A Spring Fling For Crude Oil?

The global market disruptions between February 27 and March 5 may pass into history as one of the purer illustrations of a chaotic event in finance. Chaos theory, for those old enough to remember the 1980s, enjoyed a brief fad as an analytic tool until people realized it was best suited for producing graphic effects that could be produced far more cheaply by a Lava Lamp.

It had another value, too. Even though it stated market systems were not random but also were not predictable, it could be hauled out to recreate in a computer simulation some manner of market gyration similar to those seen two weeks ago. Some patrons of quantitative research actually paid good money to be entertained by this nonsense, but that is a matter for another day.

While all manner of stock markets collapsed simultaneously, and while risk levels were retracted by selling longs and buying shorts indiscriminately, two generally prominent markets stayed out of the carnage, the euro and crude oil. The course of the euro will be dealt with separately, but I thought this might be a good time to revisit crude oil, last discussed here in October in a column entitled "Petroleum Outlook Unsettled." Unsettled indeed; the market for cash West Texas Intermediate is a mere $0.75 lower since that article was written.

That was then; this is now. A visit to your local service station will confirm gasoline prices once again are on the upswing, and the cold weather prevailing in the eastern half of the U.S. since mid-January has helped pull inventories lower. The crude oil market is being set up for another move higher.

The Current State of Affairs
The forward curve of crude oil futures has remained nearly constant in its shape for more than a year. A passage I first wrote in March 2006 was repeated verbatim in October 2006 and can be repeated verbatim once again:

> *Futures markets are priced on the principle of equivalence. In a perfectly balanced market, you should be indifferent between buying a physical commodity now and storing it yourself for later consumption and buying it for future delivery and letting someone else pay for the storage costs. This idyllic situation, also known as full carry, seldom applies in practice. The world's stackers of wheat and butchers of hogs, not to mention its smelters of copper and refiners of crude oil, cannot afford to run out of inventories and therefore pay for the "convenience" of having excess supplies available.*
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> *This number, dubbed "convenience yield," can be viewed as the commodity buyer's insurance payment for supplies. It also represents the producer's cost of hedging by selling forward in the futures market. For commodities such as crude oil and copper where the cheapest place of storage is with the producer, the convenience yield measure could be quite high.*
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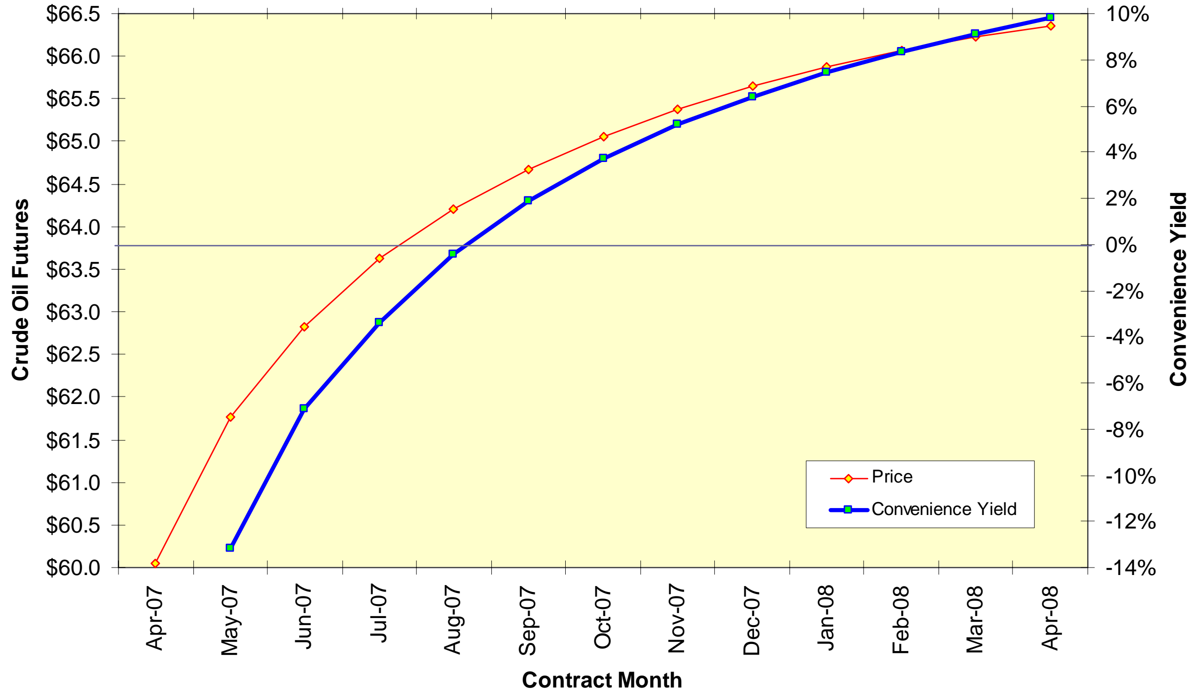
> *At present, the crude oil market's forward curve is in contango, a situation characterized by negative convenience yield. Negative convenience yield means negative insurance costs for refiners, which in turn means they can buy crude oil, pay for all of its storage costs and hedge it by selling the next month's future.*

