Early 2020 Refining Boost Hit by Demand Destruction

Stronger gas cracks give way to virus fears.

Morningstar Commodities Research
9 March 2020

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Data Sources for This Publication
EIA
CME Group

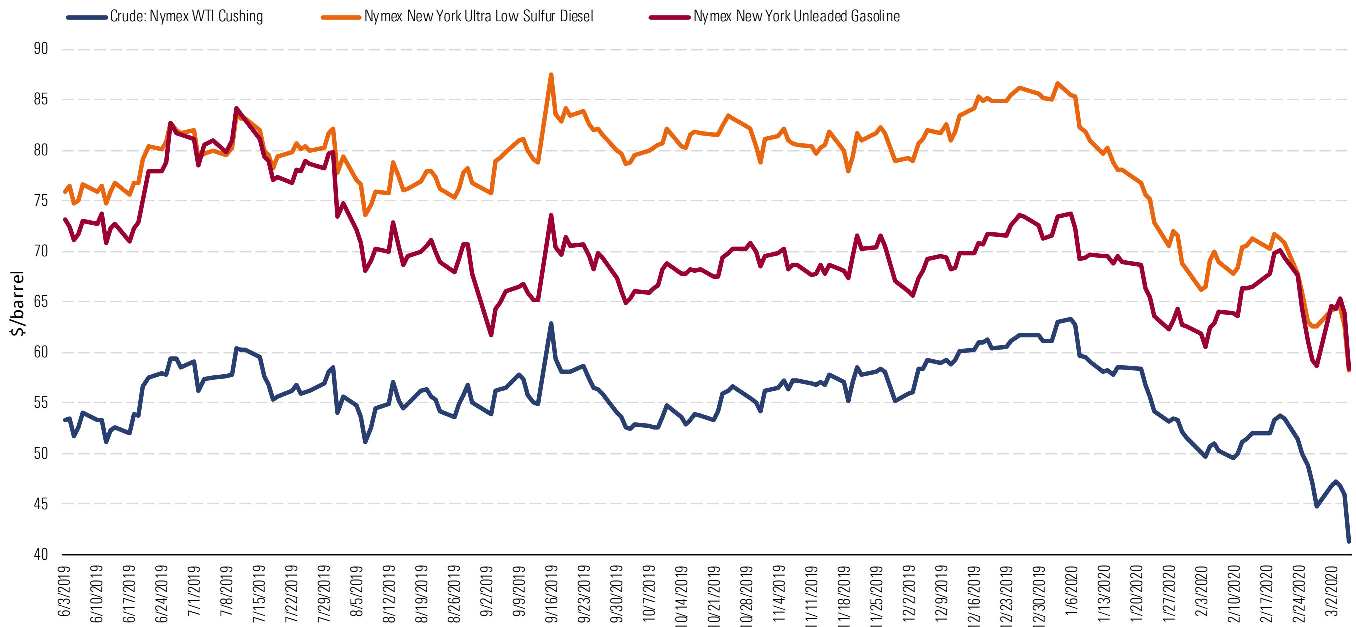
To discover more about the data sources used, click here.

Crude Rout

CME Nymex West Texas Intermediate Crude for Cushing delivery settled Friday at $41.28/barrel–down 28% relative to its 2019 average of $57/barrel and 35% from its recent high of $63.27/barrel on Jan. 6, 2020. The principal causes for this crude rout are demand destruction courtesy of the coronavirus and Russia's failure to join OPEC by cutting production. Up until the third week in February United States refiners experienced a strong start to 2020 as they successfully navigated the International Maritime Organization's new ship's bunker regulations and inadvertently benefited from higher gasoline prices. This note reviews the refiner's start to 2020 and how the coronavirus impacts their outlook.

