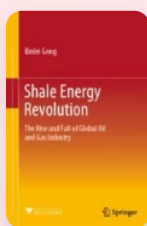


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Different Behaviors in Natural Gas Production Between National and Private Oil Companies: Economics-Driven or Environment-Driven?



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Shale Energy Revolution



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Abstract

This chapter investigates firm-level efficiency in the petroleum industry during the period 2009–2015. A Jackknife model averaging method and two stochastic frontier models are utilized to estimate the input-output relation more accurately. The derived efficiency is then decomposed to predict the effect of various efficiency determinants with an emphasis on gas ratio and ownership. A significantly negative effect of natural gas ratio (in production portfolio) on efficiency is found for both National Oil Companies (NOCs) and privately-owned International Oil Companies (IOCs). This finding implies that the decline in natural

gas ratio for IOCs is economics-driven, and the incline in gas ratio for NOCs is environment-driven. Therefore, the environmental objective is the NOCs' third non-commercial objective, alongside subsidizing below-market energy prices and offering excessive employment, as found in the literature. Governments may consider the transfer of subsidies from low energy prices to clean energy promotion, which leads to energy saving and emissions reduction.

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Notes

1. Popular criteria include, but not limited to, the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the Focused information criterion (FIC).

References

Akerberg D.A., Caves K., and Frazer G. Identification Properties of Recent Production Function Estimators. *Econometrica*. 2015, 83 (6):2411-2451.

[Google Scholar](#)

Aigner D., Lovell C.A., and Schmidt P. Formulation and Estimation of Stochastic Frontier Production Function Models. *Journal of Econometrics*. 1977, 6 (1):21-37.

[Google Scholar](#)

Al-Obaidan A.M., and Scully G.W. Efficiency Differences between Private and State-Owned Enterprises in the International Petroleum Industry. *Applied Economics*. 1992, 24 (2):237-246.

[Google Scholar](#)

Amsler C., Prokhorov A., and Schmidt P. Endogeneity in Stochastic Frontier Models. *Journal of Econometrics*. 2016, 190 (2):280-288.

[Google Scholar](#)

Battese G.E., and Coelli T.J. Frontier Production Functions, Technical Efficiency

and Panel Data: With Application to Paddy Farmers in India: Springer Netherlands, 1992.

[Google Scholar](#)

Bertoldi P., Rezessy S., and Vine E. Energy Service Companies in European Countries: Current Status and a Strategy to Foster Their Development. *Energy Policy*. 2006, 34 (14):1818–1832.

[Google Scholar](#)

Bilgin M. New Prospects in the Political Economy of Inner-Caspian Hydrocarbons and Western Energy Corridor through Turkey. *Energy Policy*. 2007, 35 (12):6383–6394.

[Google Scholar](#)

Buckland S.T., Burnham K.P., and Augustin N.H. Model Selection: An Integral Part of Inference. *Biometrics*. 1997, 53 (2):603–618.

[Google Scholar](#)

Conway J.E. The Risk Is in the Relationship (Not the Country): Political Risk Management in the Uranium Industry in Kazakhstan. *Energy Policy*. 2013, 56:201–209.

[Google Scholar](#)

Cornwell C., Schmidt P., and Sickles R.C. Production Frontiers with Cross-Sectional and Time-Series Variation in Efficiency Levels. *Journal of Econometrics*. 1990, 46 (1):185–200.

[Google Scholar](#)

Eller S.L., Hartley P.R., and Medlock K.B. Empirical Evidence on the Operational

Efficiency of National Oil Companies. *Empirical Economics*. 2011, 40 (3):623–643.

[Google Scholar](#)

Fontaine G. The Effects of Governance Modes on the Energy Matrix of Andean Countries. *Energy Policy*. 2011, 39 (5):2888–2898.

[Google Scholar](#)

Gong B. Multi-Dimensional Interactions in the Oilfield Market: A Jackknife Model Averaging Approach of Spatial Productivity Analysis (Forthcoming). *Energy Economics*. 2017.

[Google Scholar](#)

Gong B. The Shale Technical Revolution—Cheer or Fear? Impact Analysis on Efficiency in the Global Oilfield Service Market. *Energy Policy*. 2018, 112 (1):162–172.

[Google Scholar](#)

Hansen B.E., and Racine J.S. Jackknife Model Averaging. *Journal of Econometrics*. 2012, 167 (1):38–46.

