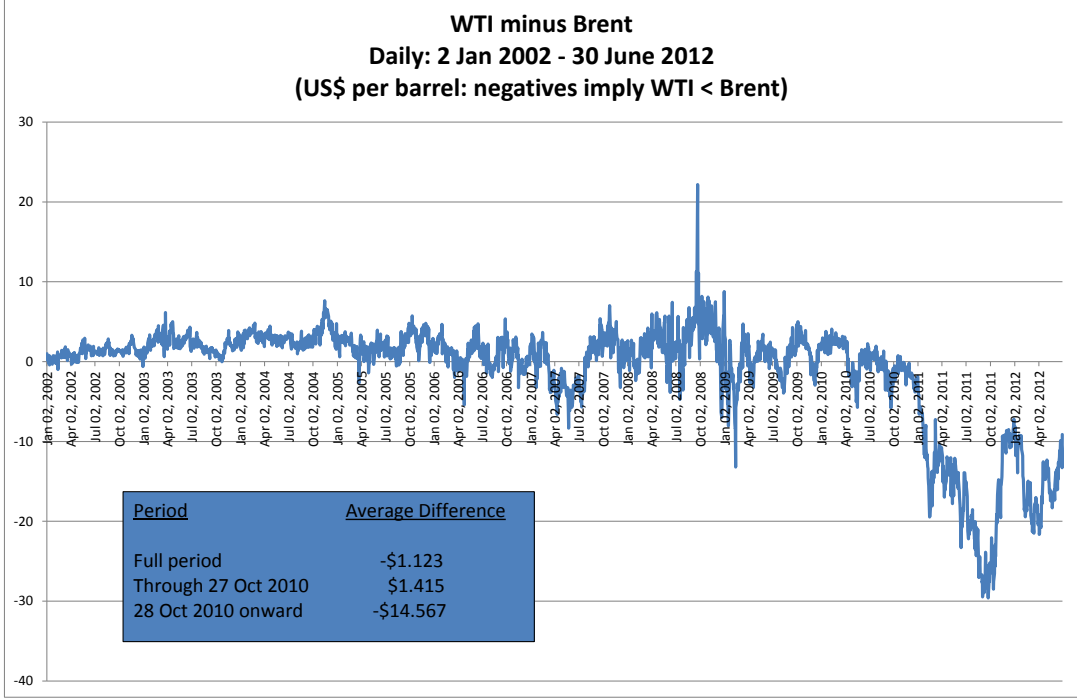


Spot price characteristics

- The prices for the two crude oils have actually reversed premium (discount) status reasonably frequently until 28 October 2010.
- With the exception of the mid-2008 period, the volatility for each price series appears relatively consistent.



Some apparent cyclicality in the premium/discount status beginning as early mid-2005.



Price volatility has been relatively flat for each series with the exception of the 2008 period. And, Brent volatility appears to have “peaked” prior to that for WTI in the 2008 period.



