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ENERGY

# Increasing U.S. Oil Production During Ukraine Invasion



By ROBERT MCCULLOUGH — March 8, 2022 ⌚ 4 Mins Read

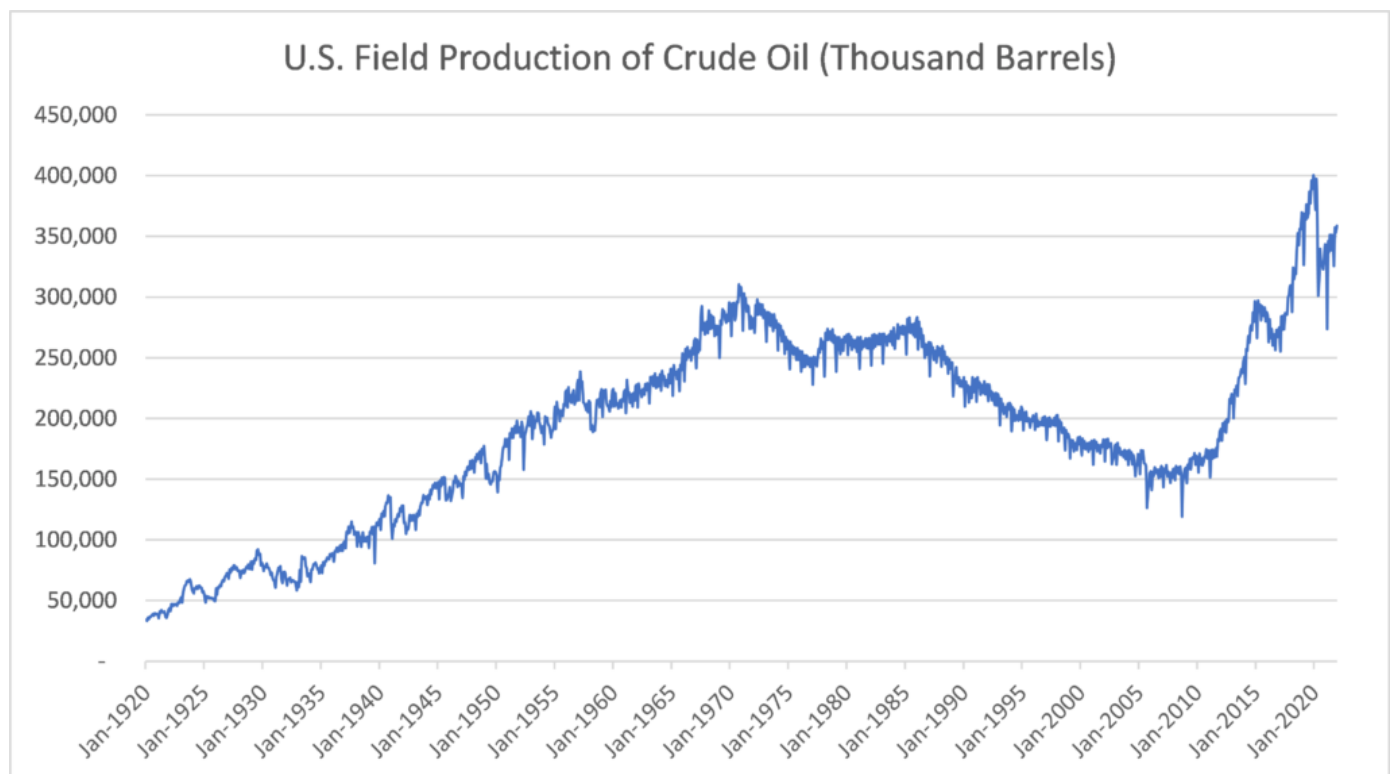


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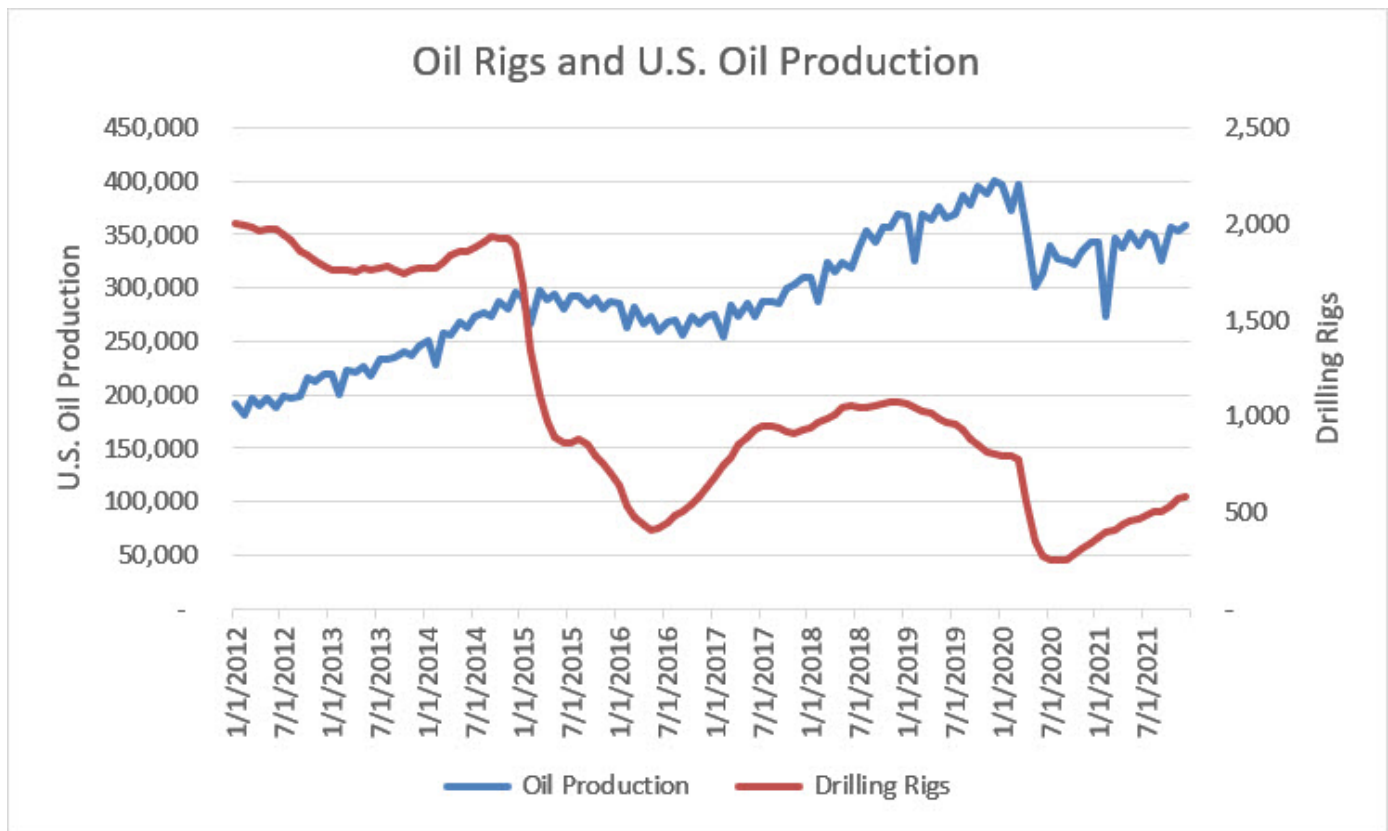
## *How Our Government Can Help and Reasons It Should*

Successful oil sanctions against Russia will cause less harm to the world economy if U.S. oil production ramps up. Unfortunately, the U.S. response to high oil prices has been slow and cautious. To meet needs in Europe, the U.S. may need to consider financing support for independent wildcatters in mid-continental oil fields to accelerate U.S. oil production.

The still-unexplained spike in oil prices on July 3, 2008, had momentous impacts on U.S. oil production. The high prices spurred innovation in three areas – discovery, access, and extraction. Put more colloquially, supercomputers have allowed a high degree of precision in finding the oil, horizontal drilling allows a broader access per well, and fracturing (aka fracking) accelerates oil recovery. The results for the U.S. are striking:



The dynamics of U.S. oil production are roughly based on the number of drilling rigs in operation – particularly over the past decade:



The shift in technology also changed the business considerably. Using older technologies, a virtual forest of wells could occupy an oil field. Today, a single well exploits a large area. This is reflected in the continuing downward slope of the number of drilling rigs even as U.S. oil production has increased.

Mathematicians describe the point on a curve when it changes direction as an inflection point. For drilling rigs, the inflection point is approximately \$60/barrel. Below \$60/barrel, the number of acting drilling rigs falls. When the prices are above \$60/barrel the number of active rigs increases.

We are currently in a period of increase. Since the price of oil passed \$60/barrel one year ago, the number of active rigs has increase by 17 per month. As can be seen from the chart above, if the previous period when drilling increased the rate of change was 31 active rigs per month.