[Google Scholar](#)

Hartley P., and Medlock K.B. A Model of the Operation and Development of a National Oil Company. *Energy Economics*. 2008, 30 (5):2459–2485.

[Google Scholar](#)

Hartley P.R., and Medlock III K.B. Changes in the Operational Efficiency of National Oil Companies. *The Energy Journal*. 2013, 34 (2):27–57.

[Google Scholar](#)

Hawdon D. Efficiency, Performance and Regulation of the International Gas Industry—a Bootstrap Dea Approach. *Energy Policy*. 2003, 31 (11):1167–1178.

[Google Scholar](#)

Hekkert M.P., Hendriks F.H.J.F., Faaij A.P.C., and Neelis M.L. Natural Gas as an Alternative to Crude Oil in Automotive Fuel Chains Well-to-Wheel Analysis and Transition Strategy Development. *Energy Policy*. 2005, 33 (5):579–594.

[Google Scholar](#)

Jacobsen H.K., Fristrup P., and Munksgaard J. Integrated Energy Markets and Varying Degrees of Liberalisation: Price Links, Bundled Sales and Chp Production Exemplified by Northern European Experiences. *Energy Policy*. 2006, 34 (18):3527–3537.

[Google Scholar](#)

Kneip A., Sickles R.C., and Song W. A New Panel Data Treatment for Heterogeneity in Time Trends. *Econometric Theory*. 2012, 28 (3):590–628.

[Google Scholar](#)

Levinsohn J., and Petrin A. Estimating Production Functions Using Inputs to Control for Unobservables. *The Review of Economic Studies*. 2003, 70 (2):317–341.

[Google Scholar](#)

Managi S., Opaluch J.J., Jin D., and Grigalunas T.A. Stochastic Frontier Analysis of Total Factor Productivity in the Offshore Oil and Gas Industry. *Ecological Economics*. 2006, 60 (1):204–215.

[Google Scholar](#)

Managi S., Opaluch J.J., Jin D., and Grigalunas T.A. Technological Change and Depletion in Offshore Oil and Gas. *Journal of Environmental Economics and Management*. 2004, 47 (2):388–409.

[Google Scholar](#)

Meeusen W., and Van den Broeck J. Efficiency Estimation from Cobb-Douglas Production Functions with Composed Error. *International Economic Review*. 1977, 18 (2):435–444.

[Google Scholar](#)

Olley G.S., and Pakes A. The Dynamics of Productivity in the Telecommunications Equipment Industry. *Econometrica*. 1996, 64 (6):1263–1297.

[Google Scholar](#)

Robinson A.P., Blythe P.T., Bell M.C., Hübner Y., and Hill G.A. Analysis of Electric Vehicle Driver Recharging Demand Profiles and Subsequent Impacts on the Carbon Content of Electric Vehicle Trips. *Energy Policy*. 2013, 61 (8):337–348.

[Google Scholar](#)

Schmidt P., and Sickles R.C. Production Frontiers and Panel Data. *Journal of Business and Economic Statistics*. 1984, 2 (4):367–374.

[Google Scholar](#)

Seeto D.Q., Woo C.-K., and Horowitz I. Finessing the Unintended Outcomes of Price-Cap Adjustments: An Electric Utility Multi-Product Perspective. *Energy Policy*. 2001, 29 (13):1111–1118.

[Google Scholar](#)

Shang C. 2015. “Essays on the Use of Duality, Robust Empirical Methods, Panel

Treatments, and Model Averaging with Applications to Housing Price Index Construction and World Productivity Growth.” Rice University.

[Google Scholar](#)

Simsek H.A., and Simsek N. Recent Incentives for Renewable Energy in Turkey. Energy Policy. 2013, 63 (4):521–530.

[Google Scholar](#)

Thompson R.G., Dharmapala P., Rothenberg L.J., and Thrall R.M. Dea/Ar Efficiency and Profitability of 14 Major Oil Companies in U.S. Exploration and Production. Computers and Operations Research. 1996, 23 (4):357–373.

[Google Scholar](#)

Wei M., Patadia S., and Kammen D.M. Putting Renewables and Energy Efficiency to Work: How Many Jobs Can the Clean Energy Industry Generate in the Us? Energy Policy. 2010, 38 (2):919–931.

[Google Scholar](#)

Wolf C. Does Ownership Matter? The Performance and Efficiency of State Oil Vs. Private Oil (1987–2006). Energy Policy. 2009, 37 (7):2642–2652.

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