Futures contract open interest

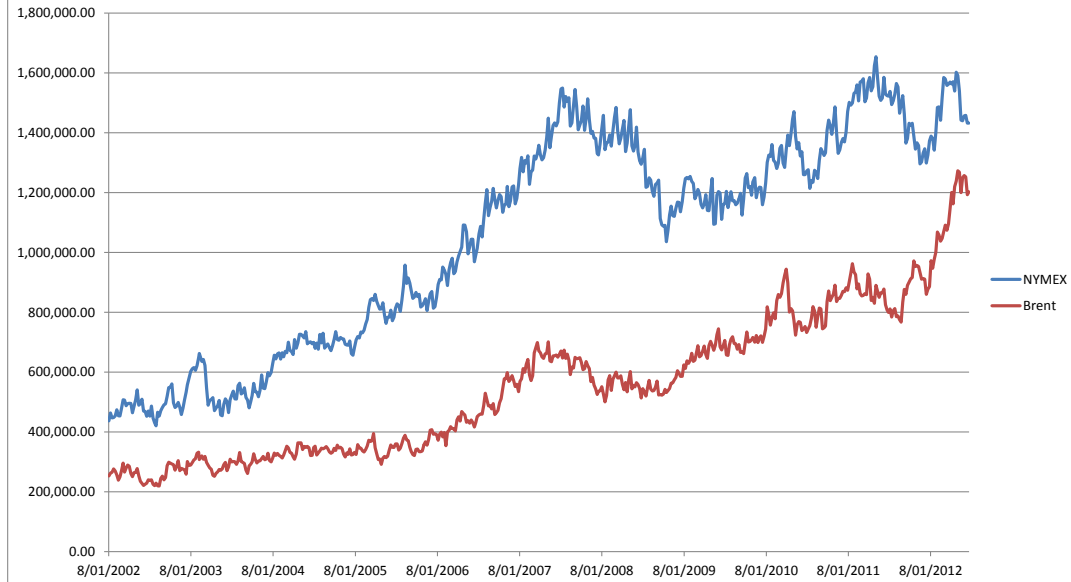
- What is open interest?
 - It is the number of contracts at the end of the day that are still open for trading when the market reopens.
 - There is no comparable measure in equities, since, unlike shares outstanding, open interest varies over the life of a contract.
 - It is typically seen to provide a measure of market depth or liquidity.
 - Importantly, there is no one-to-one relation between open interest and trading volume; they each provide different information regarding trading activity.



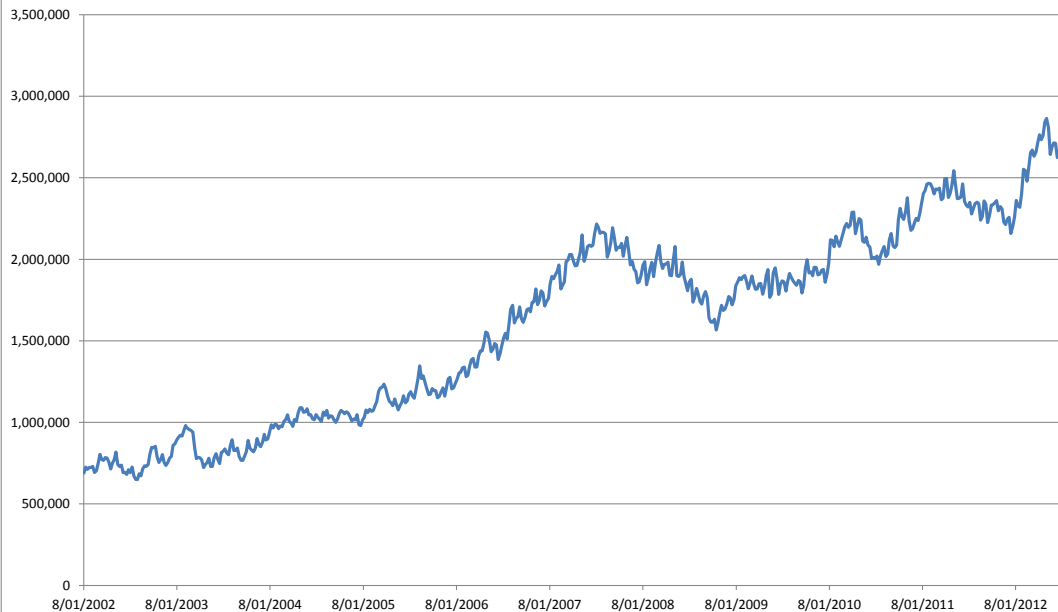
The generally increasing open interest in each contract seems to be influenced by both macroeconomic trends and a sense of the riskiness of the market.

Even as Brent trading volume exceeds that for the NYMEX contract, Brent's open interest remains smaller.

Total Open Interest positions: Tuesdays
NYMEX-Brent crude oil contracts
Jan 2002 - June 2012



Combined Open Interest
NYMEX and Brent-ICE



We will see later that the significant drop in open interest was due primarily to commercial/hedger traders and not attributable to so-called speculators, as is typically claimed.



