

Abstract

Trade-offs and Implications of Two-stage versus One-stage Unconventional E&P Investment Strategies: A case study of the Barnett Play

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The present paper analyzes first theoretically and then empirically which unconventional investment strategy has a superior profitability, given a uniform geology. In particular, as shown in Figure 1, it compares between two-stage investment (single with infill drilling technologies) and one-stage investment (cluster drilling technology).

The theoretical model lays the foundation for empirical analysis. Net Present Value (NPV) calculation is used to measure the attractiveness for each investment strategy. The empirical analysis comprises two parts – the first part attempts to unlock the mystery of risks involved in extracting unconventional resources. The second part looks at various examples from dry, wet and oily parts of the Barnett play to find out an unbiased message regarding the superiority of investment strategy. Actual completion and production data were used. Recovery profile and revenue profile are emphasized for trade-off discussion between the two investment strategies.

It is often overlooked in the economic evaluation of unconventional investments the importance of learning curve in measuring the risk associated with productions. As unconventional resources are extremely heterogenous in geological attributes, a special attention must be paid to the individual acreage in question when addressing risks for discounting factor in NPV calculation. The empirical analysis has revealed that the risks do not necessarily decrease with time due to technological changes and/or lack of concentrated efforts to acquire better understanding of the geology. Other important factors that can affect the profitability of an investment include prices and extent of cost-savings by technological changes.

Little attention has been paid by the academia on the economics of unconventional resource investment strategies. The present research has strengthened the collective understanding of unconventional resource economics by suggesting a roadmap for unconventional resource producers to better assess their investment strategies.



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