

Gas And Oil, Together At Last

One of the cruel ironies of modern life is just how worthless crude oil is until it is refined. It is a small wonder how aboriginal people everywhere who stumbled upon naturally occurring oil seeps used the foul-smelling goo as a salve for insect bites and as a waterproofing material for wood, but for nothing more.

We have advanced to the point of extracting increasing quantities of ever more usable products from each barrel of crude oil via increasingly complex refineries. If you ever get an opportunity to visit a refinery, avail yourself of the opportunity. You will be amazed at two things: The sophistication of the operation and how the place does not detonate into a fireball every day. The first step in refining crude oil is heating it in a vacuum tower at about 900° Fahrenheit; do not try this yourself unless you really want that Darwin Award.

We looked at the structure of the European crude oil market last month (see “The Brent-WTI Spread,” October 2009). Let’s take a look at European refined products markets this month.

Gasoil Futures

The first successes in energy futures trading came with heating oil in the U.S.; at least one veteran of the energy industry in the late 1970s and early 1980s recalls constructing hedge ratios of almost anything that flowed and burned against these futures regardless of whether such trades made sense economically.

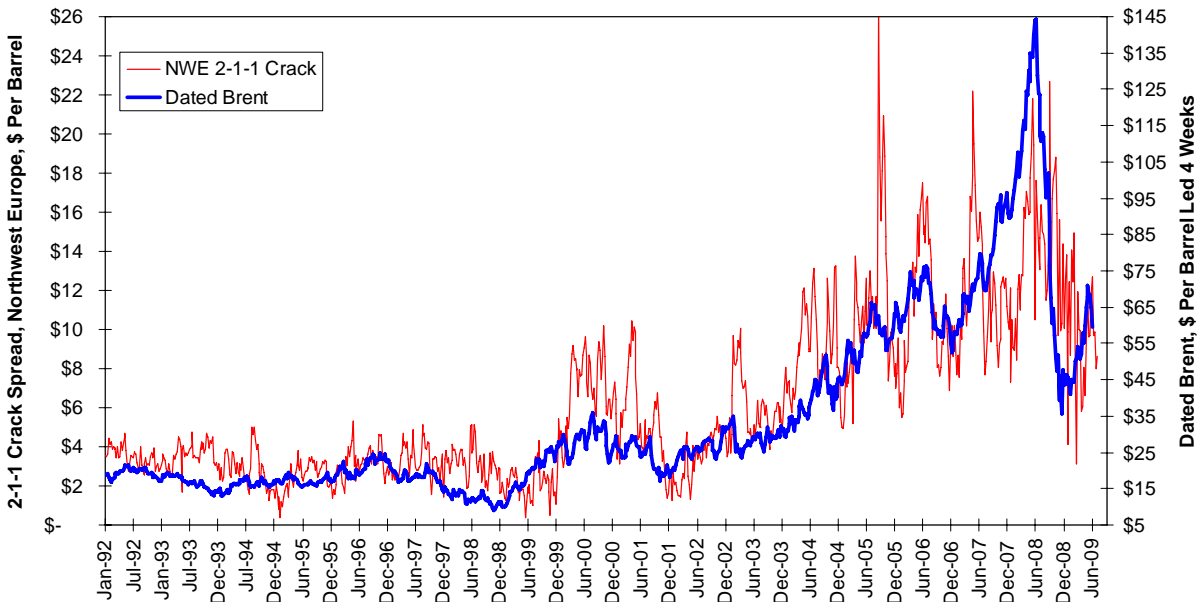
Heating oil in its various grades (the NYMEX contract is for the No. 2 grade) and diesel fuel both come from a cut of the barrel referred to as middle distillates. Gasoil, the basis of the Intercontinental Exchange’s contract in London, subsumes both heating oil and diesel fuel. It began trading in 1986, two years before Brent futures. Both heating oil and gasoil were suited well for the role of creating a futures complex; while crude oils are differentiated and many refined products such as gasoline and jet fuel have different grades, the middle distillates are relatively undifferentiated. In addition, they serve as both heating fuel and transportation fuel.

A second advantage middle distillates have is stability in both transportation and storage. They are less volatile than gasoline, and do not have gasoline’s light blending components such as butane or ethanol or its heavy detergent additives that tend to separate over time.

European Crack Spreads

One of the principal uses of gasoil futures is crack spread trading, playing the difference between refined products and crude oil. If we map the 2-1-1 crack spread (two barrels of crude oil into one each of gasoil and gasoline) of Dated Brent, the benchmark North Sea crude oil for loading in the next 10-21 days, at Northwest European refining locations against the price of Dated Brent itself, we see the 2-1-1 crack spread leads Dated Brent by four weeks on average.