CFTC Open Interest by Trader Category

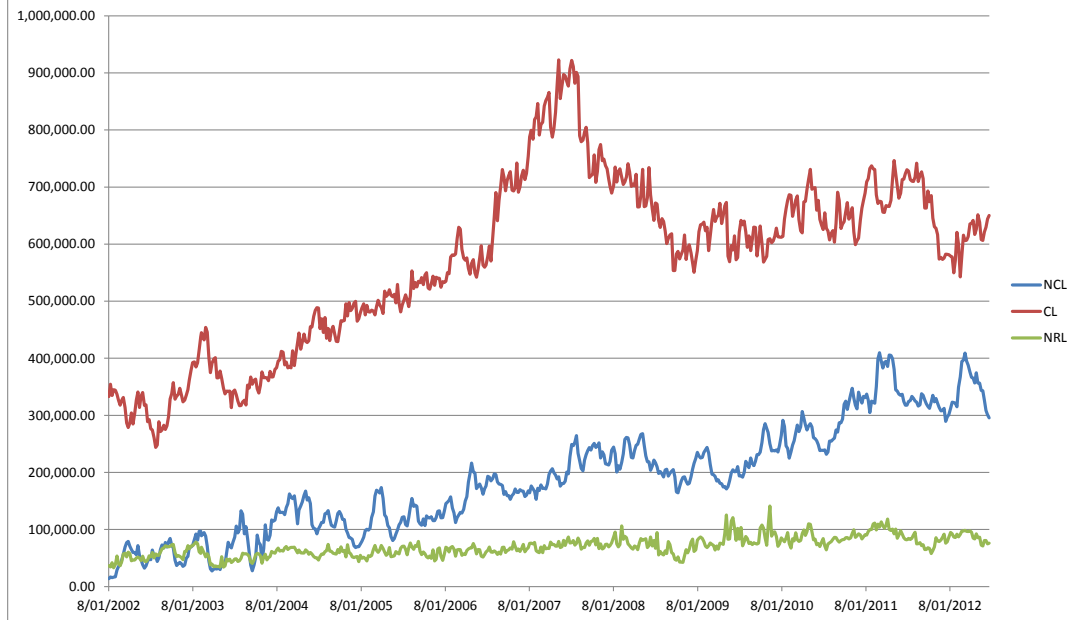
- The CFTC reports open interest positions by trader category:
 - The Legacy Commitment of Trader (LCOT) data
 - Commercial
 - Non-commercial
 - Non-reporting
 - The Disaggregated Commitment of Trader (DCOT) data (available only from June 2006)
 - Producers/Merchants
 - Swap Dealers
 - Money Managers (this is where hedge funds are counted)
 - Other Reporting
 - Non-reporting



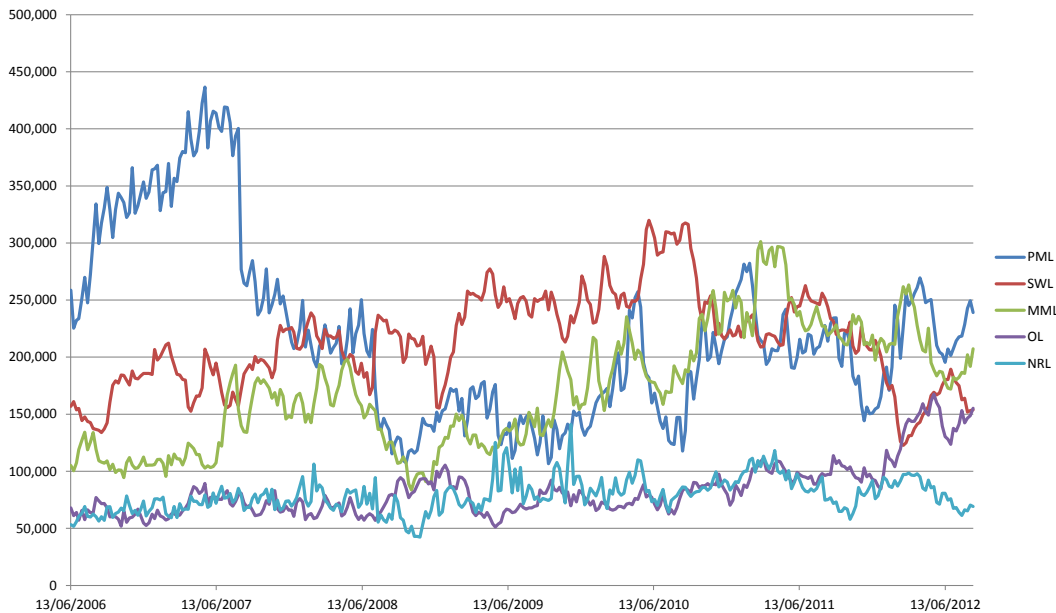
Commercials equal the sum of Producers/Merchants and Swap Dealers. Non-commercials equal the sum of Money Managers and Other Reporters. Non-reporters have open positions less than 350 contracts.

