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Record Runs and Strong Margins Boosted Refiners in 2018
Major trends and influences in the U.S. refining sector.

Morningstar Commodities Research
14 January 2019

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Data Sources for This Publication
U.S. Energy Information Administration
CME Group
To discover more about the data sources used, click here.

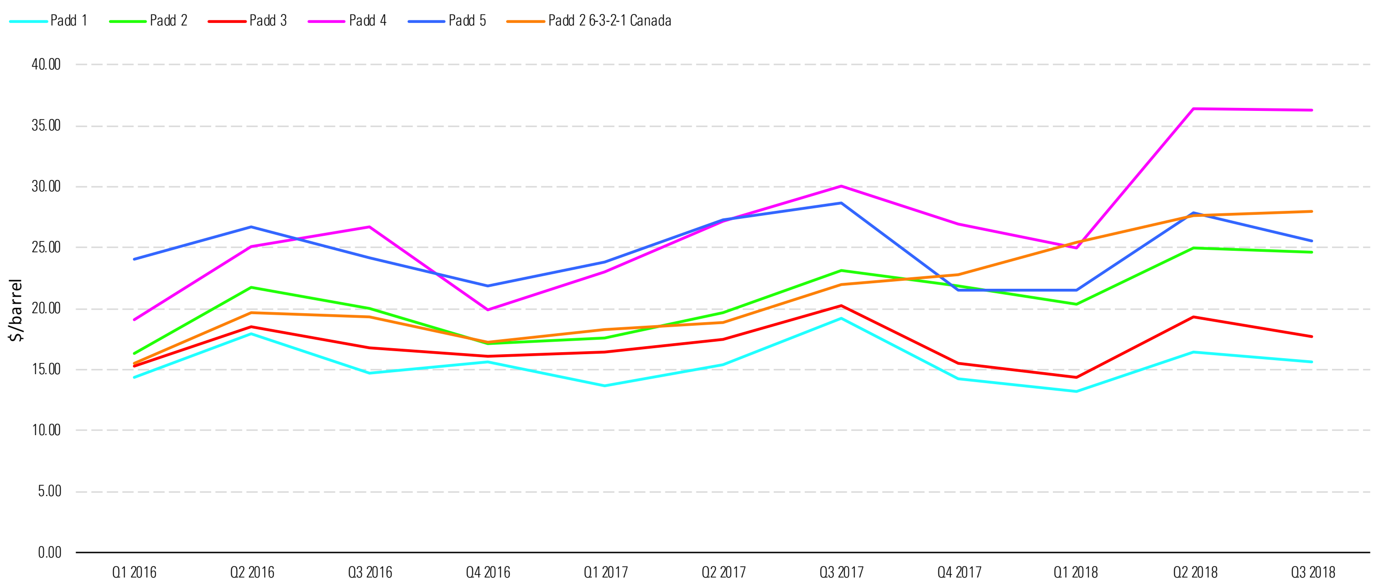
Continuing a Multiyear Streak
Record runs allowed U.S. refiners to continue a multiyear streak of strong margins in 2018 despite rising crude prices during the first three quarters and a weaker fourth quarter after prices tanked in October. While rising crude prices threatened refinery margins, a high Brent premium over domestic benchmark West Texas Intermediate kept feedstock prices for U.S. refiners lower than international rivals. The availability of discounted Canadian crude also produced stellar returns for Midwest, Rockies, and Gulf Coast refiners configured to process heavy crude. As they have for the past few years, export markets soaked up surplus refined product produced by record processing. Product prices only weakened in the fourth quarter when gasoline inventories began to rise. This note highlights major trends and influences in the U.S. refining sector during 2018 and looks forward to 2019.

Record Runs
As we pointed out in last week's review of 2018 crude fundamentals (see Final-Quarter Supply Doubts Mar Record Year), U.S. refiners processed record volumes of crude in 2018. After processing an average 16.57 million barrels a day of crude in 2017, according to the Energy Information Administration, U.S. refiners upped their game again and input an average 16.99 mmb/d in 2018. Increased throughput in 2018 came with minimal additions to operable capacity and represents an annual average 93.1% utilization rate based on weekly EIA data. The 2018 refinery input levels were consistently above the prior 10-year average.

