

Oil Price Update

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Introduction

Most people have probably noticed that gas prices have started to creep upward since the first of the year. This is a bit unusual as gas prices are usually at their low point during the winter. However, this past year has been anything but normal. Fuel prices are important to not only consumers but also farmers as fuel cost can be a significant expense for farmers. This article examines the current outlook for oil and diesel prices to help producers determine what fuel costs might be throughout the year.

Background

As one might expect, diesel and oil prices are strongly correlated to the oil price. As shown in Figure 1, most changes in oil prices are followed by a corresponding change in gas and diesel prices. The correlation is strongest for oil and gasoline (0.94) and slightly weaker for the relationship between oil and diesel (0.92 when the diesel price is lagged by 3 weeks). Both of these correlations are from 12 years of weekly price data.

Figure 1 also illustrates two other points. First oil prices have traded within two different ranges. These can roughly be divided by pre- and post- fracking. Second, oil prices actually went into negative territory one day last year.

Figure 2 highlights the pre- and post-fracking eras. For 2013 and several previous years, oil was trading near \$100 a barrel. In 2014, the extra oil produced from fracking started to make enough of an impact that oil prices declined to the \$50 to \$60 range. Figure 3 shows how oil production has increased from 5,000 barrels a day in 2006 to over 12,000 barrels a day now. All this extra oil produced in the U.S. has helped cut the gasoline price in half from where it was in 2013.

COVID-19 greatly affected oil and fuel prices this last year as demand for fuels declined. At one point an expiring futures contract caused the futures price to become negative. This article from AgManager discussed that particular situation (<https://www.agmanager.info/production-economics/prices-and-price-forecasts/what's-going-down-oil-prices>).

Analysis and Results

Because of the high correlation between oil prices and both gasoline and diesel prices, oil prices can be used to predict future fuel prices. Figure 4 shows the results of a regression model used to predict fuel prices. The model fits the data very well except for the very low end of oil prices where fuel prices did not decline as much as expected when oil entered the \$20 range last spring.

For predicting the gasoline price, a \$10 increase in the price of oil results in a \$0.22 increase. For predicting the diesel prices, a \$10 increase in the price of oil results in a \$0.24 increase.

Price Predictions for 2021

Because of Covid, the economy is still in a state of flux. Economic activity is near normal levels in some areas while other areas are still lagging. The oil and fracking industry itself had a rough time in 2020 as the initial drop off in demand for oil in the spring of 2020 caused prices to plummet. Much of the fracking industry is heavily leveraged so any oil price decline puts many companies at risk of bankruptcy.

Worldwide demand for oil has picked up some during 2020 but it is still below 2019 levels (see Figure 5). The EIA is forecasting demand to increase throughout 2021 when it may finally reach pre-Covid levels. How quickly demand increases could have a big effect on oil prices. For the U.S. oil industry to fully recover fracking capacity, it may take \$100 a barrel oil. That price possibly certainly exists for 2021 if the economic growth accelerates. \$100 oil likely means the return of \$4 gasoline. The more likely scenario is that prices gradually increase throughout the year. Unless economic growth slows, January is likely to be the low price point for the year.

The EIA forecast as shown in Figure 6 reflects this high degree of uncertainty. They have oil prices varying from \$20 to \$100 as possibilities over the next 18 months. Oil futures don't provide much guidance either as they remain flat.

Historical Oil, Gas, & Diesel Prices



Figure 1. 10-Year Price History of Oil and Fuel Prices

Oil Price (selected years)

