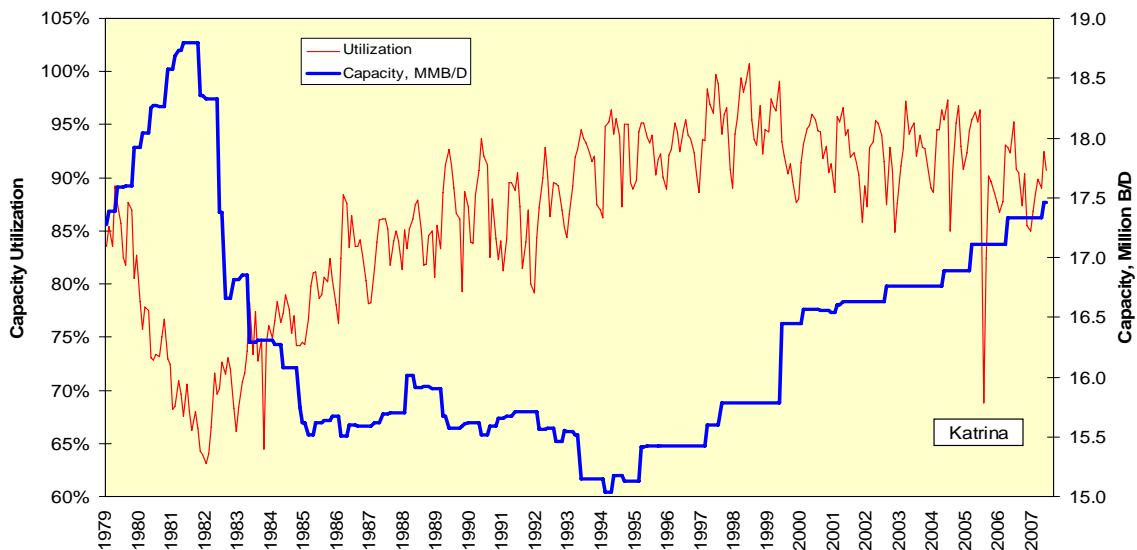


Refiners Getting Squeezed

One of the problems with holding truths to be self-evident is you can get caught holding the bag when reality shifts. One of these truths has been a constraint in U.S. refining capacity. A large number of small refineries and, to a lesser extent, a small number of large refineries closed during the first half of the 1980s as high crude oil prices and declining rates of demand growth led to industry consolidation.

Add to that the various environmental laws affecting the ability to construct new refineries, and the result was a golden age for those refineries still in existence. Onshore refining capacity is still well below levels of a quarter-century ago, and refinery operating rates have remained well over 90% for the past decade. And even though imports of refined products have increased, they have not increased enough to push prices down significantly. No wonder Tesoro has been the top performer in the S&P 500 over the past five years, and both Valero and Sunoco have done pretty well, too.