Regional Crack Spreads
Exhibit 1 shows estimated crack spreads calculated by Department of Energy Petroleum Administration for Defense District on a quarterly basis since 2016. The analysis uses price data for product sales and crude costs reported by refiners to the EIA through September 2018. We calculated 3-2-1 crack spreads based on one barrel of crude refined into two-thirds barrel of gasoline and one-third barrel of diesel for each PADD as well as a 6-3-2-1 crack spread for a Midwest PADD 2 refinery processing a barrel of Canadian crude to produce a half barrel of gasoline, one-third barrel of diesel, and one-sixth barrel fuel oil.

The results show that typical refining margins in 2018 through the third quarter were as good as or better than in 2016 and 2017 except in PADD 1. Results were weaker in PADD 1, the Atlantic Coast (cyan line), because refiners had limited access to discounted domestic or Western Canadian crude and therefore typically paid higher feedstock cost for imported barrels while realized product prices were no higher than other regions. The average 2018 PADD 1 crack was $15.06/barrel. In PADD 2, the Midwest region, lower feedstock prices improved 3-2-1 margins (green line) to an average $23.36/barrel and the 6-3-2-1 margin (orange line) to $27.02/barrel when processing Canadian heavy crude. PADD 3 Gulf Coast margins for the 3-2-1 crack were the second lowest in 2018 at $17.13/barrel reflecting the higher cost of crude at the Gulf Coast where refiners compete with exporters. Average Gulf Coast gasoline and diesel prices were also the lowest of any region in 2018 as a result of inventory builds caused by record processing rates. The highest 3-2-1 crack spreads were in the PADD 4 Rockies region where they averaged $32.55/barrel in 2018. The high margins reflected discounted crude costs, the highest average diesel prices in the nation, and gasoline prices second only to PADD 5 (West Coast). We discussed the strong performance of Rockies refineries in a January 2018 outlook (see Low-Tech Rockies Refineries Enjoy High Margins). The 3-2-1 crack averaged $24.96/barrel in PADD 5 during 2018, helped by high gasoline and diesel prices.

Exhibit 1 U.S. Regional 3-2-1 Crack Spreads



Source: Morningstar, EIA.

Refinery margins were lower in the fourth quarter of 2018 as a result of the price slide since early October. We don't have the detailed EIA data yet but using the CME Nymex 3-2-1 crack spread as a proxy for the national average, margins declined by $2.86/barrel between the third and fourth quarters. Although this decline probably varied from region to region, it was caused by gasoline and diesel prices falling further and faster than crude prices in the fourth quarter, with gasoline particularly hard hit after inventories swelled at the end of the summer driving season.

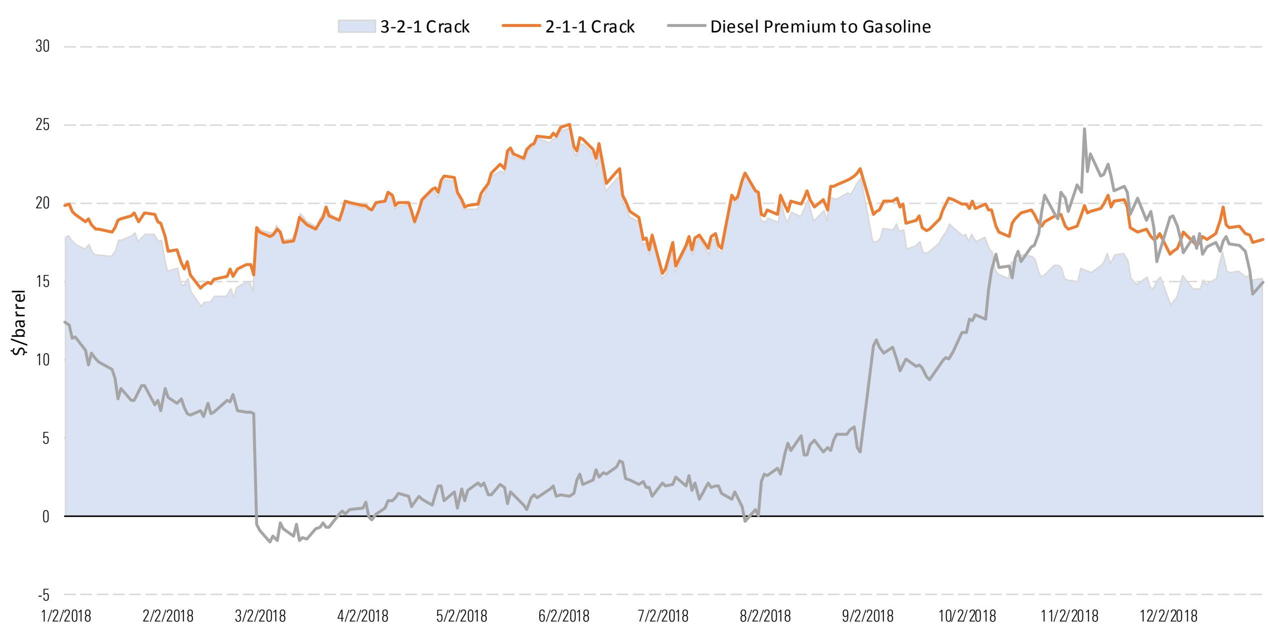
We should note that crack spread estimates represent average values, and some refiners experienced better returns than others last year depending on their crude sources and location. For example, refineries in the West Texas Permian region with access to discounted WTI crude realized windfall margins as a result of pipeline congestion in the producing area (see our September 2018 note Sweethearts of the Permian). Refiners with access to discounted Canadian crude also realized higher-than-average margins.

