

# Fracking and Structural Shifts in Oil Supply

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In this paper, we provide econometric estimates of the supply relation for groupings of U.S. oil producers that differ in their use of hydraulic fracturing. We find that fracking is associated with i) supply responses that are asymmetric with respect to price increases and decreases; ii) a much larger supply response with respect to price rises than is the case for non-fracking producing regions; and iii) a faster speed of adjustment to price changes. Because shale oils accounted for about one-half of U.S. oil output, these attributes of tight oil supply have important implications for the world oil market, particularly if tight oil represents marginal production. We now enumerate these implications: First, price increases cause a rapid increase in tight oil output, making fracking American oil producers a primary beneficiary of price increases. Second, price decreases cause a much smaller decrease in tight oil output; even in a falling price environment, the decrease of tight oil output is limited. These features of post-shale-boom U.S. oil supply are helpful in explaining the impotence of OPEC policy actions intended to i) drown fracking U.S. oil producers in their own oil and , ii) thereby elevate and stabilize the world price of crude oil.

The implications of fracking supply asymmetries on the ineffectiveness of OPEC at managing oil markets are predicated on stable oil demand and tight oil producers accounting for incremental production. When oil demand collapses, as occurred beginning mid-Winter 2020 due to the Covid-19 virus-induced global lockdown, these high-cost producers would be expected to exit the market when oil prices fall below sustainable average variable cost. The supply asymmetries are only relevant when tight oil production through fracking is economically viable. When oil demand eventually returns—and oil prices have already risen substantially from the lows of late April 2020—the assets from bankrupt shale producers, such as Chesapeake Energy and Whiting Petroleum, are likely to once again to be called into production. If and when the tight oil producers with asymmetric supply relations are the incremental producers—the analysis set out in this paper will provide insight about the comparative statics of world oil markets.

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