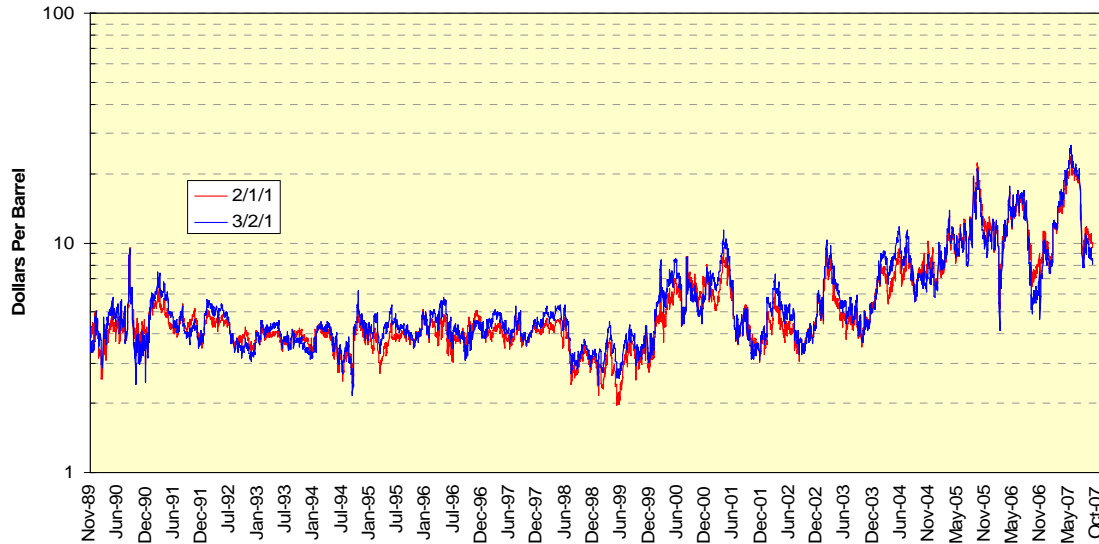
The U.S. Refining Picture



But golden ages do not last forever. One of the key metrics of refining profitability, the crack spread, grew at a near-exponential rate between 1999 and October 2005. This has been true both for the 2-1-1 and the 3-2-1 cracks; the former measures the per-barrel gross margin between one barrel each of heating oil and gasoline less two barrels of crude oil, while the latter measures the per-barrel gross margin between two barrels of gasoline and one of heating oil less three barrels of crude oil.

While both of these margins hit their highs in May 2007, their susceptibility to rising crude oil costs has been apparent for almost two years. The crack spreads are now in retreat, and are still not cheap historically. As crude oil prices push toward new highs and as demand growth is threatened by an economic slowdown, refiners are vulnerable.

Second Month Crack Spreads



Forward Curves

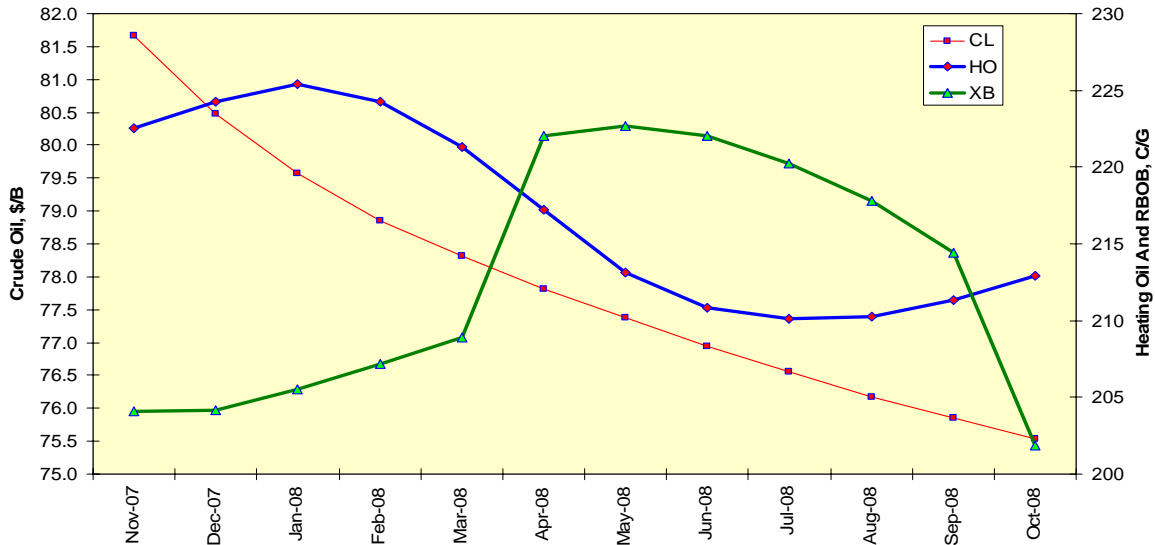
The emerging squeeze on refiners is going to be exacerbated by the return of crude oil's forward curve to backwardation, the situation where each successive month's futures price is lower. Backwardation is a peculiar phenomenon: Even though it tends to occur in bull markets for commodities such as crude oil and base metals where the cheapest place of storage is in the ground, it reflects a consensus between both buyer and seller that the current price is unsustainably high.

Refiners adopt a just-in-time inventory policy to avoid getting stuck with expensive crude oil inventories, and producers who cannot deliver incremental supply into the delivery month lock in high prices by selling back-month futures. The combined effect is for buyers to bid the front-month higher and for sellers to sell the back-months down, thereby creating the declining forward curve.