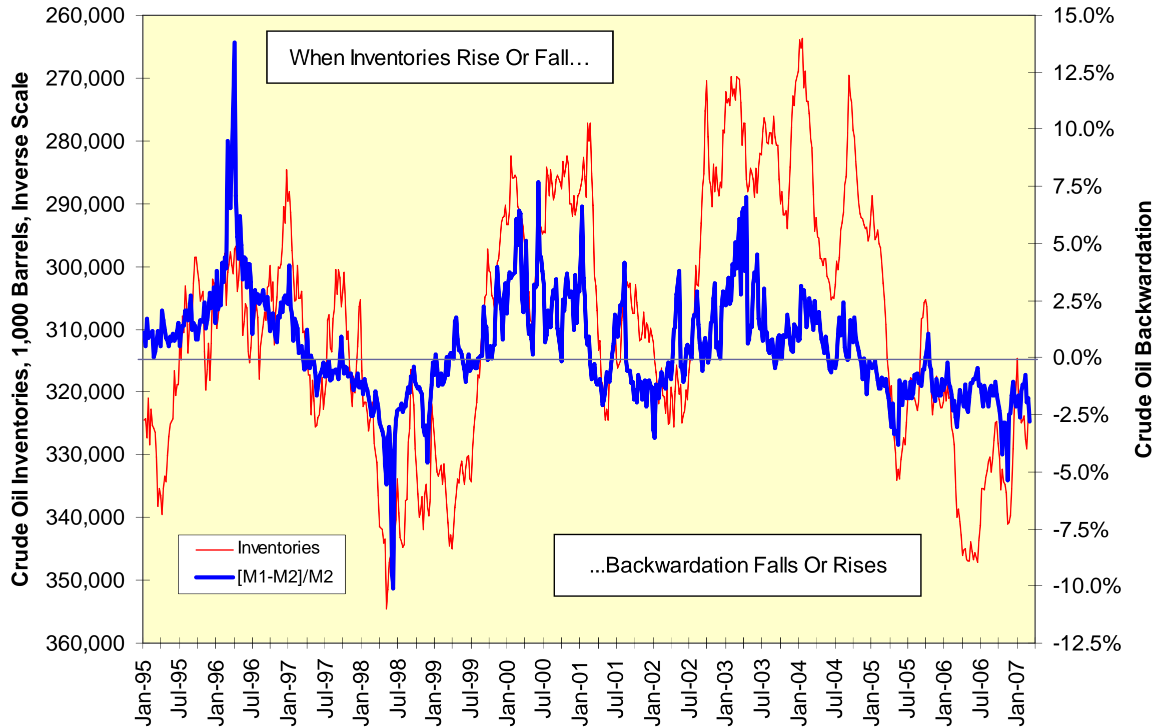


By the way, I cannot resist getting a little "I told you so" dig in at this point. I was countermanded repeatedly on the conference circuit from late 2004 – mid 2006 by representatives of commodity index providers who assured their prospective investors crude oil's forward curve would return to backwardation in the near future, possibly later that afternoon. Please review this posting from April 2005 in response.

