

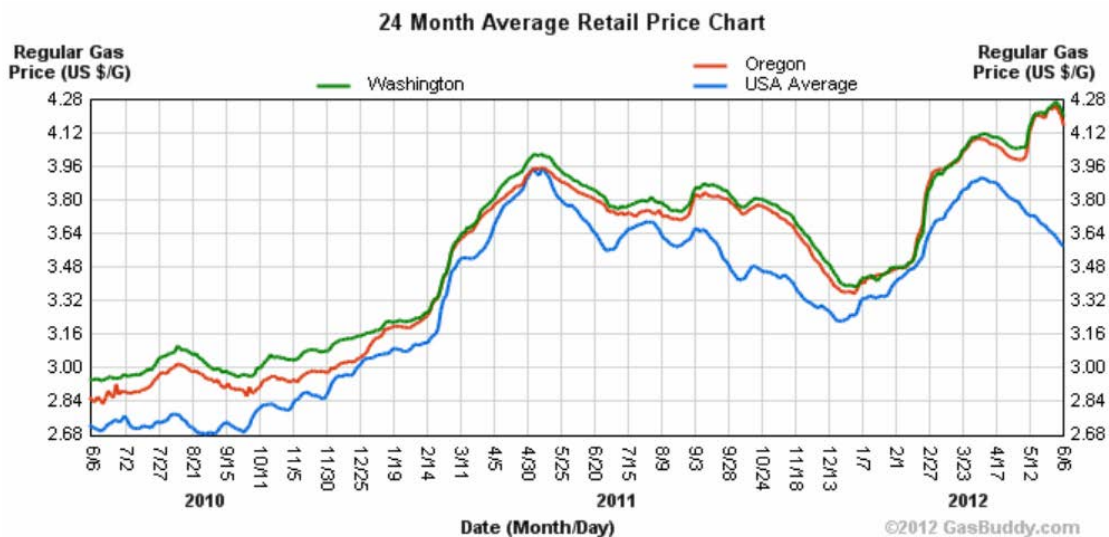
# McCULLOUGH RESEARCH

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Date: June 5, 2012  
To: McCullough Research Clients  
From: Robert McCullough  
Subject: Analysis of West Coast Gasoline Prices

Since the beginning of 2012, the crude oil markets have experienced a suspicious combination of rising supplies, falling demand, increasing inventories, and increasing prices. The situation is roughly similar to the oil bubble in 2008 where high prices were accompanied by increasing supplies and decreasing demand.

Since the beginning of May, U.S. crude oil prices have fallen 20%. The comparable benchmark price for non-U.S. markets has fallen 17%. U.S. prices, set by markets at Cushing, Oklahoma, have fallen below international markets since 2008 as burgeoning U.S. and Canadian oil production has stressed oil transport infrastructure. Combined with rising ethanol production, this has created a gasoline price discrepancy between the relatively isolated West Coast of the U.S. and lower prices in the Midwest and South.



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The chart above indicates that the differentials between West Coast and U.S. prices were low last winter. Over the past weeks, prices in Seattle and Portland have diverged significantly from prices elsewhere in the U.S. While U.S. gasoline prices have declined with the price of crude oil elsewhere in the U.S., prices have increased on the West Coast.

As a general rule, retail prices follow crude oil prices. Energy Information Administration (EIA) data indicates that gasoline is seldom transported between the West Coast and the Eastern U.S. Given the lack of supply from the East, West Coast gasoline prices are more closely correlated with international prices than crude oil prices at Cushing, Oklahoma.

The relationship is highly stable except for the past few weeks. Retail gasoline prices would have fallen to \$3.51/gallon this week if prices had followed supply costs. As of yesterday, actual prices now are \$.77/gallon higher than would have been expected given crude oil prices.

The sudden price shift has provided a significant windfall for refineries and retailers on the West Coast. At a differential of \$.77/gallon, this translates into a windfall profit for suppliers of \$48 million dollars a day.

The primary question is whether this price increase was an inevitable result of a fire at the Washington BP refinery and maintenance shutdowns in California, or the result of pivotal suppliers taking advantage of an opportunity to force retail prices up for a windfall profit. The very preliminary evidence does not support the hypothesis that this is an inevitable result of refinery shutdowns.

