

Using Brent and WTI Oil Prices to Predict Gasoline Prices

In early 2010, the spot price of Brent crude oil—the European petroleum industry benchmark—began to rise relative to the spot price of West Texas Intermediate (WTI) crude oil—the U.S. benchmark. WTI has usually traded at a premium to Brent. From January 1985 to December 2009, the WTI premium averaged roughly 5.5 percent (\$1.33 per barrel) relative to Brent. Since January 2010, the spot price of WTI has traded an average of roughly 5.25 percent (\$5.17 per barrel) below that for Brent. The chart shows that the premium widened in 2011 to an average of roughly 14 percent (\$13.93 per barrel). Moreover, the price of WTI seems to have diverged from the prices of other domestic (U.S.) crude oil grades, such as Louisiana Sweet or Alaska North Slope.

Should this price divergence cause forecasters to use Brent rather than WTI to forecast U.S. gasoline prices? The answer depends on whether this divergence persists. Many energy analysts believe the relative decline in WTI prices reflects an increase in the supply of crude oil flowing into the Cushing, Oklahoma, terminal (where WTI is priced) as a result of increases in (i) crude oil imports from Canadian oil sands and (ii) crude oil production at the Bakken shale formation in the Northern Plains. The surge in supply from these two sources has already spurred actions to alleviate the bottleneck at Cushing, including new pipelines and shipment of oil by rail directly from North Dakota to West Coast oil refineries. Thus, over time, WTI prices may adjust to historical norms (relative to other grades). However, some energy economists, who point to the steady decline in production from North Sea oil fields and the so-called dieselization of European motor vehicle markets, contend that the WTI-Brent divergence will likely be long lasting, if not permanent.¹

Using historical data leading up to 2010, we constructed forecasts of retail monthly gasoline prices from January 2010 to July 2011 (the period of divergence) to determine whether WTI is still as accurate a predictor of gasoline prices as Brent. The chart plots actual retail gasoline prices and forecasts of gasoline prices based on Brent and WTI crude oil prices. The chart indicates that both oil prices were accurate predictors of gasoline prices in 2010. Beginning in January 2011, however, WTI oil prices underpredicted the rise in gasoline prices, which peaked at a little less than \$4.00 per gallon in May 2011. Brent, on the other hand, appears to have better predicted the run-up

in gasoline prices in 2011 but not to have fully anticipated the peak in prices. Since May 2011, however, Brent appears to have been a better predictor of gasoline prices than WTI.

To confirm this finding, we constructed root mean squared forecast errors (RMSE) for each of the Brent- and WTI-based gasoline forecasts from January 2010 to July 2011. The RMSE is a common statistic for assessing the accuracy of time-series forecasts. In results not reported here, the RMSE using Brent prices over this period was a little more than 9 cents per gallon, whereas that for WTI was a little less than 23 cents per gallon.

In summary, this simple forecasting analysis suggests that if the divergence between WTI and Brent prices persists, economists and energy analysts may want to focus on the latter benchmark when predicting the level of gasoline prices.

—Kevin L. Kliesen and Michael T. Owyang

¹ See Verleger, Philip K. Jr. “The Margin, Currency, and the Price of Oil.” *Business Economics*, April 2011, 46(2), pp. 71-82.