A more scientific approach is to construct a simple mathematical model as a function of the real oil price and a date. The oil price represents the incentive to increase or decrease drilling. The date is a rough representation of the greater efficiency of modern drillings – finding more oil with fewer wells. [The algebra is at the end of this article.]

The area highlighted above in orange reflects a much slower pace of added drilling rigs than in previous high oil price periods.

Given current incentives, we would expect twice as many rigs to be active as we see today. Based on the relationship between active oil rigs and oil production, this would increase U.S. production by 10% – a sizable increment to world oil production.

[Editor's Note: In 2011 **more than 2,000 drilling rigs operated**; as of March 4 the **rig count was 650, up from 403 a year earlier**. This means many idle drilling rigs can be deployed to increase production.]

While market structure in some areas – such as California – have raised market power concerns over the years, oil drilling in U.S. mid-continental basins are highly competitive. The map below illustrates a variety of basins where the constraint may well be financing for smaller companies:

*McCullough Research*

Short-term financing guarantees may well provide needed relief for oil price increases while displacing Russian oil exports.

It should be noted that nothing in this proposal will increase global emissions. Increased oil production will simply reduce Russian oil sales – and Russian oil revenues – as U.S. production provides supplies to European allies.

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\*For algebra fans the formula is: Active Drilling Rigs = Constant + 13.7 Rigs/\$1 increase in the WTI (West Texas Intermediate oil) price – .03 Rigs per day. This simple model is statistically significant at the 99.9% level and explains 71.4% of the explanatory variable.

**Writer**

## Robert McCullough

Robert McCullough, an economist and former electric utility executive, founded McCullough Research in 1985, providing advice and expert testimony about energy markets and regulation. He also teaches energy and regulatory economics at Portland State University in Oregon.



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