Normally when crude prices fall, refined products take a while to catch up, but in the case of the coronavirus the damage is universal across the complex. The virus-related nosedive that started on Feb. 21 and took a turn for the worse last Friday has seen prompt CME Nymex WTI crude fall 23%, New York Harbor ultralow sulfur diesel 18% and CME New York Harbor gasoline 16% over the past ten days. Gasoline and diesel have fared better since Feb 28 as crude continued to retreat (Exhibit 1) The recent rout is an extension of oil price weakness since the start of the year with crude down 35% and ULSD down 32% since their recent high on Jan 6, 2020. Only gasoline held up better this year with its losses since Jan. 6 limited to 21%. As we detail below, the relative strength of gasoline has been helped by reduced supply due to plant outages and a refiner strategy to meet the IMO's ship bunker fuel regulations implemented Jan. 1, 2020 (see our recent note: "IMO 2020 Scrubber Payout Less Than One Year").

Exhibit 1 CME Nymex Prompt Crude and Product Prices



Source: CME Group, Morningstar commodities.

Run Up to IMO

During the final quarter of 2019, prices for CME Nymex ULSD (orange line, Exhibit 1) held an average $12.55/barrel premium over Nymex gasoline (red line). This ULSD premium was supported by two factors. First, prices were buoyed by the belief that new IMO 2020 regulations on Jan. 1 would crank up demand for marine gasoil that comes from the same part of the barrel as ULSD. Traders believed marine gasoil would be used to replace high sulfur fuel oil, or blended with the latter, to make very low sulfur fuel oil to meet the new bunker specification. Second, relative to in-demand diesel, tepid consumption during the summer left gasoline inventories at record levels from the end of November, putting downward pressure on gas prices.

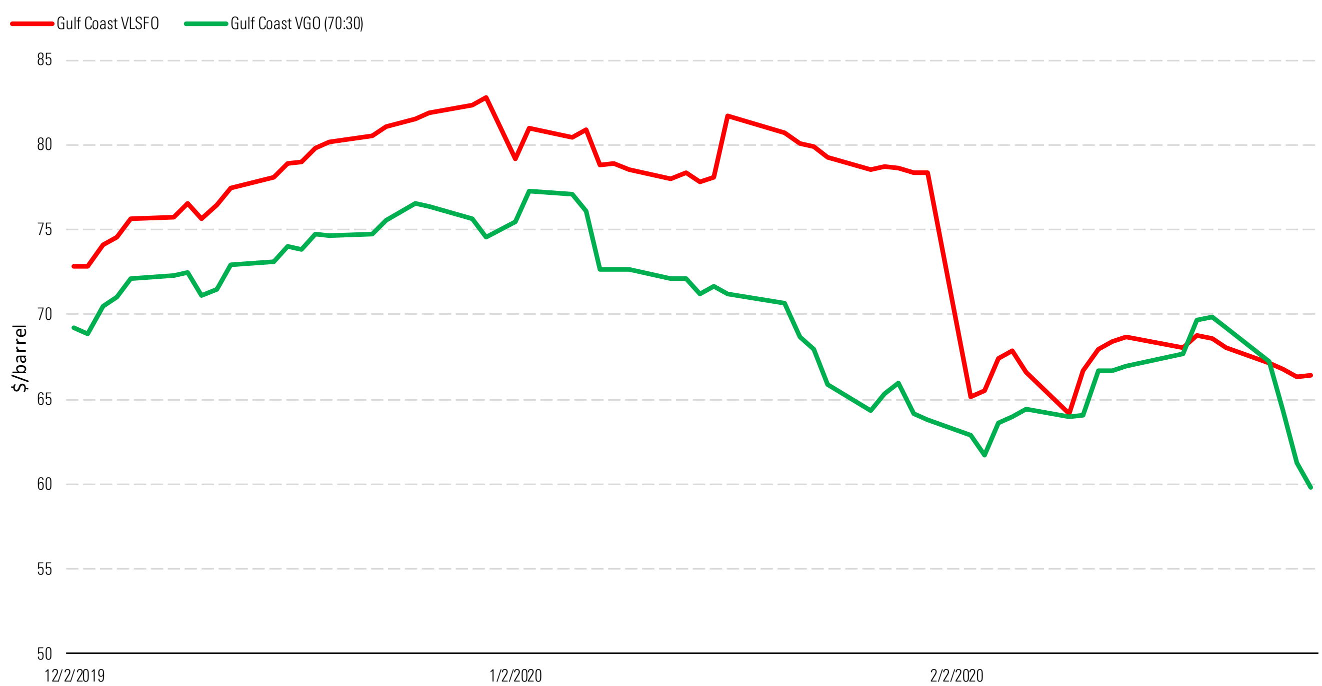
The robust diesel premium narrowed sharply in January 2020 and nearly disappeared by the end of February as ULSD prices fell further and faster than gasoline. Diesel weakness is partly explained by the failure of expected IMO demand to materialize because, as we detail below, refiners used an alternative strategy to produce VLSFO. ULSD prices were also weakened by unusually mild winter weather that dampened demand for closely related heating oil.