The plunge in 2008 is dominated by the Producers/Merchants.

**NYMEX Traders Long Positions
Jan 2002 - June 2012**



**NYMEX Trader Long Positions
June 2006 - Aug 2012**



I am showing long positions only. Each trader category is also well represented on the short side of trading activity, but it seems to be the longs that draw the most attention.

It is clear that the Commercials dominate the market.

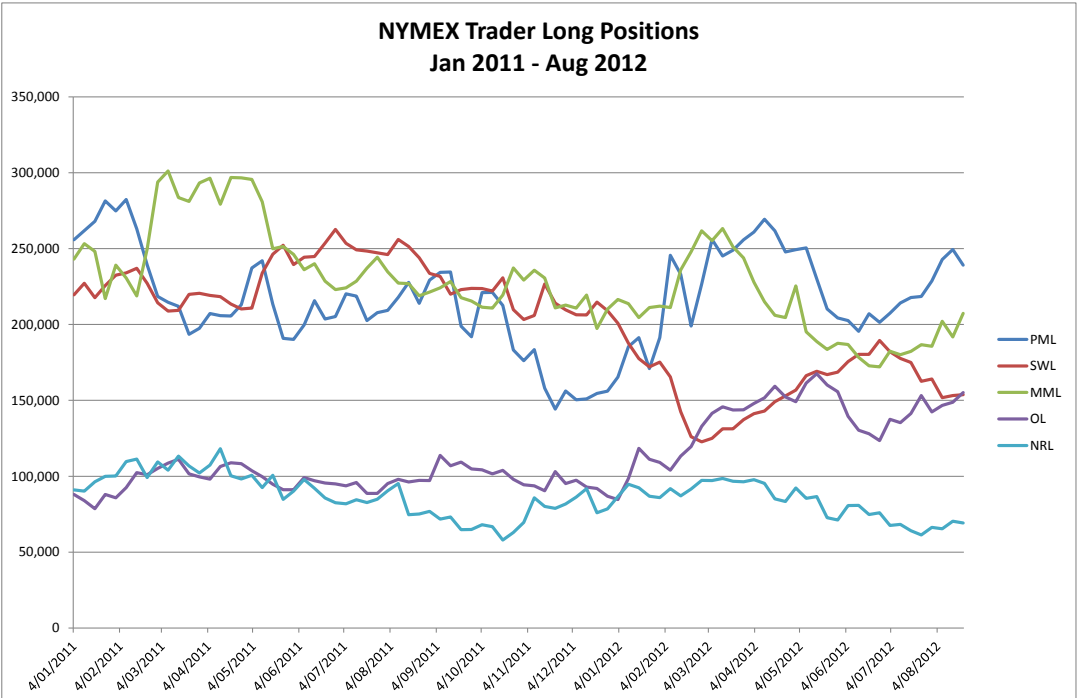
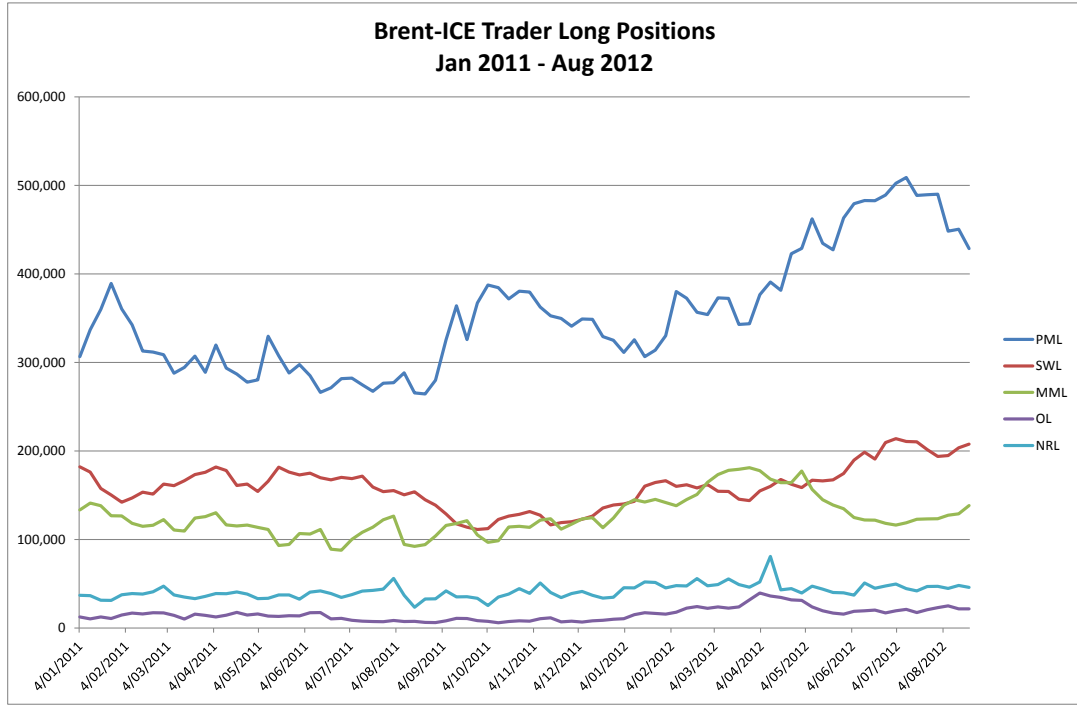


