



Oil futures versus physical markets

How are they related?

Part 3: The effect of crack spreads



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1 Introduction

Everybody who is active in the oil industry knows that financial futures markets are linked to physical oil markets and that they determine to some extent the behavior of players in that market. But what is the logic behind these links, how do they exactly influence markets and most importantly, how can one anticipate on changes in market fundamentals? This is the mystery that we will try to unravel in this e-paper.

The explanation of this vast subject has been cut into three e-papers. One will cover the linkage between spot and futures prices, one will cover the effect of the forward curve on physical markets and the last e-paper will cover the effect of crack spreads on market players.

This e-paper focuses on the effect of crack spreads. We will start our investigation by determining what links are present and how this drives fundamentals. We will look at some examples which highlight the interplay between futures and physical markets. Based on this analysis we will discuss what a trader should monitor in order to get a broad view of the market structure and what is needed to be successful.

2 The effect of crack spreads

In the previous e-papers we looked at how oil futures markets of one and the same product influence physical markets. An important link between futures and physical markets is however related to the spread between two different oil futures contracts: the spread between crude oil and oil products. This is the so-called crack spread.

There are three important crack spreads in oil markets today:

- A. RBOB (gasoline) – WTI crack spread
- B. Heating oil – WTI crack spread
- C. Gas oil – Brent crude crack spread

“A” and “B” are spreads that are created by using futures of the NYMEX and are thus more US oriented. “C” uses futures of the ICE and it is more applicable to Northwest Europe.

It is important to calculate crack spreads with prices that have similar dimensions, for instance in \$/ton or \$/barrel, otherwise the spread has no real meaning. Furthermore crack spreads are calculated using prices of futures contracts with similar expiration periods. Most of the time markets look at front month futures prices when referring to crack spreads.

Figure 1 displays the ICE gas oil minus Brent crude crack spread time-series. In the chart also the ICE gas oil and Brent flat prices are displayed and the correlation between both time series.

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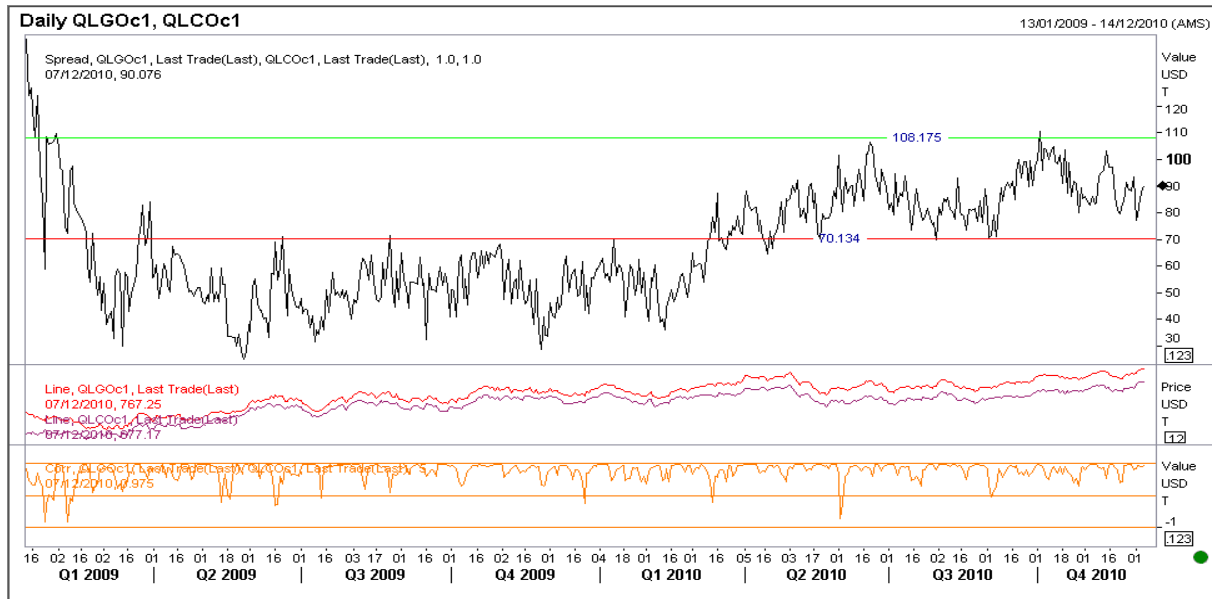


Figure 1: time series of ICE gas oil minus Brent crude crack spread, ICE gas oil and Brent flat prices, correlation between both time series.

The size of crack spreads influences the behavior of refiners in oil markets. Crack spreads can be interpreted as **gross profit margins** for oil refiners. It is the difference between sales and purchasing prices per unit of output.

Crack spreads thus have a direct link to profitability of refineries. If crack spreads are low then refinery profit margins are squeezed. This will result in an incentive to lower production of less economic refinery units. It may also result in rescheduling of maintenance activities. The economic loss of planned maintenance is lower in periods of low crack spreads because opportunity costs are lower. Both are short term effects and cause operational production capacity to lower. This can lead to shortages on spot markets and cause logistical problems.

On the medium to long term low crack spreads will influence the investment market in the refining business. Investment plans for additional refining capacity will be postponed or even scrapped. Also less efficient refineries might be divested or change ownership. This mechanism will eventually result in rising crack spreads till more economically sustainable levels are reached. In the meantime refining companies which suffer from low profit margins can become financially distressed and go bankrupt. For oil traders in such a way supply contract can be jeopardized.

3 The Big picture

Now that we know what links exist between futures and physical markets it is a good idea to summarize the insights so far. We have learned that:

- crack spreads influence the behavior of refinery companies
- low crack spreads can cause supply problems and jeopardize supply contracts

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Oil traders therefore need to monitor these indicators below because it gives a picture of market fundamentals:

- Crack spreads
 - RBOB (gasoline) – WTI crack spread
 - Heating oil – WTI crack spread
 - Gas oil – Brent crude crack spread

The key to success in oil markets is not only to monitor these indicators but to anticipate on changes and make plans for possible scenarios that can emerge. You can profit from resulting dynamics and beat the market before it beats you. The window of opportunity is short so: **Be prepared to take action!**

4 More information

Specifically for oil traders PJK has developed **market analysis reports** for the Northwest European oil products markets. We monitor and report on the highlighted indicators and the reports support scenario planning. Furthermore our advanced knowledge of market mechanisms complemented with our econometric experience can be utilized to your advantage by providing a platform to see how different scenarios influence oil markets. With this information **scenario planning** is improved drastically. Finally companies can profit from market dynamics instead of being a victim of it.

If you want to learn more about these subjects or wish to be supported with your daily oil market analysis or with market research then you can always contact PJK International. PJK has more than thirty years of experience in this field and has helped many companies with its knowledge. Contact details can be found in the header of this document.

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