Energy Indicators

Federal Reserve Bank of Dallas

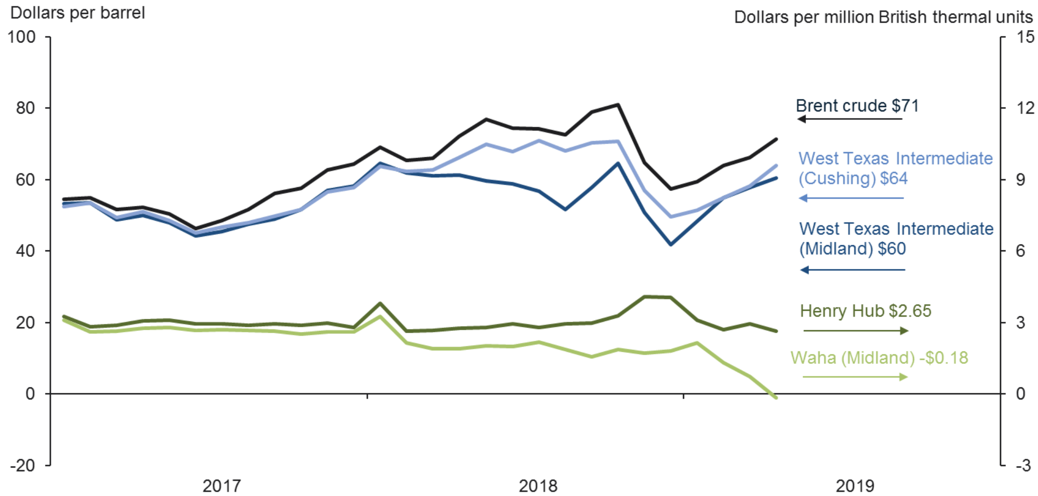
May 2019

While limited takeaway capacity drove Waha natural gas prices below zero in April, oil prices in West Texas continued to rise. The increase in crude prices was supported in part by lower output from OPEC nations and production declines related to sanctions on Iran and Venezuela. U.S. drilling activity continued to erode in April, but the number of monthly well completions remains elevated relative to the start of the year. Employment in oil-price-sensitive support activities for mining continued to slip in March, as did manufacturing employment.

Prices

The price of Brent crude oil rose to average $71 per barrel in April (*Chart 1*). The announcement that import waivers for sanctioned Iranian crude would be allowed to expire in May and the specter of renewed violence potentially disrupting Libya's crude exports put upward pressure on crude prices. This followed earlier supply-related price increases driven by lower production from OPEC nations, sanctions on Venezuela and an eroding rig count in the U.S.

Chart 1
Oil and Natural Gas Prices



NOTE: Prices in labels are average daily closing prices for April.
SOURCES: Energy Information Administration; Bloomberg.

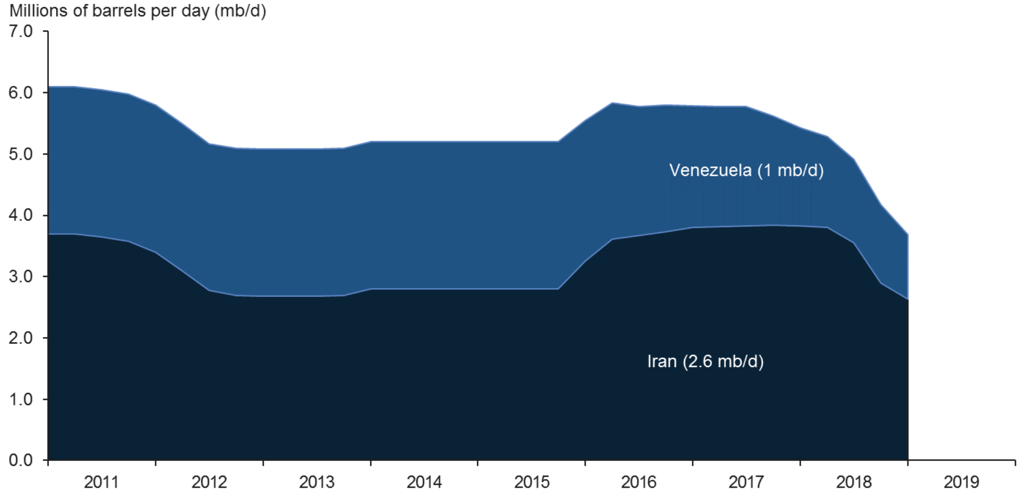
West Texas Intermediate (WTI) crude followed Brent upward, with WTI priced in Cushing (Oklahoma) reaching $64 in April. The spread between the two prices narrowed to $7.64, its lowest level since August 2018. WTI priced in Midland (Texas) increased to $60—$10.76 less than Brent. The Brent–Midland spread increased modestly from March but was nearly half the $21 discount observed in August 2018. Additional pipeline capacity allowed that differential to narrow over the past six months—a trend that could reverse through mid-2019 as Permian production may again strain the limits of existing infrastructure. New pipelines are scheduled to be completed over the next few years, likely allowing the spreads between global and local crudes to narrow.