The Inventory Picture

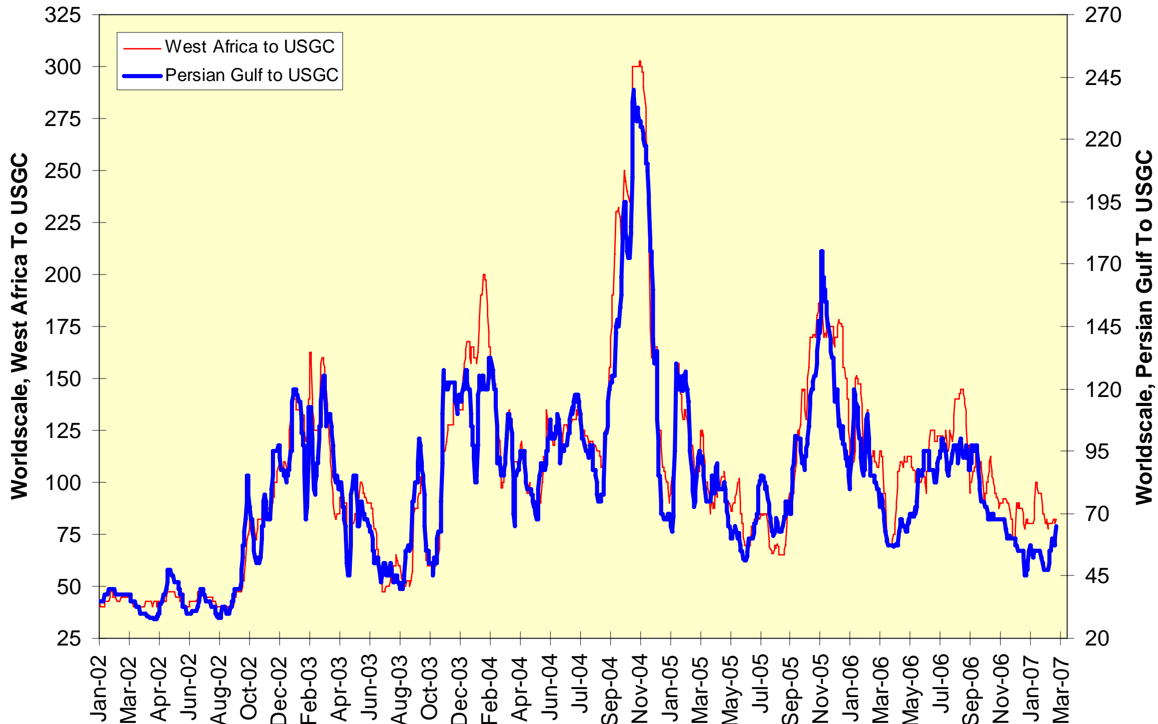
If refiners have had the incentive to rebuild inventories they have not done so yet, nor do key tanker rates indicate such a move is afoot. Crude oil inventories are nowhere near the low end of their range over the past decade, but they are 15.8 million barrels lower than they were a year ago under a near-identical combination of interest rates and contango.

