

PEER INFORMATION EFFECTS IN CONTRACT NEGOTIATIONS: EVIDENCE FROM OIL AND GAS LEASES

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Overview

An essential element of an oil and gas company's operations is the right to explore and extract minerals, which requires companies to sign leases with mineral rights owners. In a competitive and volatile energy market we expect the terms of these leases to be determined by at least three factors:

1. supply factors, i.e., the geological and productive potential of the acreage being leased;
2. market factors, i.e., the revenue potential dictated by anticipated oil and natural gas prices, as well as the level of competition among energy producers; and
3. information factors, on which this study focuses.

Information factors come in two forms: market and non-market information. *Market information* reflects the state of the market for leases, including appropriate contract terms. As mineral rights owners (i.e., lessors) observe ongoing leasing activity in their community, they form more precise estimates about the value of their own mineral rights. Entering lease negotiations with more precise information is expected to yield negotiation outcomes that better reflect fair or reasonable terms and compensation for lessors. This in return yields more favorable terms for informed lessors than for uninformed (or unsophisticated) lessors.

Non-market information reflects individual or subjective exposure to local drilling activities among lessors. For instance, individuals living near existing drilling pads are better aware of potential environmental consequences of drilling activities, and are more likely to ask for compensation with regards to any associated negative externalities during their lease negotiations.

In our project, we isolate and identify these information effects to estimate their magnitude. Understanding how information filters through the negotiations process is important for interpreting the welfare effects of energy contracts (Hendricks et al., 1993) and understanding the cost side of energy company operations (Kellogg, 2014). We focus on two channels through which information can affect the outcomes of lease negotiations: local information flows and idiosyncratic exposure to industry activities. Because geographic proximity facilitates information flows, we expect that lessors who live in the same community ("insiders") will be better informed about current market conditions (i.e., outcomes of recent lease negotiations) than lessors who live outside that community ("outsiders"). Better-informed parties should be able to negotiate more favorable lease terms. At the same time, individuals residing near an existing well are more likely to be exposed to environmental and auditory effects of local drilling activity. Presence of such negative externalities makes these "exposed" individuals more likely to negotiate stricter (i.e., more favorable) lease development terms. Our two-stage identification strategy exploits geographic variation in lessor locations while controlling for the location of leased acreage:

- Suppose we observe two leased properties in close geographic proximity but with one of the two lessors (i.e., owners of mineral rights associated with these properties) residing outside the community. The outsider will have limited access to information about the market for leases within the community and we expect this to be reflected in the terms included in the outsider's lease. We hypothesize that better access to information will allow an insider to negotiate higher bonuses, higher royalty rates, shorter primary lease terms, and more favorable contract clauses.
- However, these observed differences between insider-contracts and outsider-contracts cannot be attributed only to market information. This is because the outsider may also have less prior exposure to drilling activity (when, e.g., living in an outside community with very little oil and gas production). Idiosyncratic non-market information will therefore also play a role in contract outcomes. We isolate the non-market component by observing two different insiders with only one residing near an existing well. We expect both insiders to have the same access to market information but different perceptions about the effects of drilling activity due to their differing exposures. All else equal, the difference in lease terms between these two insiders will then reflect the non-market information component, which should roughly amount to compensation required for any associated negative externalities of mineral development.

Being able to isolate these different informational asymmetries will give us a better understanding of how information affects relative bargaining positions of energy market players and negotiation outcomes. Significant

increase in leasing activity that led to the U.S. shale boom and the subsequent bust in leasing activity spurred by the 2014 oil price collapse provides us with a well-packaged natural experiment for testing our hypotheses.

Methods

We use optical character recognition (OCR) and text parsing methods to extract the specific variables of interest in each contract, i.e., bonus payments, royalty rates, and primary terms. We geocode physical locations of lessors, lessees, and leased properties to calculate physical distances of lessors from their respective leased properties as well as the closest active well (as measure of exposure) at the time the lease is signed.

Utilizing recent developments in textual and semantic analysis allows us to identify differences in lease terms and conditions (other than bonus payments, royalty rates, and primary terms).¹ We apply topic models (Latent Dirichlet Allocation or LDA (Blei et al., 2003; Griffiths and Steyvers, 2004)) that have been used to identify themes or topics in written texts in various fields of law, economics, and finance (e.g., Livermore et al., 2015; Ganglmair and Wardlaw, 2015; Hoberg and Lewis, 2015). This helps us classify clauses and identify those that are more or less favorable to the lessor.

Results

Results are forthcoming.

Conclusions

In this research we focus on identifying the value of information in oil and gas contract negotiations. Informational asymmetries have an important impact on the relative bargaining positions of energy market players and negotiations outcomes. Being able to identify these impacts and quantify the value of gained information will help us to understand how to get to more efficient negotiation processes and outcomes and shed light on a variety of important questions in the field of negotiation and contract economics.

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¹ Recent work in economics includes Gentzkow and Shapiro (2010) or Kosnik (2014) who studies terms in U.S. hydroelectric dam licenses. Hoberg and Phillips (2010), Hoberg et al. (2014), or Loughran and McDonald (2014) use textual analyses in finance, and Livermore et al. (2015) studies U.S. Supreme Court decision.