Henry Hub natural gas prices fell to average $2.65 in April despite a drop in seasonally adjusted U.S. natural gas inventories. However, pipeline shortages contributed to natural gas closing prices in West Texas averaging -18 cents in April. Prices closed as low as -$4.63 on April 3 but recovered to 28 cents on April 30. Rising natural gas production in the Permian is largely a byproduct of rising oil production. Thus, the exceptionally low values for natural gas are not likely to have a significant impact on the amount of gas produced in the region.

Iran and Venezuela Crude Production

Iran produced just over 2.6 million barrels per day (mb/d) of crude in first quarter 2019 based on estimates from the Energy Information Administration (*Chart 2*); this is down from over 3.8 mb/d a year prior. Export markets have been closing off since the intent to impose sanctions was announced in May 2018, and measures of crude production in Iran have dropped since. The Trump administration indicated last month that it intended to allow waivers for importers of Iranian crude to expire in May 2019. These waivers were initially issued in November 2018 when the U.S. unilaterally reimposed sanctions.

Chart 2
Iran and Venzuela Crude Production



NOTE: Data in parentheses are first quarter 2019 forecasts.
SOURCE: Energy Information Administration.

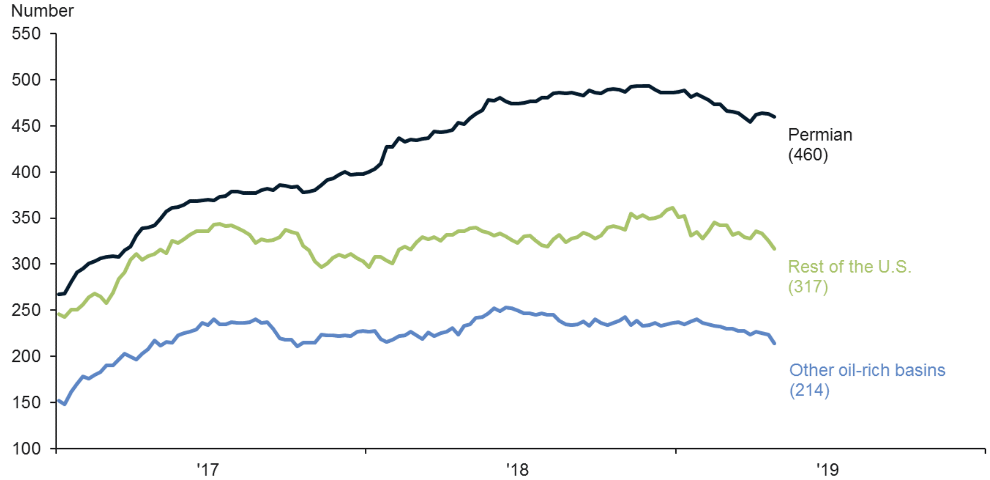
Venezuela's crude production fell to just over 1 mb/d in first quarter 2019 as U.S. sanctions on trade, power outages, years of underinvestment and a lack of maintenance have caused output to erode substantially. March production was an estimated 0.84 mb/d, the lowest level since January 2003.

There is little to indicate that this trend will reverse. Under U.S. policy, third parties using the U.S. payment systems were to cease doing business with the Venezuelan oil company at the end of April, and U.S. oil and gas operators and service firms that remain in Venezuela will have to leave by the end of July.