ICE and NYMEX

- The ICE only began to make available open interest positions by trader category from January 2011, which are comparable to those released by the CFTC.
- This does not allow for a comparison of trader category activity before and after the apparent de-linking, but we may compare the trading patterns on the two exchanges.



There is a much clearer pattern of relative trader activity on the ICE with Producers/Merchants dominating. However, the combined Commercial traders clearly dominate both exchanges during this period following the price de-linking.



In the March through May period Money Managers enter the NYMEX market long at the same time Producers/Merchants are leaving. Short positions for Producers/Merchants did not change much, so MMs were providing hedging support.

Open Interest and De-linked Price

- One would expect that the apparent de-linking of the prices would have a discernible effect on the trading activity of the two markets.
- One way to examine this is to look to the correlation between the changes in the price differential and changes in the open interest on each exchange. We may expect that an increasing premium for Brent over WTI would have a significant positive correlation with ICE-Brent open interest changes and a significant negative correlation with NYMEX open interest changes.
- Also, the correlation between the changes in open interest on each exchange may provide some insights; for example if the NYMEX contract is de-linked from the rest of the world, we may expect to see trading activity leaving the NYMEX and transferring to the ICE. Hence, we would expect a significant negative correlation.



Open Interest and De-linked Price

- Using Tuesday observations on spot price changes and open interest position changes:
- I find that the correlation between price differential changes and NYMEX open interest changes to be -0.11 , and for ICE-Brent open interest it is -0.08 . Neither suggests a strong influence, and the sign for Brent is not as expected.
- I find the correlation between changes in NYMEX open interest and the ICE-Brent open interest to equal 0.32 . Again, not a strong influence, and not the expected sign.
- It is also interesting to note that after the de-linking of prices, the correlation between the changes in the two prices actually increased. For the period before 28 Oct 2010, the correlation between price changes was 0.59 , but after that date it was 0.66 .



