

The Brent-WTI Spread

The refining industry could have adopted the motto, *e pluribus unum*, had it not been taken already. Which are the *pluribus* and which one is the *unum*, you ask? Each refined product of a given grade and specification is an *unum*, a singular and fungible product that can be used interchangeably by consumers worldwide. Even though refiners protest endlessly their gasoline is better than the competition's, those differences are a function of quality control at the refinery level and of additive packages from contract blenders.

The *pluribus* represents the wide range of crude oils refiners can process into those refined products. Crude oils come in a bewildering array of compositions characterized by their sulfur content, ("sour" for the 85% or so of the world's crude oils that are high-sulfur; "sweet" for low-sulfur), specific gravity, metallic impurities and content of various organic acids and waxes.

The Brent Market

Brent, which is both the crude from a field of that name in the U.K. sector of the North Sea and the shorthand for the BFOE (Brent-Forties-Oseberg-Ekofisk) family of crude oils, has served as a leading global benchmark for Atlantic Basin crude oils in general and sweet crude oil since production began in the 1970s. The 21-day BFOE index is used to compile the Brent Index on a daily basis and then used to cash-settle the Brent futures contract. While Brent is slightly less preferable to simple refineries than the U.S. futures benchmark of West Texas Intermediate (WTI), the two are considered substitutes.

In military parlance, terrain determines tactics. The same is true in physical commodity trading. WTI is a mid-continent pipeline market based in scenic Cushing, Oklahoma. The crude oil is priced in the futures market for ratable delivery over the month. Brent is a waterborne cargo market; when cargoes of Brent-basis crude oils arrive at the U.S. Gulf Coast (USGC), they are priced on a variety of bases, the most common of which is against a formula of related spot crude oils and refined products over a window around the bill of lading date.

Brent-basis cargoes and related crude oils at the USGC can travel northward up pipelines to Cushing, but the opposite is not the case; pipeline flows are not reversed southward to the USGC. What can occur is shipment of WTI from Midland, Texas, to the USGC.

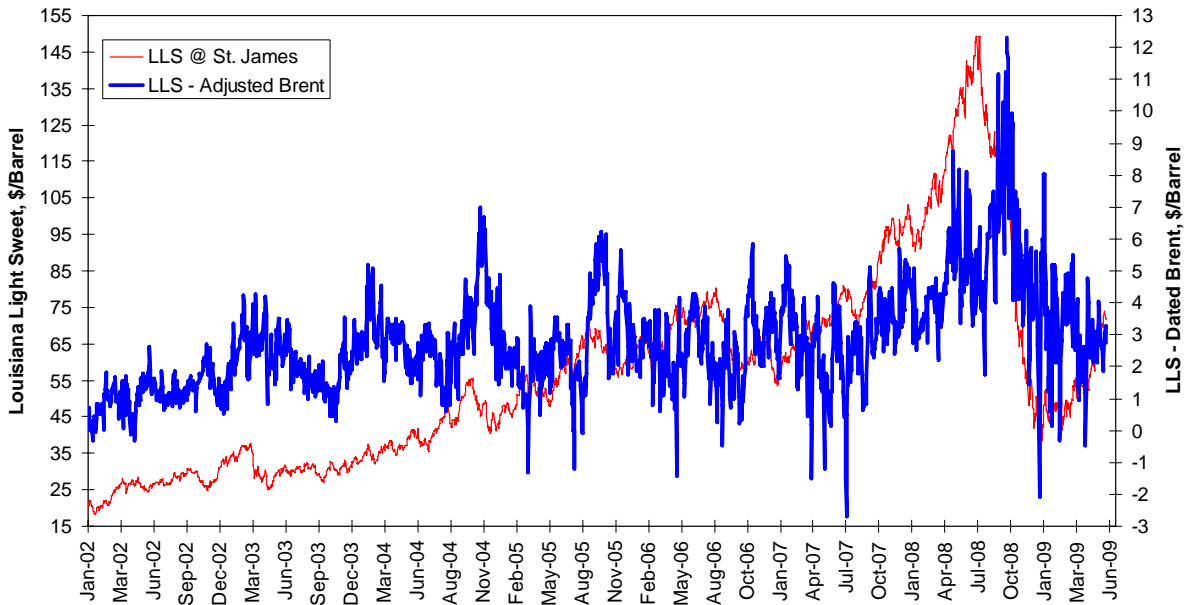
A third factoid enters into the equation, and that is time. Financial traders are spoiled by instantaneous arbitrage; physical traders are precluded from such teletransport of their wares. It takes almost two weeks for a cargo to cross the Atlantic, during which time its price should either "ride up" the forward curve in the case of a backwardated market or "ride down" the forward curve in the case of a contango market. Accordingly, the price of Dated Brent, the short-dated forward market used to price Brent-basis cargoes, should be adjusted by one-half of the spread between first- and second-month Brent futures to afford a proper comparison to the USGC.