Dated Brent Follows Refining Margins Closely



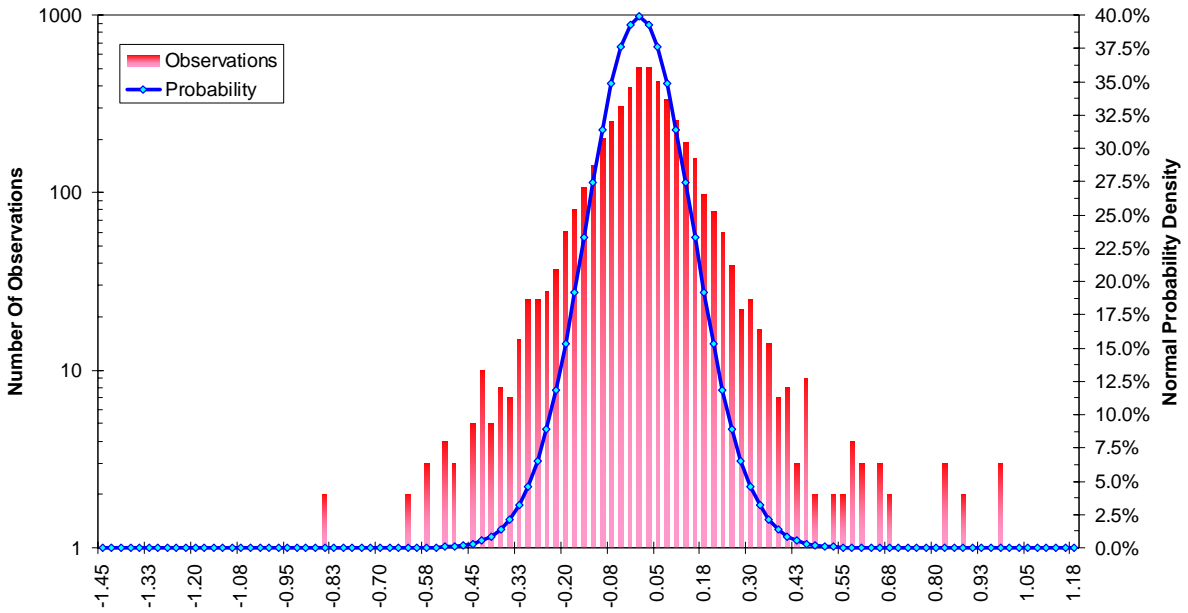
This closeness of fit is rarer than you might think in the world of refining. Economic logic might suggest the value of a barrel of crude oil, intrinsically worthless by itself, should be driven by its “netback” against a slate of refined products. This apparently simple theory simply falls apart in an active market with a large number of different types and complexities of refineries fed by different crude oils and operating through a mix of logistical infrastructures. Anyone who wishes to see where the price of Dated Brent is trending can and indeed should look to European crack spreads first.

Crack Spread Distribution

Refining capacity has been a scarce resource worldwide for much of the past decade. You may often here how there have been no new refineries built in the U.S. since the 1970s, and that is true for a good reason. A refinery is something like a city: You must build more than just new processing units; you have to build an entire infrastructure of pipelines, tanks, terminals, fuel sources, power supplies and both land- and water-based docking and terminal facilities.

This scarcity of capacity makes all crack spreads highly volatile. Any small change in production, any unexpected increase in demand for reasons such as cold weather, or any unexpected shock to supply for reasons such as a refinery fire can lead a spike in the spreads, and these spreads can collapse just as quickly as they rise. If we map the distribution of the 2-1-1 crack spread’s daily returns, we find the expected cluster of large positive values. As is typical for process spreads, which have a call option-like quality, the returns on this spread have a positive skew of 0.429.