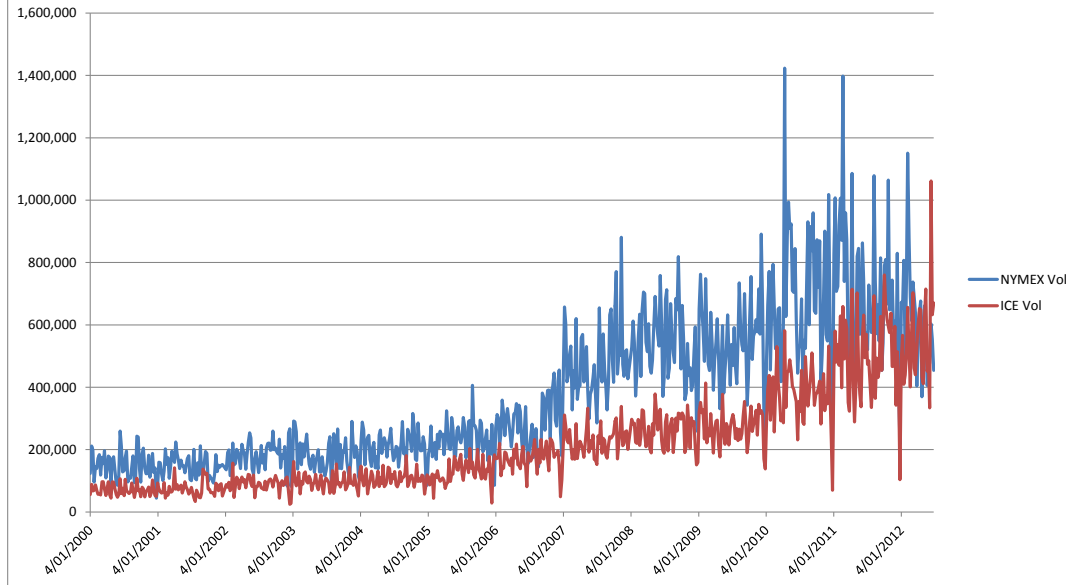
Crude oil trading volume on the NYMEX and the ICE

- Recently, the financial media have made a big deal about ICE Brent gaining trading-volume superiority over the NYMEX-light sweet contract; some suggesting it is a first.
- As noted earlier, the recent (and even earlier) ICE-Brent contract trading volume has exceeded that of the NYMEX contract even while having lower open interest; what does this have to say about relative “excessive” trading between the two exchanges?

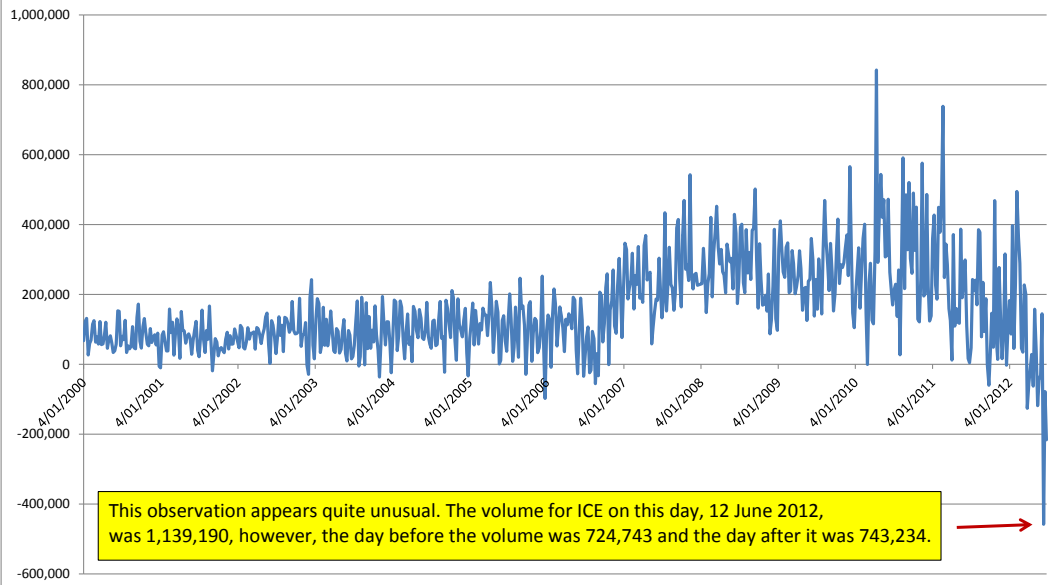


Crude oil trading volume, at least as observed on Tuesdays, tends to be somewhat volatile on both exchanges. However, it does appear that the NYMEX volatility began to increase sooner at about the time its volume surged in early 2007. ICE appears to have taken nearly five years to close the gap.