The Brent-WTI Spread

The combination of these factors should lead traders to focus not on the spread between Brent and WTI futures, but rather on the spread between Brent adjusted for voyage time and a sweet crude such as Louisiana Light Sweet (LLS) at the USGC. As an aside, the spread is referred to commonly as "the Brent-WTI" spread even though its value is WTI minus Brent.

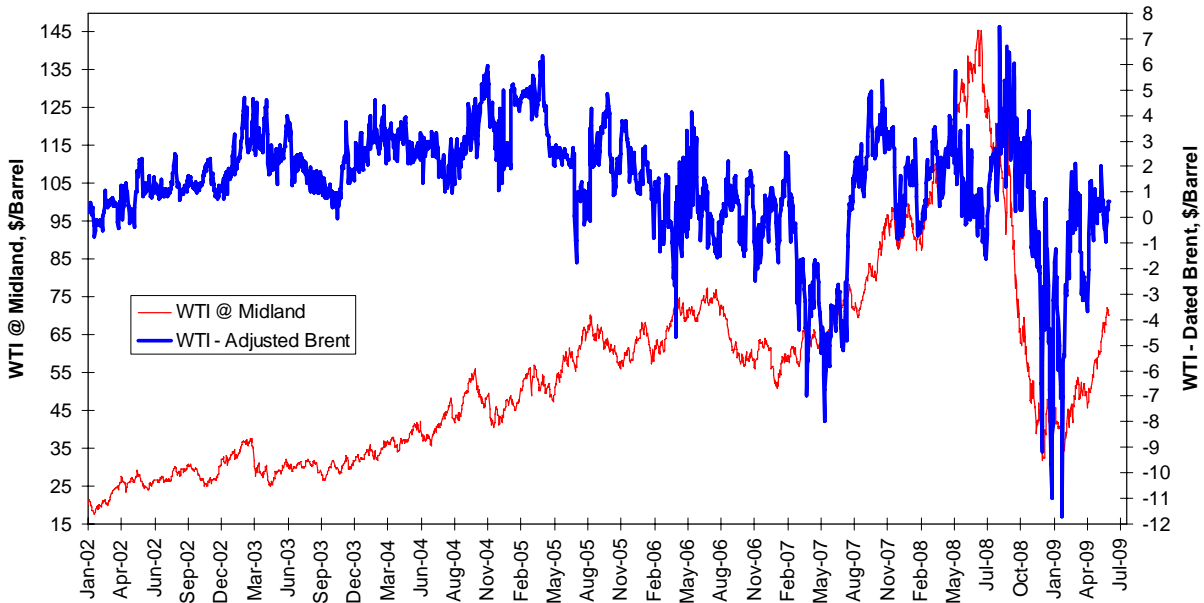
This spread was mean-reverting tendencies for years; mean-reversion in a spread is one sign of the legs being substitutes for one another. A major violation of the mean-reversion range occurred during the enormous price rally and subsequent collapse of 2008.

The LLS - Brent Spread And LLS Prices



Is the spread between time-adjusted Brent at the USGC and WTI at Midland, Texas, different from the one seen above? Yes, very much so. WTI was affected by storage conditions at Cushing that pushed the mid-continent into a massive discount and contango twice in recent years. This spread has trending characteristics, evidence the two commodities are not related as closely as we might suppose.