VGO Play

As it turned out, U.S. refiners didn't draw heavily on ULSD inventory in January to blend the new bunker fuel. Instead they prepared adequate stocks of VLSFO before the end of the year and after Jan. 1, 2020, took advantage of favorable economics to blend VLSFO using a refinery intermediate called vacuum gasoil, or VGO. That opportunity arose when VLSFO prices unexpectedly surged higher than the value of refined gasoline and diesel that could otherwise be produced from VGO.

Refineries that have vacuum distillation capacity break down heavy residual oil from atmospheric distillation at high temperatures in a vacuum to produce light and heavy VGO. This refinery intermediate is either sold as a feedstock to more sophisticated plants or run through catalytic cracking units to make gasoline and diesel components—typically in a ratio of 70% gasoline and 30% diesel. Refiners usually buy VGO when they want to increase throughput to their cracking units. In this case, however, the price of VLSFO since the beginning of December 2019 was higher than the implied value of VGO based on a 70/30 gasoline/diesel ratio. CME Group data for Gulf Coast swaps indicates VLSFO averaged $5.36/barrel higher than VGO between Dec. 2, 2019 and Feb. 27, 2020 (Exhibit 2). That premium incentivized refiners to use low sulfur VGO to blend VLSFO instead of running it through their cracking units to make gasoline and diesel.

Exhibit 2 U.S. Gulf Coast VLSFO and VGO Prices



Source: CME Group, Morningstar commodities.

The side effect of increased VGO blending into VLSFO is reduced output of gasoline and diesel from cracking units. Assuming a 70/30 gasoline/ULSD ratio, the result is a material reduction in gasoline available to the market.

Unplanned Outages

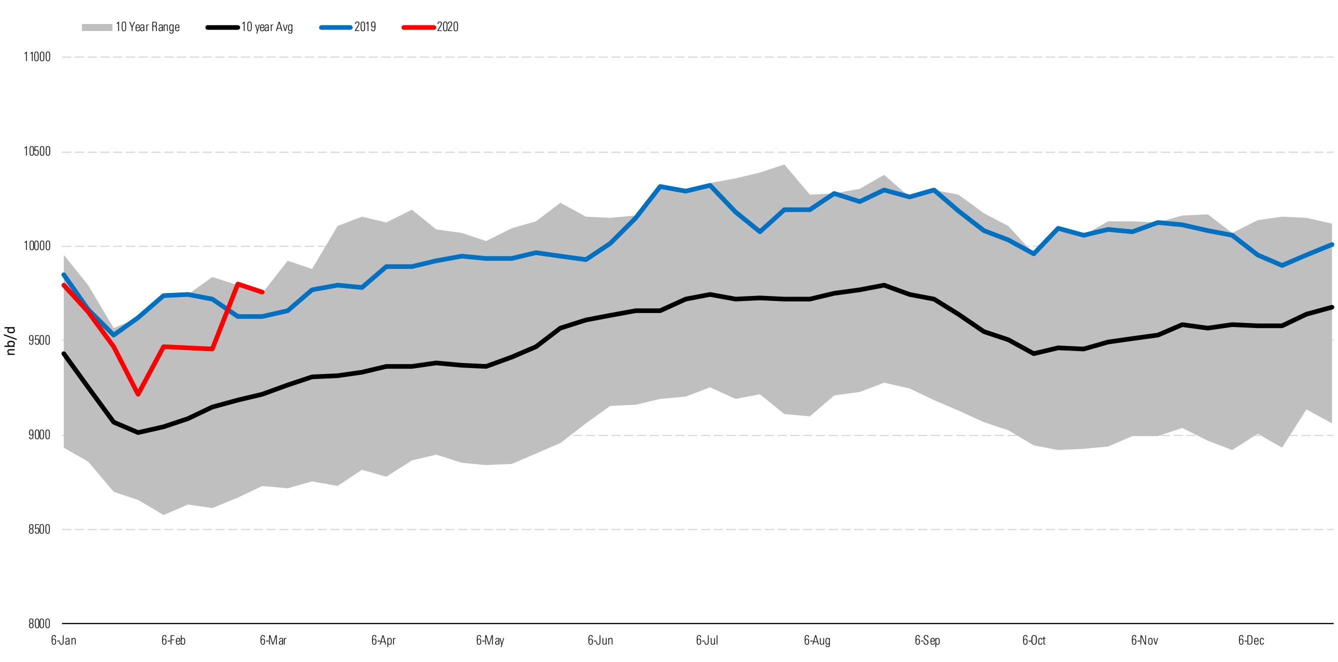
The domestic gasoline shortage due to VGO swapping has been compounded by several unplanned refinery outages that further reduced output from fluid cat cracking and catalytic reformer units primarily used to make gasoline components. Weekly data from the Energy Information Administration shows overall refinery run rates during January and February were at, or above, normal levels for this time of year. Since this is generally when maintenance is carried out, before refiners crank up output in March and April for the summer driving season, processing capacity at this time of year is lower anyway. But a number of significant unplanned outages have materialized in the past two months including reformers at eight refineries (Phillips 66 Ponca City, Oklahoma; Holly Frontier El Dorado, Kansas; PBF Energy Toledo, Ohio; Citgo Lake Charles, Louisiana; Marathon Catlettsburg, Kentucky; Phillips 66 Borger, Texas; CVR Coffeyville, Kansas and ExxonMobil Beaumont, Texas). A complete shutdown of ExxonMobil's 503,000 barrels per day Baton Rouge, Louisiana refinery for most of February due to a fire, has also impacted gasoline supply.