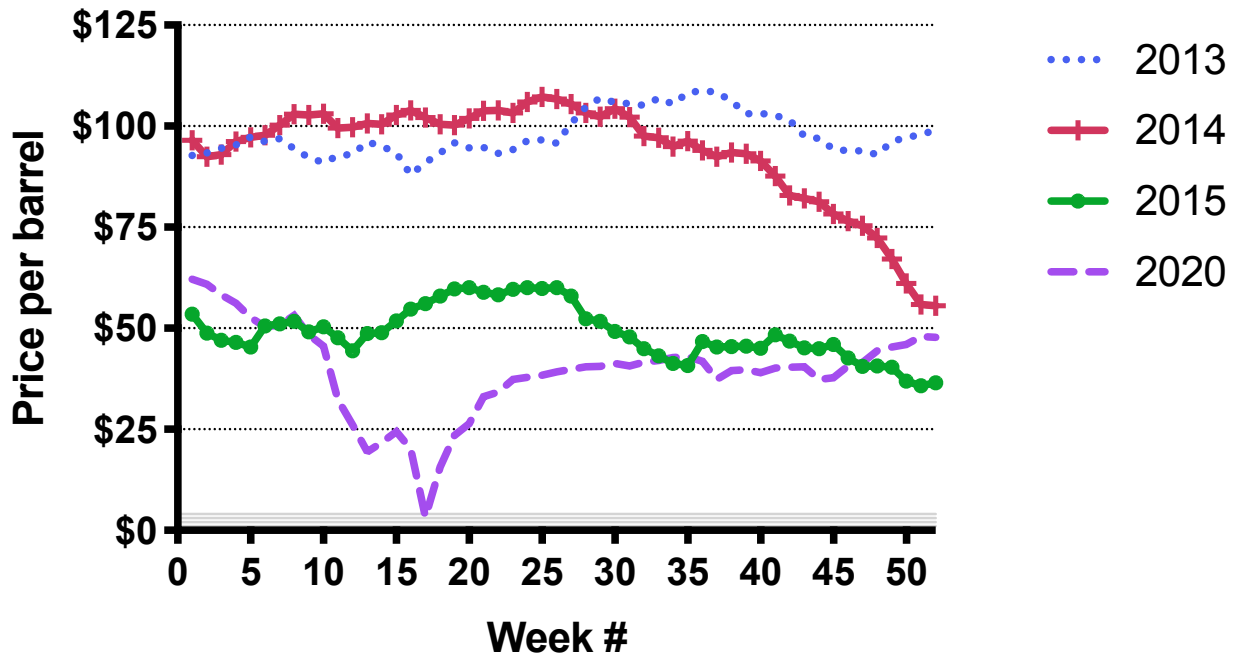
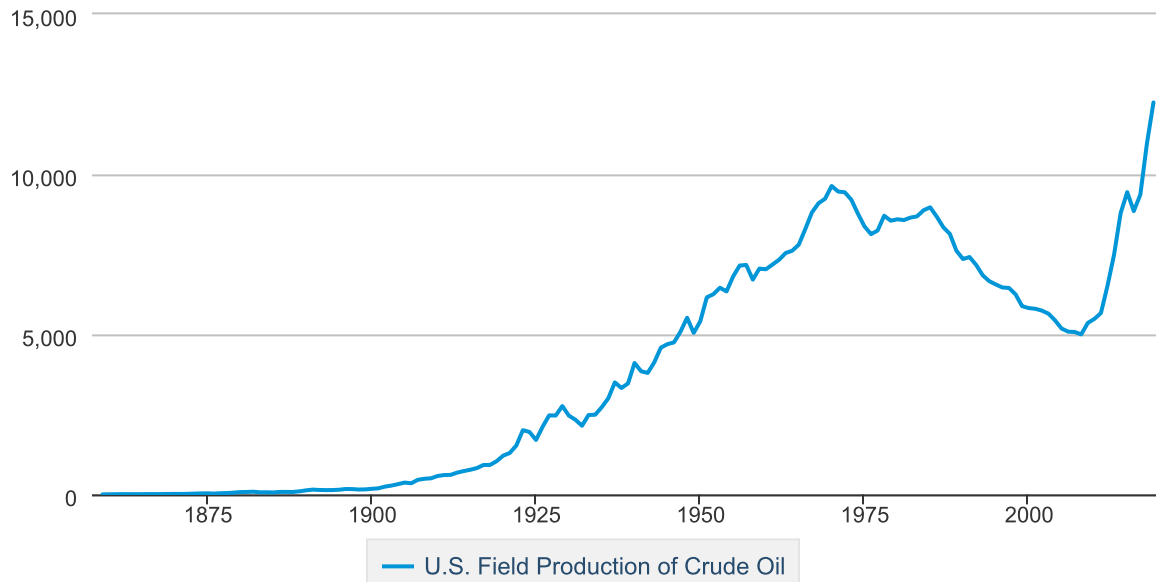