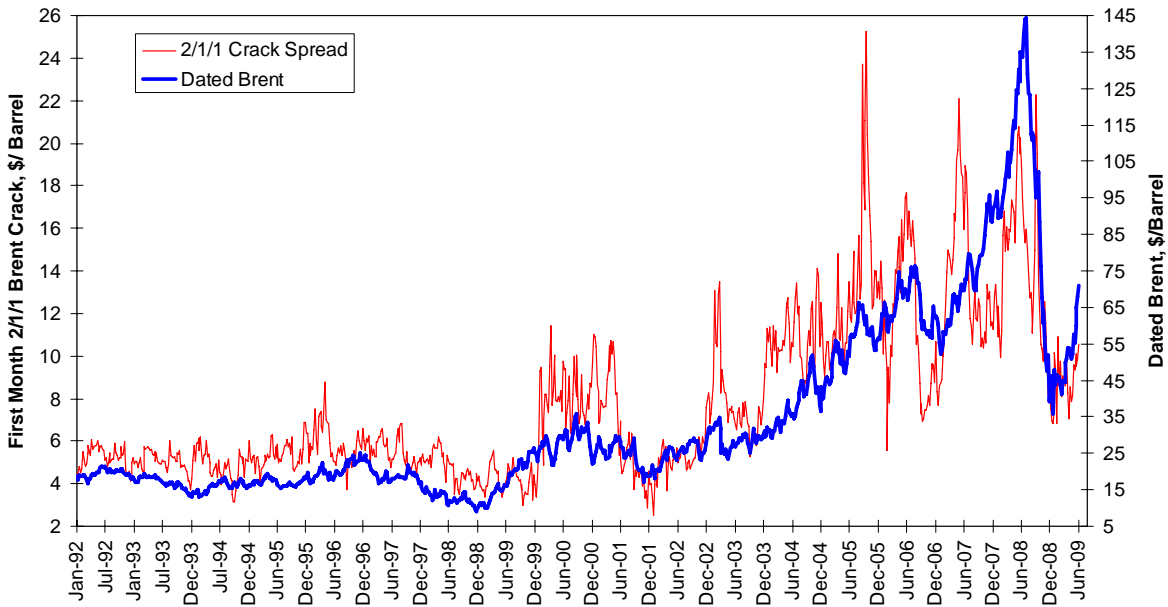
The WTI - Brent Spread And WTI Prices



However, the universe of traders who can access these cash markets is limited; chances are everyone reading this is confined to the futures market. While you must recognize the factors affecting the Brent-WTI spread, there is no reason to let the best be the enemy of the good; the spread affords too many good trading opportunities to forego.

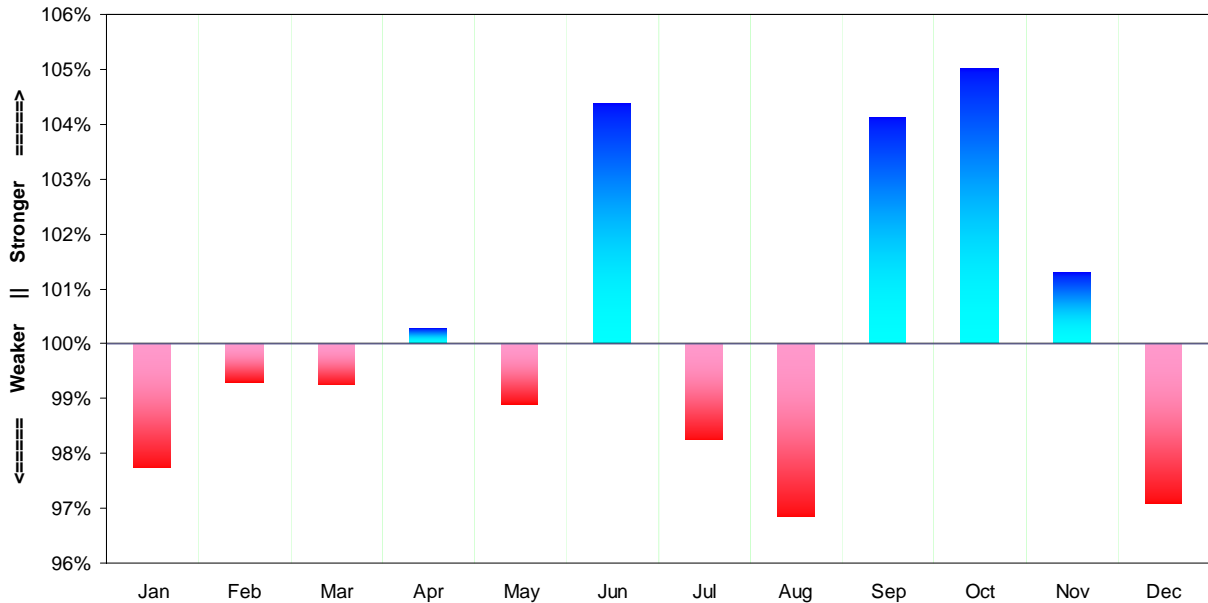
One of its primary drivers is the refining margin received for Brent-basis cargoes in the U.S. The higher the crack spread, here measured as the front-month 2-1-1 (two barrels of crude oil into one each of heating oil and gasoline) crack spread goes, the more attractive incremental cargoes of sweet crude oil become for U.S. refiners. For this reason, the price of Dated Brent tends to track the U.S. 2-1-1 crack spread closely.