U.S. Drilling Activity

Rig counts dipped across the U.S. over the past few weeks. The Permian Basin had 460 rigs operating the week of April 26 (*Chart 3*). This was above the 454 at the end of March, which was the lowest Permian rig count since the end of April 2018. The number of rigs in other oil-rich shale basins has collectively drifted down the past 12 months and slipped further to 214 in April 2019. Drilling activity in the rest of the U.S. fell to 317 rigs in April, extending a downward trend that began near the end of 2018.

Chart 3
Rig Counts

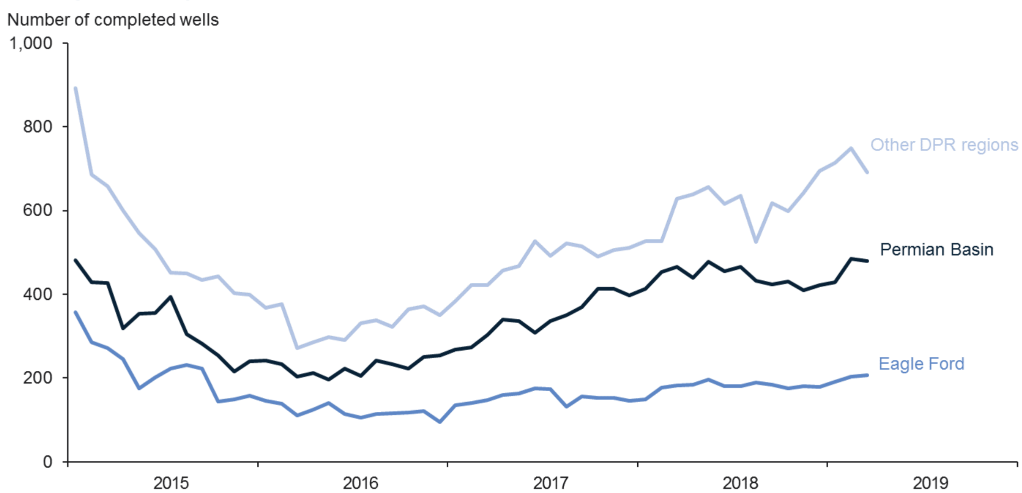


NOTES: "Other oil-rich basins" includes the Cana Woodford, DJ–Niobrara, Eagle Ford and Granite Wash basins. Numbers in parentheses are rig counts for the week ending April 26th.
SOURCES: Baker Hughes.

Well Completions

Well completions—the final stage before bringing a well into production—in the Eagle Ford climbed to 206 in March, while completions in the Permian and elsewhere peaked at 485 and 748 in February, respectively (*Chart 4*). March completions dipped outside of the Eagle Ford but, combined with a lower rig count, were sufficient to curtail further growth in the number of drilled but uncompleted wells (DUCs) in the U.S.

Chart 4
Monthly Well Completions



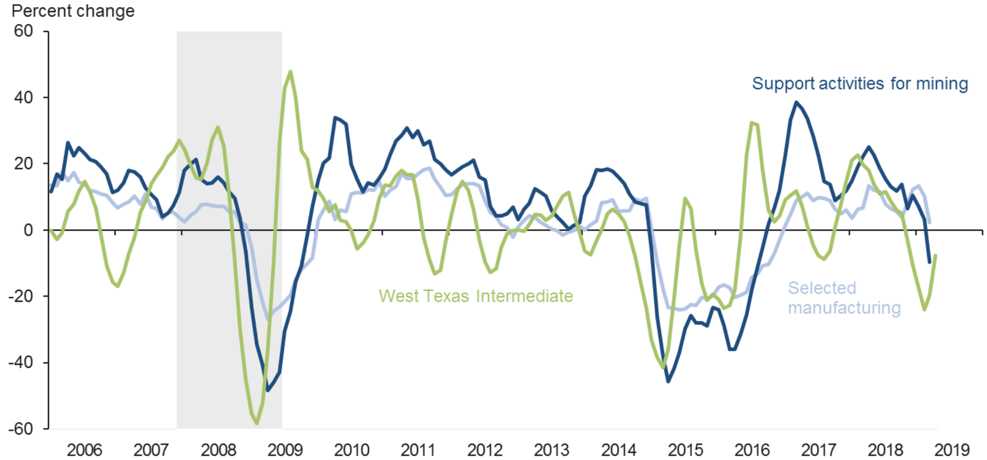
NOTE: Data are seasonally adjusted.
SOURCES: Energy Information Administration; *Drilling Productivity Report* (DPR).