Forward Curve And Inventories



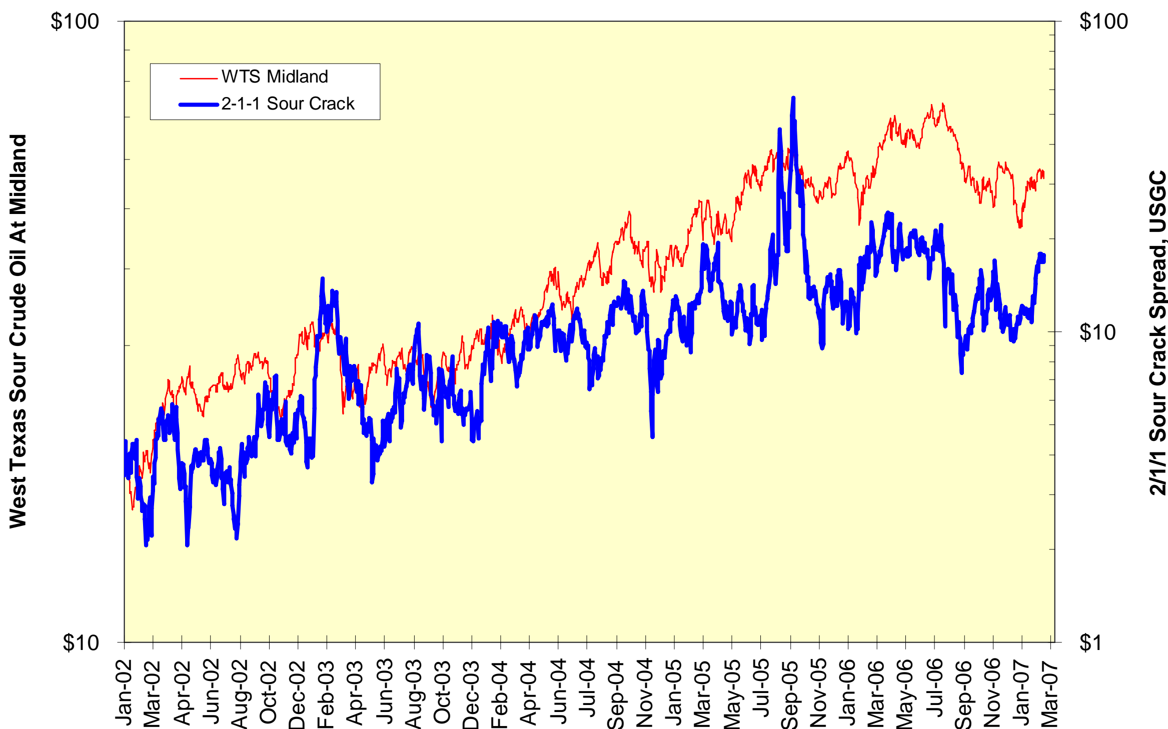
If refiners were scrambling to rebuild inventories, we would see it in rising tanker rates from two key supply sources, West Africa and the Persian Gulf. Both of these rates, expressed in Worldscale or percentage of expected tariff, are on the rise. Should demand for crude oil resume an upward climb, refiners would have to bid tanker rates up to carry those inventories to U.S. Gulf Coast refining centers.

Tanker Rates Going Nowhere



Improving Margins

Refiners are not stupid people; they respond rationally to conditions in the petroleum products markets. A drop in sour (high-sulfur) crude oil refining margins last August led to the downturn in crude oil prices themselves. These margins are now on the rise, and are rising sharply. A 2-1-1 sour crude oil "crack" or refining margin at the U.S. Gulf Coast (two barrels of crude oil, one each of heating oil and gasoline) has increased from $9.51 per barrel in early January to $17.63 per barrel today. As it becomes more profitable to refine crude oil, refiners will bid crude oil prices higher.



If crude oil prices head higher from here, should we dress in sackcloth and ashes and engage in various forms of self-flagellation? No, that would be both unappealing and unnecessary. We have seen this movie before, and stocks did just fine. In fact, we can say rising crude oil prices are a net positive to the market.

Let's return to an analysis first introduced in February 2005 on assessing the impact of factor prices on S&P industry groups, and add the twist introduced in November 2006 on weighting these factors by the groups' representation in the index, we can construct a table of groups both helped and hurt by rising crude oil prices at a 90% confidence interval.

There are 60 industry groups in the S&P 500 accounting for 70.36% of the index' capitalization with a statistically significant negative beta to crude oil prices. If we multiply them by their betas to crude oil, we get a weighted beta of -2.99%. There are only 17 groups with a statistically significant positive relationship to crude oil, accounting for only 14.67% of the index' capitalization. Their betas are much higher, however, giving this set of industries a 3.45% weighted beta for a net weighted beta of 0.45%.