NYMEX Light Sweet and ICE Brent
Tuesday Total Trading Volume
Jan 2000 - June 2012



Trading Volume Difference: NYMEX minus ICE
Tuesday Observations
Jan 2000 - June 2012



The *newness* of the ICE-Brent trading volume exceeding that of the NYMEX contract would appear to be new only to those who did not observe the market prior to 2007.



What is *excessive* trading?

- I am not aware of any theoretically based definition for excessive trading.
- We typically think that more trading is a good thing, since this tends to assist with well-founded price determination. So what determines when we have *too much of a good thing*?
- How may one then at least try to determine whether or not crude oil futures trading activity has changed or fluctuated in market-disruptive ways?



Measures of trading activity (1)

- It is frequently asserted that the notional volume of crude oil traded via futures contract trade vastly exceeds the physical volume of crude oil consumed.
- One such example is Cooper (2006), where in the context of natural gas it is claimed that futures trade amounted to as much as 30 times the physical usage.
- For crude oil, the multiple is frequently stated to exceed 15 or 20 times, while even the NYMEX has claimed its trade to exceed global physical volumes by a factor of three.
- None of these is correct.
- In my June, 2008 *Oil and Gas Journal* article I demonstrate that futures trade represents a fraction of the physical when its volumes are placed on an equal footing (apples-to-apples) with the physical typically used for comparison, i.e., daily usage.



Measures of trading activity (1) – cont.

- The primary problem is that the bases for futures volumes and physical volumes have not been equalized. The physical is stated in terms of barrels per day, but the futures volumes used reflect traded barrels for **all open contracts**, which for the NYMEX contract is currently through December 2020. It makes no economic sense (or any other kind I can think of) to compare over seven years worth of traded volume to a single days consumption.
- When we make the appropriate adjustment, we find that on average over the period for the NYMEX contract trading volume amounts to 34% of physical, while the ICE-Brent contract trade amounted to 16% of physical trade, using 18 million barrels per day for the physical usage.



Measures of trading activity (2)

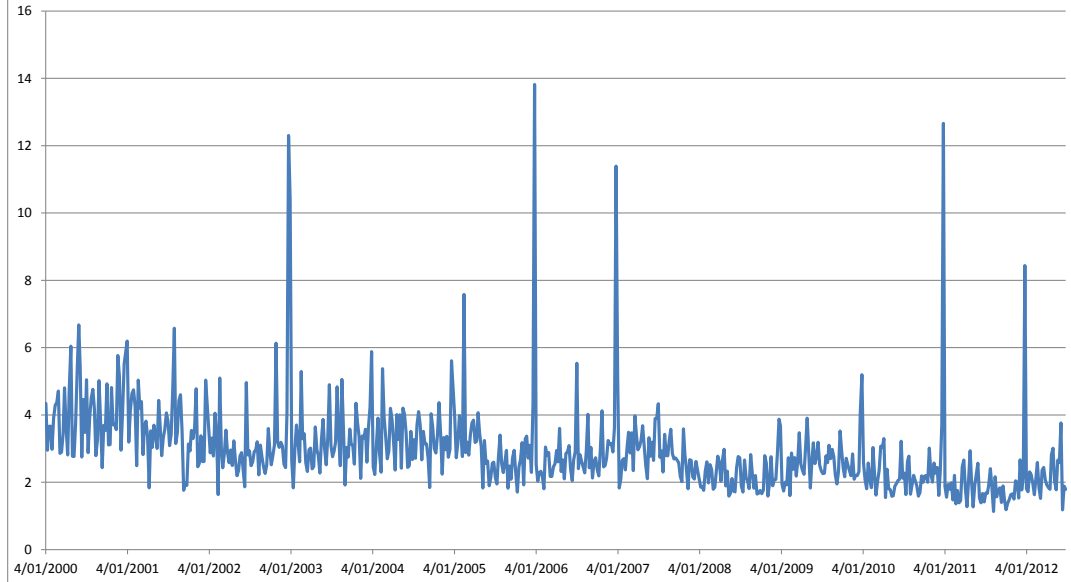
- Trading volume should not be examined in a vacuum; this may work for equities, but that is because shares outstanding is relatively static.
- Open interest evolves over the life of a contract, and it has evolved over time.
- Trading volume should be assessed relative to open interest.
- If speculators in the futures market rush in on a daily basis trading in ways that move the market, but leave by the end of the day (much like day traders in equities), we would observe spikes in trading volume relative to open interest.
- Open interest is only assessed at the end of the day, so a trader may enter and leave the market and have not influence on the open interest positions, while definitely having an observable impact on trading volume.
- Thus, a measure of daily open interest divided by daily trading volume should provide information regarding trends in trading and unusual shifts and changes in trading activity.