The primary explanation in the press for the unprecedented divergence of West Coast prices from prices elsewhere in the U.S. is the shutdown of a number of West Coast refineries:

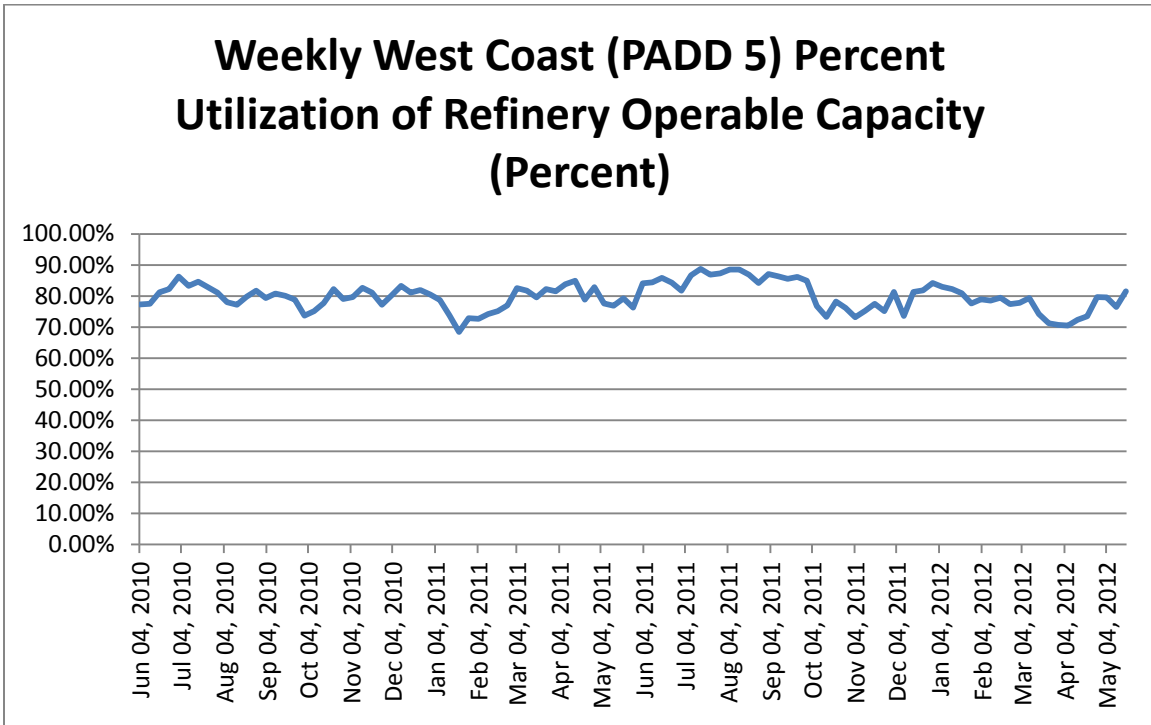
| Company        | Location         | Refinery Output bbl/day | Online | Date Shutdown | Date resumed        | Reason for Closure       |
|----------------|------------------|-------------------------|--------|---------------|---------------------|--------------------------|
| Tesoro         | Martinez, CA     | 166,000                 | Yes    | 5/2/2012      | 5/13/2012           | Hydrocracker Broken      |
| Shell          | Martinez, CA     | 156,400                 | Yes    | 4/27/2012     | 5/16/2012           | Maintenance              |
| Chevron        | Richmond, CA     | 246,000                 | No     | 5/12/2012     | Planned for 5/28/12 | Seasonal Maintenance     |
| BP             | Carson, CA       | 265,000                 | Yes    | 5/15/2012     | 5/21/2012           | Planned Flaring          |
| Alon           | Bakersfield, CA  | 14,500                  | No     | 4/20/2012     | N/A                 | Hydrocracker Restared    |
| Tesoro         | Anacortes, WA    | 12,000                  | Yes    |               |                     | Minor production problem |
| ConocoPhillips | Rodeo, CA        | 122,000                 | Yes    | 4/25/2012     | 6/5/2012            | Fire                     |
| BP             | Cherry Point, WA | 225,000                 | Yes    | 2/17/2012     | 5/30/2012           | Fire                     |
| ExxonMobil     | Torrance, CA     | 155,000                 | Yes    | 6/4/2012      | N/A                 | Planned Maintenance      |

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This explanation is not well supported by EIA refinery availability statistics. The following chart reports refinery availability percentages:



Taken at face value, the EIA data would appear to indicate that the available refinery capacity should have been sufficient to meet the shortfall caused by fires and maintenance shutdowns. Although refinery utilization fell to 70% in March, the climb in retail prices relative to oil costs did not begin until May. The EIA statistics showed that refinery operations were recovering in May.

It should also be noted that in January 2011, utilization of capacity fell below 70% without a comparable price increase. Statistically, EIA capacity utilization figures are not correlated with West Coast retail prices.<sup>1</sup>

Inventory data from the EIA indicates that 2012 is very different than 2011. As mentioned above, transfers of retail gasoline between the West Coast and the rest of the U.S. are rare. In 2012, inventories have plunged below normal levels. The next chart