Crude Oil Beta-Weighted Impact On S&P 500

	SPX Weight	CL Beta	Weighted Beta		SPX Weight	CL Beta	Weighted Beta
Pharmaceuticals	6.36%	0.045	-0.29%	Integrated Oil & Gas	6.14%	0.283	1.74%
Industrial Conglomerates	3.82%	0.045	-0.17%	Oil & Gas Equipment	1.38%	0.433	0.60%
Other Diversified Financial Services	5.12%	0.032	-0.17%	Oil & Gas Exploration	0.93%	0.433	0.40%
Computer Hardware	3.23%	0.045	-0.14%	Oil & Gas Drilling	0.42%	0.472	0.20%
Systems Software	2.68%	0.053	-0.14%	Oil & Gas Refining	0.35%	0.418	0.15%
Communications Equipment	2.62%	0.050	-0.13%	Diversified Metals & Mining	0.29%	0.259	0.08%
Integrated Telecommunications	2.97%	0.043	-0.13%	Steel	0.32%	0.169	0.05%
Semiconductors	2.09%	0.047	-0.10%	Multiline Utilities	1.20%	0.040	0.05%
Tobacco	1.60%	0.061	-0.10%	Electric Utilities	1.83%	0.025	0.05%
Multiline Insurers	1.95%	0.047	-0.09%	Gold	0.15%	0.250	0.04%
Diversified Banks	2.34%	0.039	-0.09%	Construction & Farm Machinery	0.79%	0.038	0.03%
Household Products	2.16%	0.041	-0.09%	Aluminum	0.23%	0.098	0.02%
Investment Banking & Brokerage	2.59%	0.031	-0.08%	Agricultural Products	0.18%	0.090	0.02%
Hypercenters & Superstores	1.12%	0.071	-0.08%	Homebuilding	0.23%	0.057	0.01%
Regional Banks	1.82%	0.040	-0.07%	Construction & Engineering	0.06%	0.096	0.01%
Home Improvement Retailers	1.08%	0.064	-0.07%	Gas Utilities	0.07%	0.068	0.01%
Aerospace & Defense	2.51%	0.024	-0.06%	Construction Materials	0.09%	0.050	0.00%
Air Freight & Logistics	0.95%	0.062	-0.06%				
General Merchandise Retailers	0.52%	0.105	-0.05%				
Data Processing & Outsourcing	1.01%	0.052	-0.05%				
Thrifts & Mortgages	1.42%	0.036	-0.05%				
Movies & Entertainment	1.83%	0.027	-0.05%				
Healthcare Equipment	1.68%	0.030	-0.05%				
Property & Casualty Insurers	1.39%	0.035	-0.05%				
Biotech	1.27%	0.038	-0.05%				
Department Stores	0.75%	0.060	-0.04%				
Asset Management & Custodial Banks	1.16%	0.036	-0.04%				
Drug Retailers	0.57%	0.074	-0.04%				
Healthcare Distributors	0.48%	0.084	-0.04%				
Consumer Finance	0.93%	0.033	-0.03%				
Life & Health Insurers	1.30%	0.021	-0.03%				
Wireless Services	0.63%	0.043	-0.03%				
Diversified Chemicals	0.88%	0.027	-0.02%				
Restaurants	0.81%	0.027	-0.02%				
Airlines	0.10%	0.206	-0.02%				
Automobile Manufacturers	0.26%	0.076	-0.02%				
Semiconductor Equipment	0.34%	0.055	-0.02%				
Hotels	0.57%	0.033	-0.02%				
Application Software	0.40%	0.046	-0.02%				
Computer Storage & Peripherals	0.48%	0.036	-0.02%				
Food Retailers	0.38%	0.044	-0.02%				
Packaged Foods	0.93%	0.018	-0.02%				
Computers & Electronics Retailers	0.20%	0.072	-0.01%				
Specialty Stores	0.30%	0.044	-0.01%				
Apparel Retailers	0.24%	0.053	-0.01%				
Environmental Services	0.17%	0.067	-0.01%				
Casinos & Gaming	0.23%	0.041	-0.01%				
Electrical Components & Equipment	0.43%	0.020	-0.01%				
Apparel & Accessories	0.31%	0.028	-0.01%				
Auto Parts & Equipment	0.15%	0.058	-0.01%				
Personal Products	0.18%	0.041	-0.01%				
Leisure Products	0.15%	0.044	-0.01%				
Household Appliances	0.16%	0.038	-0.01%				
Office Electronics	0.13%	0.044	-0.01%				
Specialty Chemicals	0.19%	0.027	-0.01%				
Electrical Equipment Manufacturing	0.12%	0.040	0.00%				
Office Services & Supplies	0.13%	0.024	0.00%				
Distributors	0.07%	0.046	0.00%				
Diversified Commercial Services	0.08%	0.035	0.00%				
Photo Products	0.05%	0.046	0.00%				
				Subtotal:	14.67%		3.45%
Subtotal:	70.36%		-2.99%	**Total:**	**85.03%**		**0.45%**

The next time you hear some talking head go on about how stocks rose “in spite of rising crude oil,” you can smile and say, “that’s because of rising crude oil.”