A second odd thing tends to happen in a backwardated market: Just as a bond "rolls down" the yield curve and is discounted at a shorter-term interest rate each and every day, the crude oil market tends to "ride up" a backwardated curve. As November goes off the board, discounted December rises to the spot price marked by November, January rises to December, etc. This phenomenon will act to push refiners' crude oil costs higher.

The forward curves for heating oil (HO) and RBOB gasoline (XB) have mixed shapes at the moment. The HO market reflects the winter heating season, while the dominant aspects of the XB curve are the April and October shifts to and from, respectively, the more expensive summer grades of gasoline.

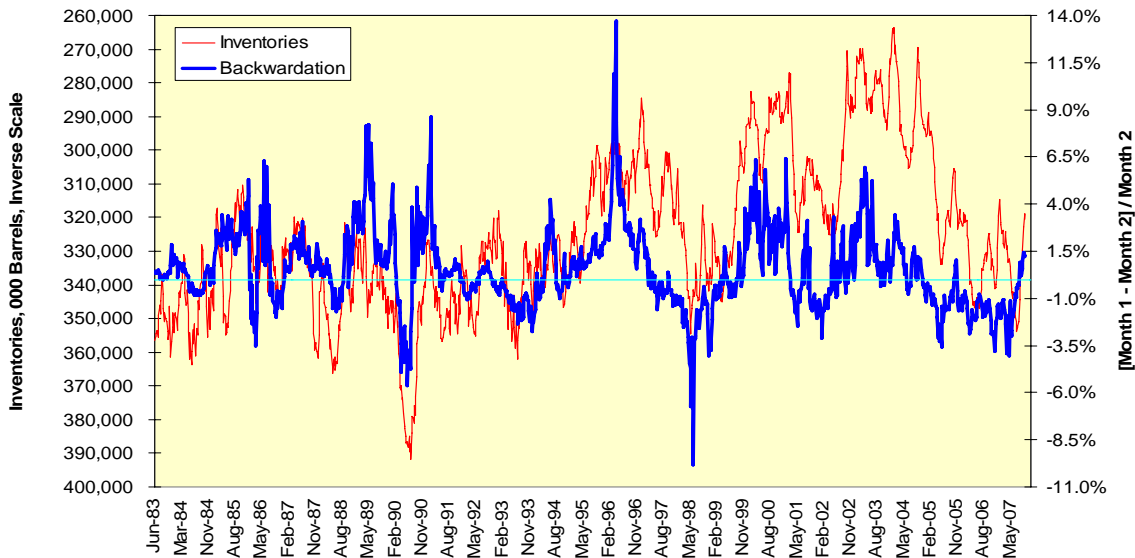
Forward Curves Of Petroleum Complex
September 28, 2007



Backwardation And Inventories

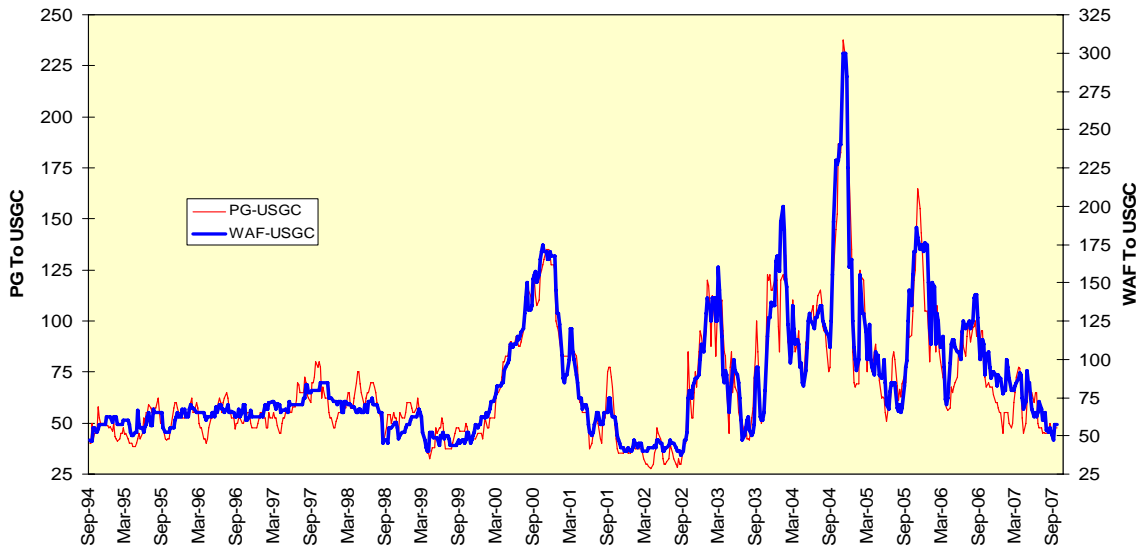
Another aspect of backwardation is it makes inventories expensive to hedge. As I described in [March 2006](#), a forward curve of the opposite shape, contango, makes it profitable to build and hedge inventories. The opposite is occurring now: Inventory levels (plotted inversely) have declined as the market has moved into backwardation. This is exactly what we should have expected.