The number of DUCs in inventory rose sharply over the past two years, particularly in the Permian Basin where the "fracklog"—the number of months it would take to complete all the wells in inventory at the current rate of monthly completions—rose as high as 10 months in January. The March fracklog fell to eight months in the Permian, seven months in the Eagle Ford and five months elsewhere in the U.S.

Mining-Related Job Growth Lags Changes in Oil Prices

Where oil prices lead, oilfield activity and related purchases tend to follow as firms respond to price incentives. The nominal growth rate of WTI slowed over 2018 before plunging during fourth quarter 2018, and support activities followed suit (*Chart 5*). Over the three months ending in March, jobs in support activities for mining fell at an annual rate of 9.7 percent (-4,165 jobs), the first decline in the sector since September 2016. Changes in job growth roughly follow variations in oil prices with a lag of three to six months.

Chart 5
Texas Oil and Gas Employment



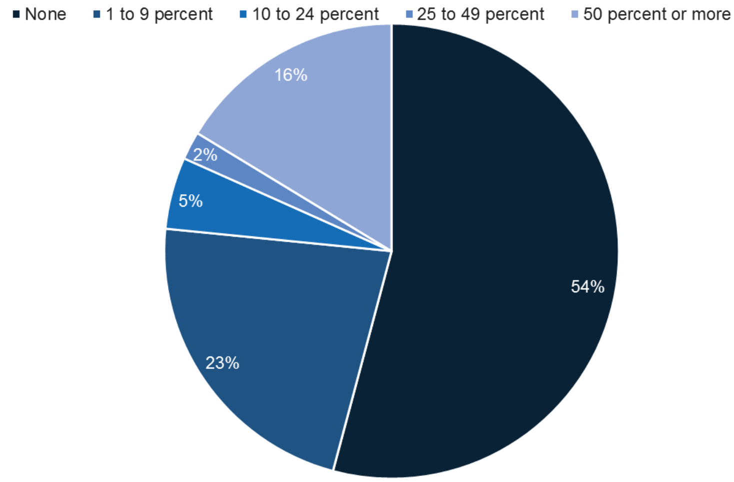
NOTES: Employment data are three-month annual percent changes. Selected manufacturing includes agriculture, construction and mining machinery and fabricated metals manufacturing, excluding architectural and structural metals. West Texas Intermediate is depicted as smoothed four-month percent changes. Shaded area is U.S. recession.
SOURCES: Bureau of Labor Statistics; Energy Information Administration; seasonal and other adjustments by the Dallas Fed.

Despite a diversified manufacturing base in Texas, growth in selected manufacturing job categories—some fabricated metals and agriculture, construction and mining machinery—is similarly correlated with recent fluctuations in oil prices. Selected manufacturing job growth slowed to an annual 2.3 percent (800 jobs) over the three months ending in March.

Oil and Gas Important Part of Texas Manufacturing

The correlation between selected manufacturing employment and oil prices is not unexpected. Nearly half of all manufacturing firms responding to the Texas Business Outlook Survey (TBOS) special questions in April indicated that some of their "revenues came directly from oil and gas-related business," and more than 18 percent of manufacturers indicated that over a quarter of their revenues came from oil and gas (*Chart 6*).

Chart 6
In 2018, What Percentage of Your Firm's Revenues Came Directly from Oil-and-Gas-Related Business?



NOTE: There were 98 responses to this question in the April 2019 Texas Manufacturing Outlook Survey special questions.
SOURCE: Dallas Fed.

More broadly, nearly half of all service sector and retail firms in the survey indicated that some of their revenues came directly from oil and gas. Nearly 9 percent of those firms indicated that over a quarter of their revenue came from oil and gas.

About Energy Indicators

Questions can be addressed to Jesse Thompson at jesse.thompson@dal.frb.org. *Energy Indicators* is released monthly and can be received by signing up for an email alert. For additional energy-related research, please visit the Dallas Fed's energy home page.