Trading Trends In Energy Spreads

Nothing strikes fear into the collective economic subconscious of the American public like higher gasoline prices: Have we ever even considered going to war to seize the copper mines of Chile or Zaire during any of the three copper price spikes of the past eight years?

Oil companies' public images and political fortunes have suffered because of this fear, as a vast majority of the public in convinced of some sort of price-rigging conspiracy. Yet the abilities of the oil industry to control prices are about as developed of those of mortgage bankers to control interest rates.

Because most U.S. refiners are "crude short," that is they are net buyers of crude oil, they are subject to higher refinery feedstock costs over this volume. Can this situation produce low-risk trading opportunities in what is likely to be an emerging bull market for crude and one more volatile than any in the past four years?

A few preliminary observations about refineries may be useful. First, they are margin operations; it really does not matter what price they pay for crude so long as they can process it profitably into various products. Second, to minimize the risk associated with selling refined products well after the crude oil is purchased, refiners like to fix the price of crude as close to delivery at the refinery as possible. Third, because incremental refinery operations produce less gasoline, refinery economics at the margin are controlled by the profitability of heavier refined products. Finally, refiners as a group see the same price signals simultaneously; this produces cycles where additional purchases of crude oil oscillate from being attractive to unattractive.

These conditions combine to influence the intermonth spread between deferred and spot crude oil purchases. In fact, we should be able to model the nearby/spot spread for crude oil solely on the basis of:

1. The attractiveness of purchasing an incremental barrel of low-sulfur ("sweet") crude oil preferred by refiners for gasoline manufacture, as measured by the spread between the NYMEX West Texas Intermediate (WTI) and IPE Brent Blend contracts, and

2. The attractiveness of increasing refinery output, as measured by the spread between the NYMEX heating oil and crude oil contracts, the "heating oil crack."

Sample regression models to test this assertion were run for the September/August and October/September crude oil spreads in 1994, and for the September/August 1995 spread using data through May 12, 1995.

For October/September 1994
$$Cl_{vu} = .337 * BRCL_u + .133 * HOCL_u, R^2 = .816$$
$$\phantom{Cl_{vu} =} (.0125) (.0052)$$

For September/August 1994
$$Cl_{uq} = .364 * BRCL_q + .161 * HOCL_q, R^2 = .862$$
$$\phantom{Cl_{uq} =} (.0117) (.0052)$$

For September/August 1995
$$Cl_{uq} = .252 * BRCL_q + .121 * HOCL_q, R^2 = .819$$
$$\phantom{Cl_{uq} =} (.0102) (.0056)$$

The results are statistically significant and consistent for both spreads in 1994; the 1995 model is slightly different due to the fact it will trade until the third week of July. Standard errors for each estimate are shown beneath the coefficients for the two independent variables, the Brent/NYMEX spread (BRCL) and the heating oil crack (HOCL).

The economic interpretation of this model is straightforward: As U.S. refiners' spot crude demand surges, the nearby/spot spread moves away from contango and toward backwardation. This increases the differential

between the NYMEX and IPE spot contracts. It also reduces the heating oil crack and thus reduces the incremental return on refining crude.

These strong and linear relationships for the intermonth spread in crude oil are enhanced by the tendencies of both the NYMEX/IPE spreads and the heating oil crack to trend for weeks at a time. This suggests intermonth spreads in crude oil can be traded as a position by watching the other two spreads, and that these other two spreads can be used to hedge a position in the crude oil intermonth spread.