Figure 2. Oil Prices for Selected Years

U.S. Field Production of Crude Oil

Thousand Barrels per Day



 Source: U.S. Energy Information Administration

Figure 3. Historical U.S. Production of Crude Oil

Trend Line for Prices

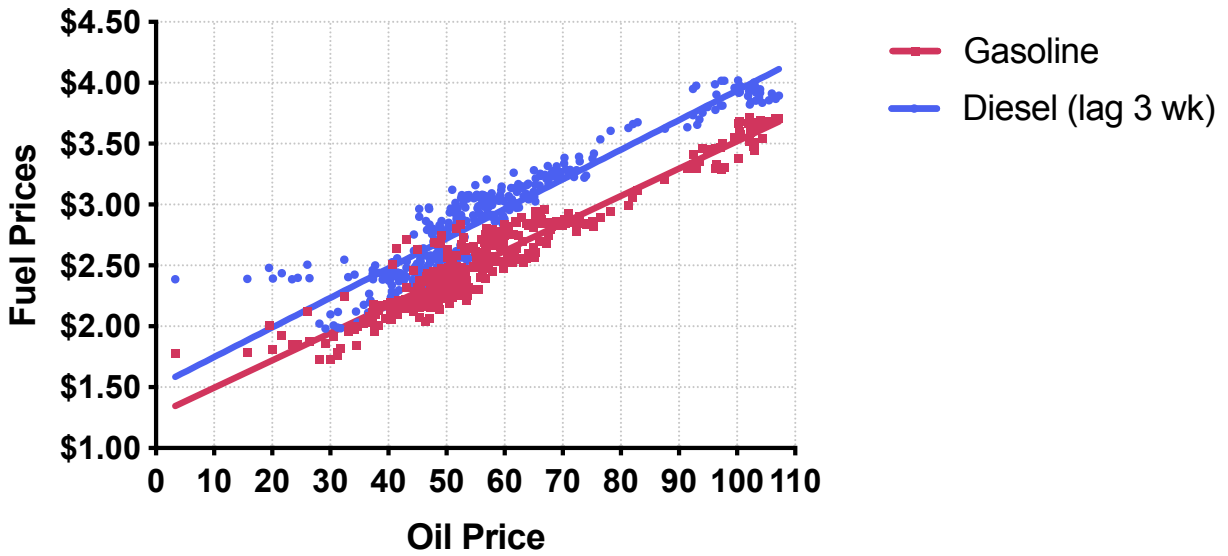
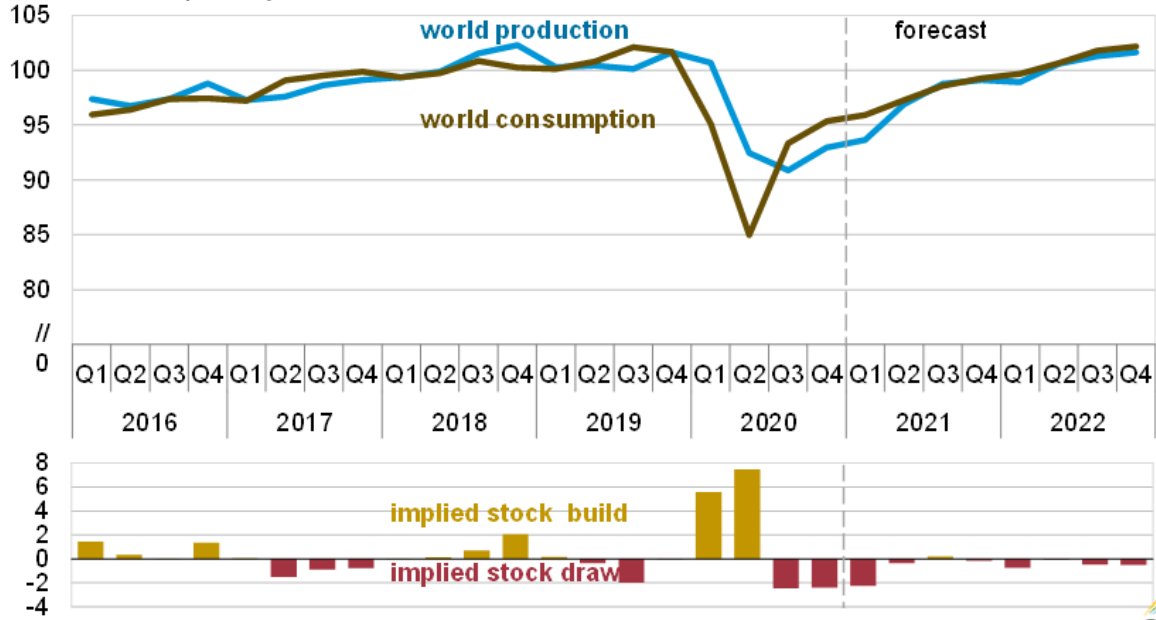