Higher Diesel Prices

Unusually during 2018, diesel prices were higher than gasoline nearly all year long. CME Nymex ultra-low-sulfur diesel prices were lower than unleaded gasoline on only 19 trading days out of 252 in 2018 (compared with 117 days in 2017) primarily as a result of high export demand and low inventory levels all year (see our May 2018 note Export Demand Empties Distillate Tanks). Exhibit 2 shows the Nymex diesel premium over gasoline (gray line) as well as the 3-2-1 crack spread margin (blue shading) and 2-1-1 crack (orange line). With diesel prices higher most of the year, the 2-1-1 crack (where refiners produce one barrel of diesel for every barrel of gasoline) performed better by an average $1.24/barrel versus the 3-2-1 crack, which reflects refineries configured to produce twice as much gasoline as diesel. Refiners that can tweak their plant to produce more diesel will have seen higher returns in 2018 than those with plants stuck producing more gasoline. Abnormally high seasonal gasoline inventories at the end of 2018 reflected overproduction of gasoline as a byproduct of refiners trying to meet demand for more lucrative diesel.

We expect high diesel prices to continue in 2019 in the runup to the International Maritime Organization's implementation of new regulations for sulfur content in marine fuel specs (more on this topic on the following page).

Exhibit 2 Diesel Premium Over Gasoline and CME Nymex Cracks



Source: Morningstar, CME Group.

RIN Waivers and Ethanol

A looming threat to independent refiners with limited transport fuel-blending facilities was diluted by the Trump administration in 2018. The Environmental Protection Agency, which administers federal renewable fuel standards, issued waivers to 25 small refineries that removed their obligation to purchase ethanol credits known as RINs. The cost of RINs—designed to help administer mandated ethanol blending into gasoline and diesel—increased rapidly at the end of 2017 in the face of a perceived shortage, costing refiners hundreds of millions of dollars. One casualty of high RIN costs was the Philadelphia Energy Solutions refinery, which entered bankruptcy in April 2018 before a restructuring that included writing off RIN debts. The administration's quid pro quo for RIN waivers was EPA removal of a requirement restricting sales of gasoline with 15% ethanol content (E15) during the summer (see our April note Trump Strings Along Farmers and Refiners With Waivers). The E15 ruling increases ethanol market share at the expense of refiners but has yet to be implemented for summer 2019. We expect the initial impact of year-round E15 sales to be slow because of the lack of retail outlets today.

IMO Bunker Regulation

The IMO bunker fuel regulatory change in January 2020 is expected to affect refiners throughout 2019 (see our June 2018 note Fuel Oil Sulfur Spreads Set to Widen Until 2020). A dramatic reduction in heavy sulfur bunker fuel demand (on the order of 2 mmb/d worldwide) and an opposite and greater demand for ultra-low-sulfur distillate can be expected toward the end of 2019. Heavy fuel will either be replaced by more refined and expensive low-sulfur distillate or blended with the same to reduce sulfur content to the new 0.5% limit required after Jan. 1, 2020. Refiners that can upgrade more fuel oil to lighter low-sulfur products will benefit. The value of low-sulfur crudes like shale grades will increase relative to heavy crude. A last-minute scramble by ship owners to install scrubbers that clean ship exhaust, allowing them to continue burning heavy fuel oil and bypass the new regulations, will increase the shelf life of heavy fuel. Either way, there isn't adequate time to upgrade enough refineries or install enough scrubbers before 2020 to resolve the bunker fuel imbalance, resulting in a period of price volatility for fuel oil and distillate markets. That volatility won't be resolved until at least the end of 2020 as refiners, traders, and ship owners navigate compliance with the regulations.