Inventory Drawdown In Backwardation Expected



Moreover, refiners do not seem to be in a panic to bid cargoes higher in reflection of the just-in-time inventory policy noted above. Tanker rates from both West Africa and the Persian Gulf to the U.S. Gulf Coast expressed in *Worldscale*, or percentage of expected tariff, have declined in recent months. Lower inventories mean higher backwardation and narrower margins for refiners.

Tanker Rates Expressed In Worldscale

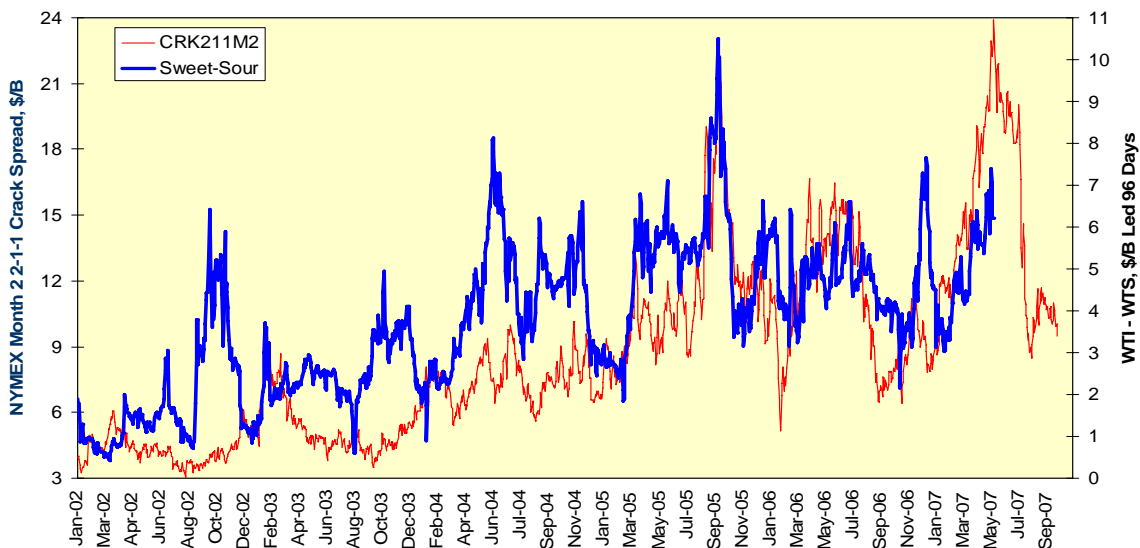


Declining Refinery Demand

Now let's conclude with another key metric for refiners, the spread between the more expensive low-sulfur "sweet" and the more abundant but more difficult to refine high-sulfur "sour" crude oils. The benchmark crude oil futures are for sweet West Texas Intermediate and Brent Blend crude oils. As refinery utilization rates rise, refiners have to bring on lower-efficiency sweet-only processing units, and this pushes the sweet-sour spread higher.

Over time, the second-month 2-1-1 crack spread leads the sweet-sour spread by 96 days on average. Declining crack spreads mean refiners will shut sweet-only processing capacity in and push the sweet-sour spread lower. While the relationship between the sweet-sour spread and crude oil prices is not a direct one, suffice it to say declining refinery demand should not be construed bullishly for refiners.

The Sweet-Sour Spread And NYMEX Month 2 Crack Spread A 96 Trading Day Leading Relationship



Refiners have had a pretty good run for a long time. They are not a short yet, but it certainly is time to lighten your exposure to them. Evident, but not self-evident.