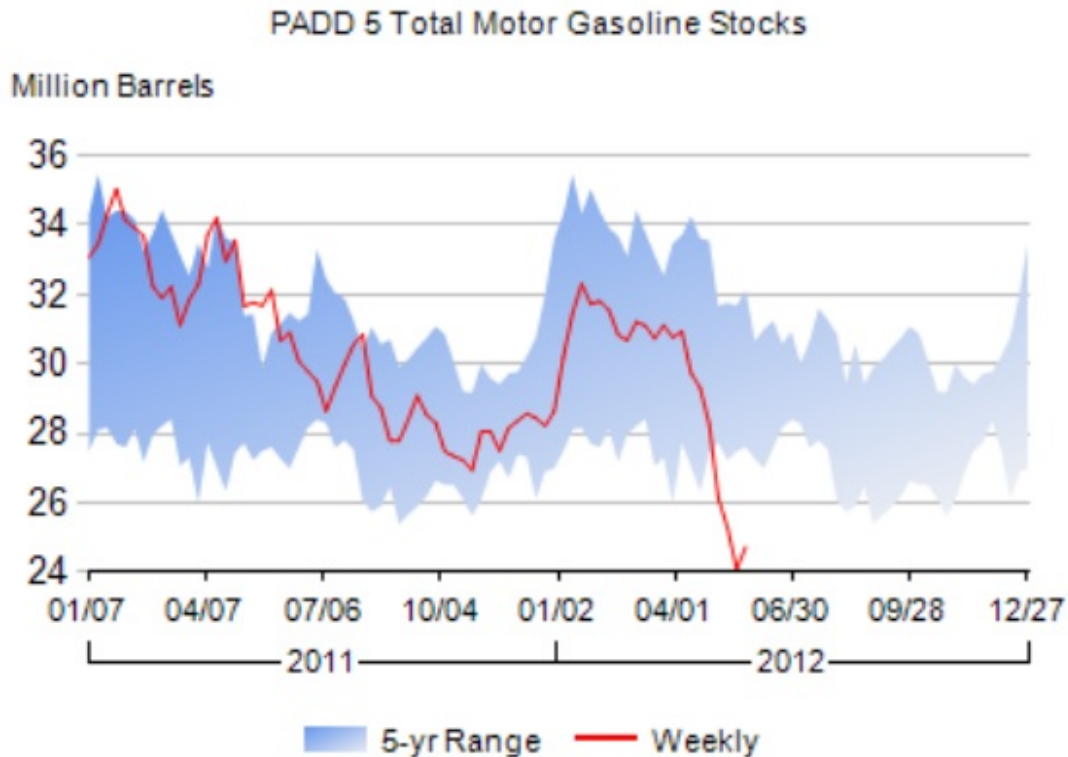
<sup>1</sup>West Coast retail gasoline prices are highly correlated with the Brent crude price benchmark. The EIA capacity utilization data shows no statistically significant correlation with West Coast retail prices.

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shows inventories are far below normal levels and below the five-year band of expected inventories:



Over the last few weeks, inventories have fallen far below normal standards.<sup>2</sup>

Gasoline inventory levels are, however, significantly correlated with gasoline prices. Unlike capacity utilization data, gasoline inventory data is highly correlated with retail prices. The fall in inventories is a statistically significant determinant of retail prices. Additional evidence suggests that retail prices on the West Coast are “Granger caused” by gasoline inventories.<sup>3</sup>

<sup>2</sup> “PADD 5” in the chart above is the EIA’s term for the West Coast of the U.S. plus Alaska and Hawaii.

<sup>3</sup> Granger causality asks the question whether rain causes umbrellas or umbrellas cause rain. If umbrellas appear after the rain starts, we would infer that rain “Granger causes” umbrellas. If we observed that people unfurled their umbrellas before the rain commenced, we would believe that the act of unfurling umbrellas brought down the rain.

This implies that decisions to close a refinery will increase retail prices as demand is met from inventories rather than production. Each of the market participants is certainly aware of these market forces.

The oil industry is highly concentrated. When competition is attenuated, a single actor or a very few actors acting together can set the price in the market. This condition is often described as one where pivotal suppliers have significant market power. It is often true that for isolated markets like the West Coast pivotal suppliers have the ability to set prices even if they would not trigger traditional market power indices like the Herfindahl–Hirschman Index (HHI).

EIA refinery statistics indicate that the HHI for West Coast refineries producing gasoline is over 2,000 if all capacity is available. The U.S. Department of Justice sets an HHI over 1,800 as a benchmark for highly concentrated industries.<sup>4</sup>

Obviously, the fire at BP's Cherry Point refinery in Washington has increased the degree of market concentration significantly.

This raises the question whether the timing of maintenance at the California refineries reflects normal operations or the exercise of market power. In a competitive market, maintenance would have been delayed to take advantage of the rising West Coast prices. Given the limited data available concerning the maintenance shutdowns in California, it is impossible to judge to what degree these curtailments could have been delayed.

Given startup problems in Washington, the refineries in California not only meet the HHI criteria for market power, but they are also pivotal since no ready replacements for their production are available.

A prudent policy response to the current divergence in retail prices would be to determine whether shutdowns were required and why the refineries have not returned to service.

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<sup>4</sup> See [http://www.justice.gov/atr/public/guidelines/horiz\\_book/15.html](http://www.justice.gov/atr/public/guidelines/horiz_book/15.html).