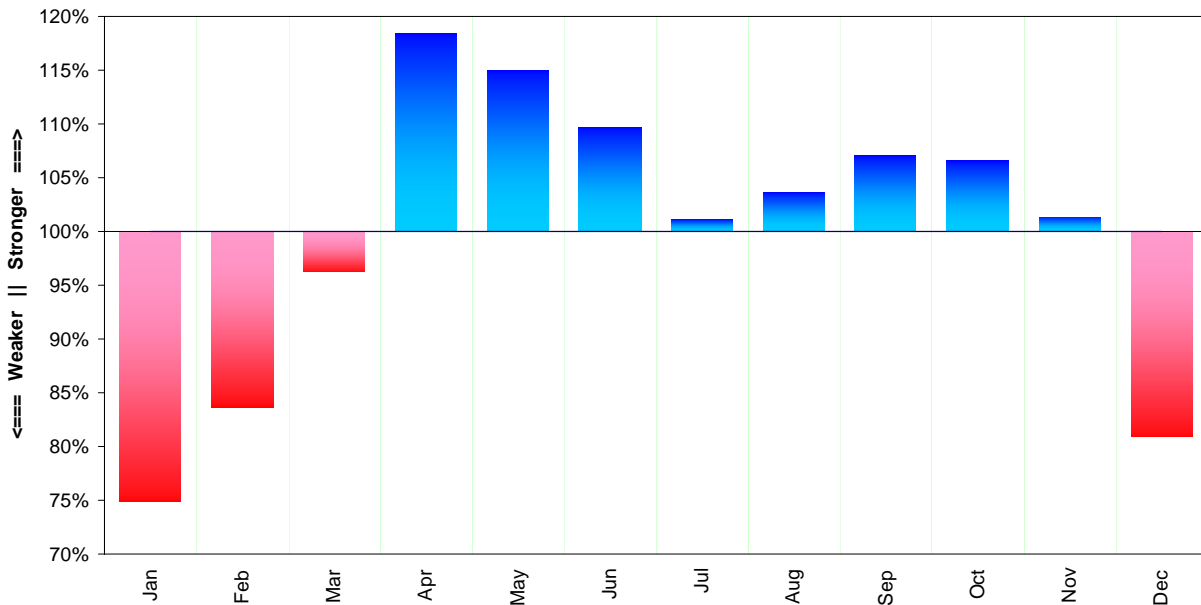
Distribution Of Daily Returns On Dated Brent 2-1-1 Crack Spread
January 1992 - July 2009



Crack Spread Seasonality

As demand for heating fuel is seasonal, we should expect the 2-1-1 crack spread to be seasonal in nature. It is; the spread is seasonally strong between April and November, inclusive, and weak during the winter months. We can attribute this seasonal shift to demand for gasoline in the summer months and to relatively lower gasoil output from European refineries during these months as well.

Seasonal Adjustment Divisors For 2-1-1 Dated Brent Crack, Northwest Europe

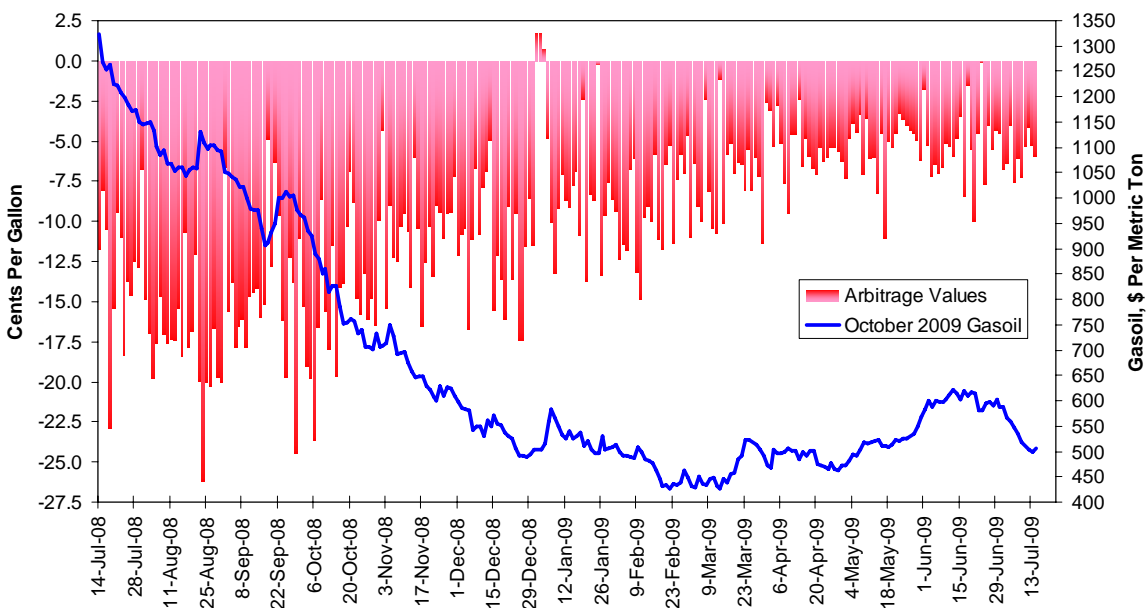


Gasoil Arbitrages

If you give traders an opportunity to spread related products, they will take it as a matter of course. The NYMEX heating oil contract settles at the end of the preceding month; the ICE gasoil contract settles in the middle of the month. This means a futures trader has to look at the flow going in the U.S. to Europe direction; a cash market trader can look at the backward flow from Europe to the U.S.