The Trans-Atlantic Crack



As crack spreads are seasonal, we should expect their rhythm and their effect on the price of Dated Brent to impose seasonality on the Brent-WTI spread, and they do. If we run a seasonal adjustment on the monthly averages of the Brent-WTI spread, we find the spread is seasonally weaker in the winter months and again in the late summer. The spread is strongest in June and again between September and November.

Seasonal Adjustment Divisors For The Brent-WTI Spread

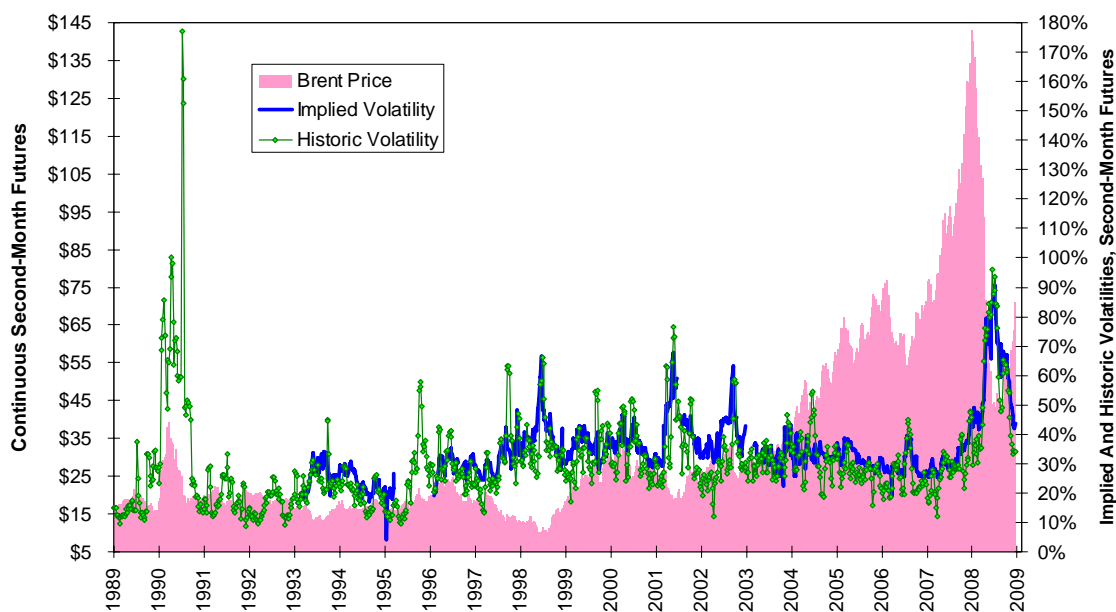


A final and often overlooked factor in spread trading is volatility. This affects the Brent-WTI spread in two ways. The first is higher volatility and steeper backwardation or very deep contango often go hand-in-hand, depending on the structure of crude oil forward curves at the moment. If volatility rises, the two markets will ride up or down their respective forward curves at differential rates, and this will affect the movement of the spread simply as a function of time.

The second impact of volatility is the price dispersion of both markets widens out both on an intraday and on an interday basis. The wider this dispersion of price, the less likely any given price for either market will represent the true economic value of either Brent or WTI at a given point in time, and the harder the spread will be to manage.

Over Brent's history, both realized historic and option implied volatility have tended to rise not during the early phases of a bull market, but rather at the troughs of selloffs. This "investor skew" in volatility is rather like what is seen in equities, and differs markedly from the "demand skew" seen in heating oil and natural gas where anxious buyers set the price. As crude oil producers really do not use the futures markets to floor their output, we have to surmise the increase in volatility is a function of financial traders looking to play one last push lower.

Brent Volatilities Rose As Market Spiked



As time goes on, the underlying production streams for both the North Sea and West Texas will disappear; this has been known for decades, and yet both Brent and WTI have remained marker crudes. Along with a few crude oils from the Persian Gulf, such as Omani Light and Dubai Fateh, they serve as the pricing differential basis for other crude oils and for various financial swaps. Many crude oils; two markers, one spread: While this slogan is unlikely to replace *e pluribus unum* anytime soon, try trading a Latin phrase.