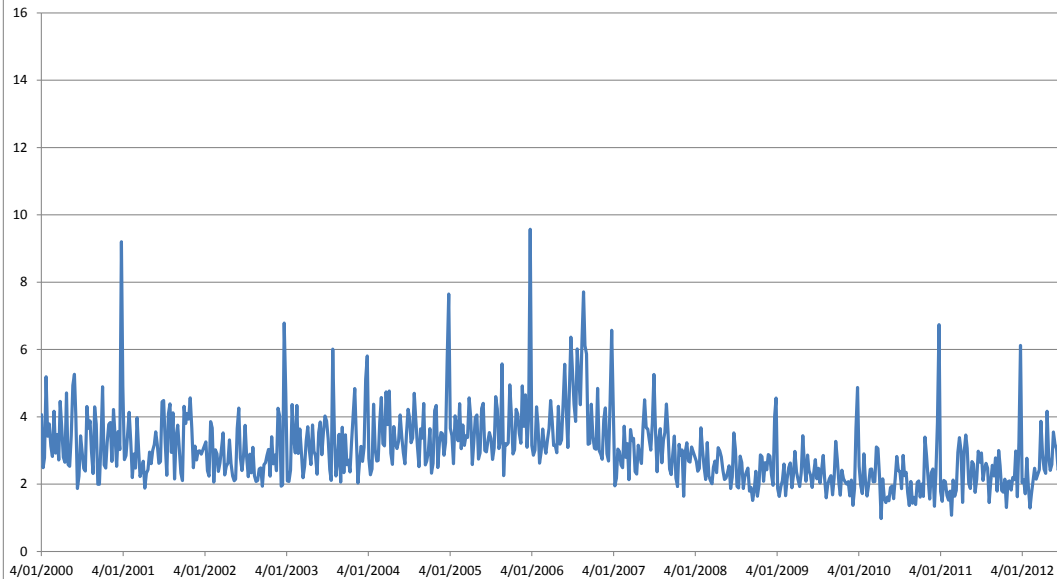
The big upward spikes reflect holidays.

The downward trend for both exchanges implies that there is more trading per open contract, but recall that trading volume is less than physical usage.

Brent-ICE Open Interest divided by Trading Volume
Tuesday observations
Jan 2000 - June 2012



NYMEX light sweet Open Interest divided by Trading Volume
Tuesday observations
Jan 2000 - June 2012



We are not able to say anything about who is doing the trading.

The Haigh, et al. (2008) paper showed that Non-commercials tended to hold their positions longer than did the Commercials, but the available data does not allow such a determination here.



Conclusions and Discussion

- The apparent de-linking of WTI and Brent does not appear to have had discernible impacts on the relative trading activity between the two contracts. It also does not appear to have played a significant role in how the different trader categories have traded through the period. What changes have occurred will have to be explained by other drivers, perhaps more related to general macroeconomic variables and the on-and-off economic recovery, and the disparity of the recovery in different parts of the world.
- The growth in open interest and trading volume may also reflect increased sophistication on the part of market participants and an increased comfort level with these risk mitigation instruments.
- The analyses have also shown that there is no evidence to support the frequent claims of excessive trading activity on the crude oil futures markets, whether it be within the US on the CME/NYMEX or on the ICE for the Brent contract.



Thank you!

Questions/Comments?

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