Figure 4. Regression of Diesel and Gas Prices Against Oil Prices

World liquid fuels production and consumption balance
million barrels per day

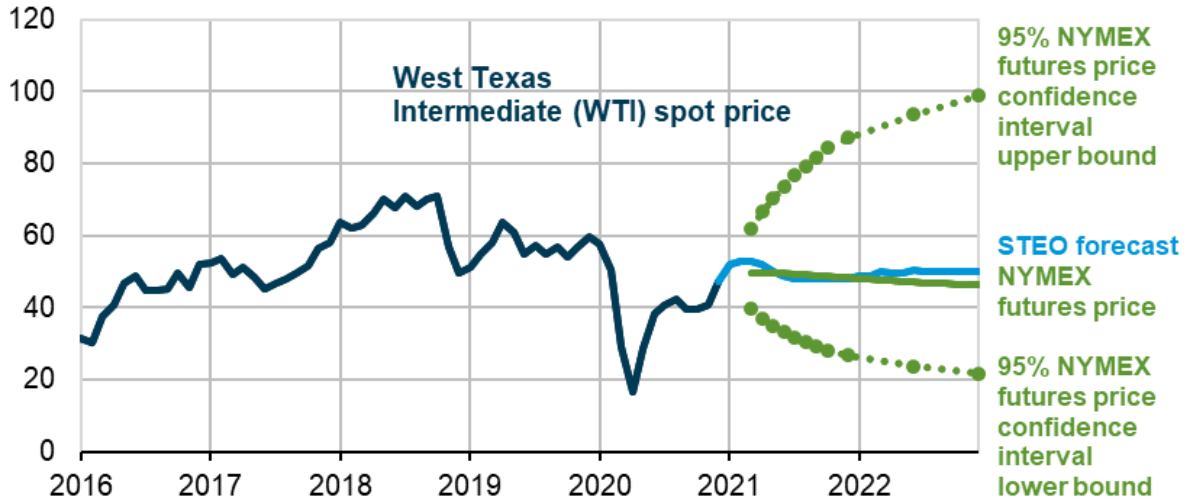


Source: U.S. Energy Information Administration, Short-Term Energy Outlook, January 2021



Figure 5. World Fuel Supply and Demand

West Texas Intermediate (WTI) crude oil price and NYMEX confidence intervals
dollars per barrel



Note: Confidence interval derived from options market information for the five trading days ending Jan 7, 2021. Intervals not calculated for months with sparse trading in near-the-money options contracts.

Sources: U.S. Energy Information Administration, Short-Term Energy Outlook, January 2021, CME Group, and Bloomberg, L.P.



Figure 6. The Energy Information Administration Prediction of Oil Prices

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