Gasoline Boost Before the Virus

The result was a sharp fall in gasoline production this January. Four-week average EIA refinery data show U.S. gasoline production falling by 0.9 million barrels per day between the week ending Dec. 27, 2019 and the week ending Jan. 24, 2020 before slowly recovering in February (Exhibit 3). Lower gasoline production helped to keep prices high relative to crude and diesel during February—producing a boost to the Nymex gasoline crack (the spread between gasoline and crude prices). The gasoline crack shot up 37% from $11.79/barrel on Feb. 3 to $16.15 per barrel on Feb. 24 while the Nymex diesel crack only crept up 1% over the same period.

Since Feb 24 prices for both products have retreated in the coronavirus rout with gasoline falling faster due to fears about the impact on driving demand of potential quarantines.

Exhibit 3 Seasonal Four-Week Average U.S. Gasoline Production



Source: EIA, Morningstar commodities.

Coronavirus Outlook

It's not our job to predict the outcome of the coronavirus epidemic–we can only hope its human impact is limited. We assume it will cause significant refined product demand destruction that maintains downward pressure on prices. The only way refiners benefit in that scenario is if refined product prices hold up better and longer than crude, allowing them to preserve better margins. That's usually how it works out for refiners, but as we pointed out earlier, this time the immediate threat to economic activity and driving has hit gasoline just as hard as crude.

In the medium term as the virus threat subsides, perhaps in a few months, the speed of return to normal demand will determine how quickly refiners recover from this system shock. For Gulf Coast refiners any domestic impact will be exasperated by the loss of export markets. Through Feb. 28 weekly EIA data show U.S. net exports of gasoline and diesel maintaining record seasonal levels so far this year–continuing an expanding trend since 2012. Most product exports are produced by Gulf Coast refineries and sent to Mexico and other Latin American destinations. We expect those destinations to experience demand shrinkage as the virus impacts them, further reducing Gulf Coast demand. Airline travel is already being impacted and that translates to lower demand for jet fuel nationwide, that is likely to continue until confidence returns.

Back to Normal?

The only good news is that lower oil prices will encourage higher consumption when normal conditions return–causing a jump in refinery throughput. When that happens gasoline demand could stay higher for longer if consumers favor shorter vacations using auto's over foreign adventures.

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