OIL AND GAS DEVELOPMENT ON PRIVATE LAND: LANDOWNER ABSENTEEISM AND WILLINGNESS TO LEASE

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Overview

From 2005 to 2014, high energy prices and innovation in extraction methods enabled U.S. production of oil and gas to grow by 69 percent, with almost 66 percent of the production occurring on farmland in 2014. The growth generated tens of billions of dollars of additional revenue for owners of oil and gas rights and increased the value of the rights. Most farm operators and non-operator landlords (landowners who do not farm the land themselves) do not own the oil and gas rights associated with their land and are thus unable to receive royalty payments. In the 1,080 counties with oil and gas production in 2014, only 13 percent of non-operator landlords and 10 percent of farm operators reported receiving royalties from gas or oil production.

In the U.S., ownership of oil and gas rights affects the ability of farm operators and landlords to benefit financially from oil and gas development and to shape the terms on which that development occurs. Drilling temporarily takes a few acres of land out of agricultural production, for which the landowner is compensated by the energy company, but farming can continue around the well site. We explore how different ownership structures of the land and associated oil and gas rights affect the willingness of oil and gas right holders to lease out their rights to energy firms. In particular, we estimate how absenteeism and characteristics of the landowner and the farming operation affect the likelihood of leasing out these rights. Farm operators and non-operator landlords likely incur similar benefits (negotiated royalty payments) but different costs from leasing out their oil and gas rights. Our analysis shows that landlords who rent out their land for others to farm are 21 percentage points more likely to lease out their oil and gas rights than landowners who farm their land. This gives an indication that the costs associated with energy development, such as air, light and noise pollution, and truck traffic, that would be incurred only by the landowners farming their own land, are significant enough to deter a sizeable number of farmers from leasing out those rights.

This result is in line with the literature on the local and regional effects of oil and gas development. Development is associated with more air pollution from diesel and road dust emissions from trucks and from well drilling and hydraulic fracturing—including diesel combustion and combustion emissions from natural gas powered compressor stations (Litovitz et al., 2013)—which may play a role in nearby infant health issues (McKenzie et al., 2012; Hill, 2012). On the positive side, Brown et al. (2017) find that each royalty dollar received by county residents created an additional $0.50 in local income, mostly through greater wage income.

Agricultural production and the health of residents are vulnerable to accidental soil and water contamination. Contamination of soil can occur through spills of fluids during well drilling and fracturing and during transport by truck or through wastewater pipelines and failure of well casings and equipment failures and corrosion of pipes and tanks (Pichtel, 2016). The effects of contamination can persist in the soil. Lauer et al. (2016) find elevated radium levels in soils at spill sites of oil and gas wastewater in North Dakota. They also observe elevated levels of contaminants in surface water around spill sites up to 4 years following the spill events.

Research shows that landowner attitudes towards oil and gas development are related to whether the landowner is receiving lease and royalty income (Jacquet, 2012). In an analysis of a survey of West Virginia landowners with completed shale gas wells located on their property, Collins and Nkansah (2015) find that surface owners of split estates had a statistically greater number of reported problems with drilling than did surface owners who also owned their mineral rights and that dissatisfaction was explained by a perception of inadequate compensation.

Methods

We use data from the 2014 Tenure, Ownership, and Transmision of Agricultural Land (TOTAL) survey from USDA's National Agricultural Statistics Service and USDA's Economic Research Service. The TOTAL survey is a national survey of farm operators (including owner-operators and renters) and nonoperator landlords. It provides

the first nationwide data on ownership of oil and gas rights by U.S. farm operators and nonoperator landlords. The survey collected information on farm income, debt, assets, and the timing of leasing and total energy payments received by operators and landlords.

We use two different methods to account for ownership of the oil and gas rights associated with the land. The first is to use the self-reported value of the oil and gas rights collected by the TOTAL survey. The second is to merge the TOTAL survey data with a geologic, county-level dataset on shale depth, which is positively associated with drilling productivity. These two metrics allow us to trim the sample of all farm operators and nonoperator landlords to the subset of these landowners who also own the oil and gas rights associated with their land.

We can then estimate the role of a variety of characteristics of the landowner and the farming operation with the likelihood of leasing out oil and gas rights. These include whether the landlord is a retired farmer and whether the land is inherited, the education and nonfarm income of the landowner, farmland quality, and the commodity or livestock produced on the operation.

Results

We find that landlords outside of the county in which rented land is located are more likely to sell or lease oil and gas rights, an effect that increases with greater remoteness. In addition, higher quality land is less likely to be associated with exercised oil and gas rights. Nonshare rental agreements are also less likely to be affiliated with exercising oil and gas rights.

Conclusions

Living close to potential drilling operations reduces the willingness of oil and gas rights holders to exercise these rights, indicating that costs of drilling to comfort, health, and the environment are nonnegligible. Exploring oil and gas rights holders' response to the prospect of oil and gas development on their land is important, since oil and gas production is expected to grow by 23 percent from 2016 to 2025. Non-operator landlords (who rent out their land for others to farm) and farm operators likely incur similar benefits (royalty payments) but different costs from leasing out their oil and gas rights and allowing drilling to occur. The 21 percentge point difference in the willingness to allow for oil and gas development between non-operator landlorsd and farm operators is an indication that people living on the property subject to drilling may not be adequately compensated by energy firms for the disruption of drilling and subsequent oil and gas production.

Note

The findings and conclusions in this publication are those of the authors and should not be construed to represent any official U.S. Department of Agriculture or U.S. Government determination or policy. This research was supported in part by the intramural research program of the U.S. Department of Agriculture, Economic Research Service.

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