If we use the conversion of 7.45 barrels of gasoil per metric ton and 3.129 cents per gallon to dollars per metric ton, we can derive a spread between buying New York and selling London; the months used here are September 2009 for New York and October 2009 for London.

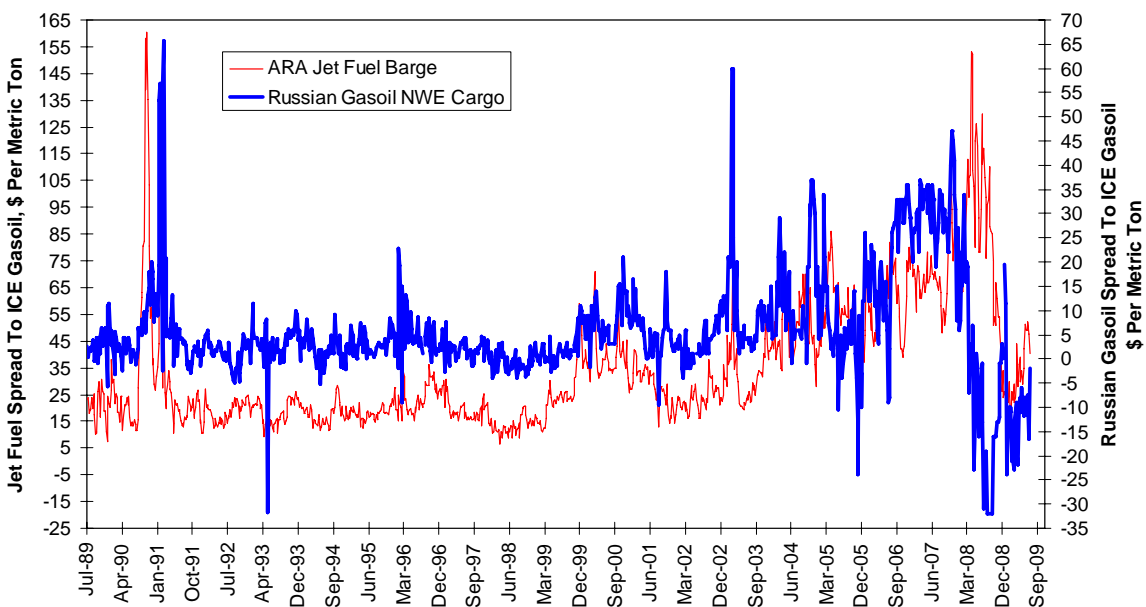
The October 2009 Heating Oil / Gasoil Arbitrage



The history of how this spread moved during the spectacular petroleum rally and collapse of 2008 indicates the New York leg was affected far more by what we can call speculative pressures than was the London leg. When gasoil prices rose in London, heating oil prices rose even more in New York and made the trade uneconomic. Once prices collapsed, the arbitrage narrowed but never really sustained positive values.

This is not to say London markets were unaffected by the speculative run-up. We can compare long-term spreads of Russian gasoil exports and Amsterdam-Rotterdam-Antwerp jet fuel (a heavier distillate) to gasoil futures. Please note how the spread of Russian gasoil collapsed in 2008; this gave exporters a strong incentive to ship gasoil out of the Baltic and into Northwest Europe.

Key Spreads Against ICE Gasoil Futures



Jet fuel prices spiked against gasoil, however, as jet fuel prices always do in a bull market. Please note similar spikes during both wars in Iraq; these occurred as the military commandeered jet fuel supplies away from commercial aviation. We can say the speculative surges in London distorted distillate markets throughout Europe just as the speculative surge in New York distorted the trans-Atlantic heating oil spread.

The price collapse in crude oil in late 2008 masked the simple and stark reality we had done nothing to address long-term supply problems in the petroleum markets. The long-term bull market began to reassert itself in the spring of 2009 as global economic growth rebounded slightly and demand grew well ahead of potential supply growth. Not only will all of the tradable petroleum markets become more active, but so will their spreads. A little bit of analysis today can lead to more profitable trading tomorrow.