Product Exports

Exports of refined products remained a backbone market for Gulf Coast refiners in 2018 after increasing consistently over the previous seven years. Net exports of gasoline from the Gulf Coast increased 83% from 383 mb/d in 2011 to 703 mb/d in 2017. Net diesel exports also increased 83% over the same period from 649 mb/d to 1,189 mb/d in 2017. In 2018 through October, gasoline exports were up by 133 mb/d and diesel exports were down by 51 mb/d over the same period in 2017. Overall net U.S. gasoline exports between January and October 2018 doubled compared with the same period in 2017 to 186 mb/d while net diesel exports fell 11% to 1,109 mb/d. Although net diesel exports dipped in 2018 by about 122 mb/d, the deficit was somewhat recovered by domestic demand that increased by 84 mb/d year on year between January and October in the Gulf Coast region and by 236 mb/d nationally over the same period, according to EIA monthly demand data.

Marriages

Two notable refinery transactions occurred in 2018. The first was Marathon Petroleum's announced acquisition of Andeavor's West Coast and Midwest refining and downstream assets at the end of April 2018 (see our May 2018 note Has Marathon's Refining Empire Hit a Wall?). The deal combined the second- and fifth-ranked U.S. refiners into the nation's largest crude processor—a new giant on the block—with capacity of over 3 mmb/d. In a smaller transaction announced in November 2018, the 42 mb/d Tacoma, Washington, refinery owned by hedge fund TrailStone and operating as U.S. Oil and Refining was sold to Par Petroleum, which also owns refineries in Hawaii and Wyoming.

For Sale

Three refineries were put on the block by their owners in 2018. The first was the 112 mb/d Pasadena, Texas, refinery owned by Brazilian national company Petrobras. No sale was completed, but Petrobus announced a binding sale agreement in May. Market tittle-tattle mentioned Chevron as an interested party. Petrobras is required to sell the refinery as part of an asset-reduction process. The Philadelphia Energy Solutions refinery mentioned in our RIN discussion was put up for sale by majority owners Carlyle in 2018 but failed to find a buyer and subsequently entered bankruptcy and emerged restructured. A second Philadelphia-area plant, Monroe Energy's Trainer refinery, owned by Delta Air Lines, was actively seeking buyers or investors in September 2018. Both Philadelphia plants performed poorly because of lack of access to cheaper U.S. domestic crudes in PADD 1.

Births

Alberta's North West Redwater Sturgeon refinery opened in Canada during 2018, producing 40 mb/d of diesel, vacuum gas oil, propane, and butane. The Sturgeon plant processes 37.5 mb/d of Alberta government royalty crude for a tolling fee. The newbuild plant received government construction loans, and the project cost doubled to $7.24 billion since it was initially proposed.

Three small refineries are planned for construction in North Dakota (Meridian's Davis refinery) and Texas (MMEX Resources' Pecos refinery and Raven Petroleum's South Texas Energy Complex). All three are still awaiting final investment decisions and construction starts. We detailed these plants in a July note (Can Small Refineries Succeed in North Dakota and Texas?).

Expansion Plans

We noted expansion plans by U.S.-based major oil company ExxonMobil, which is looking to increase throughput at its Baytown and Beaumont plants in the Houston region (see our March 2018 note Exxon Bets on Downstream U.S. Returns).

Outlook 2019

High volatility in crude prices and tumbling gasoline prices during the final quarter of 2018 point to an unsettled business environment for refiners early in 2019 until the market supply/demand picture becomes clearer. We expect the IMO bunker fuel regulation change in January 2020 to dominate the refining agenda in 2019 and have a bullish impact on diesel prices. Gulf Coast refiners need to pay careful attention to possible disruption in the refined product market in Mexico, their largest destination for gasoline and diesel exports. As we discussed in an August note, the July 2 election of Andrés Manuel López Obrador to the presidency has thrown into question the progress of energy market reforms in Mexico (see Slower Mexican Reforms Threaten U.S. Refiners). Overall, though, we believe the IMO changes will underpin another year of strong margins for U.S. refiners in 2019.

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