Rural Wealth Creation and Emerging Energy Industries

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The views expressed are those of the presenter and do not reflect the positions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.
Background

- Rural economic development is a perennial challenge in the U.S.

- Decline in farm population lead to need for alternative sources of employment and income (Irwin et al., 2010)

- Earlier strategies depended upon (Deller and Goetz, 2009)
  - natural resource uses, e.g., mining, forestry
  - recruitment of manufacturing sectors, e.g. clusters
  - picking “winners” vs. “losers” (Partridge, 2013)

- Attracting people to rural areas (Pender, Marre, Reeder, 2012)
  - Tourists, retirees, commuters, the creative class, entrepreneurs
  - Based on idea that jobs follow people rather than people always follow jobs
Recent Work


• “Private Royalties from U.S. Onshore Oil and Gas Production: Their Size, Geographic Distribution, and Determinants.” with Tim Fitzgerald and Jeremy Weber. In progress.
Wealth Creation Framework

Federal, State, and Local Government Policies

New Technology (horizontal drilling, fracking, wind turbine technology)

Energy Markets and Prices

New Energy Development (oil & gas, wind, etc.)

Energy Payments (leases and royalties)

Ownership of Land and Mineral Rights

Landowners’ Income

Consumption, Savings, Investment

Landowners’ Wealth

Energy Demand & Supply Drivers (population, income, exchange rates, OPEC policies, etc.)

Local wealth
- Natural resources
- Natural amenities
- Human capital
- Physical capital/Infrastructure
- Financial capital
- Social capital

Local Property Values
Context plays an important role

- Economic potential of rural economic development strategies depends on:
  - Temporal and spatial economic, institutional, and policy context

- Recent boom in oil and natural gas production
  - Combination of technology, geography, and prices
  - State and local governments have encouraged or slowed/stopped development (e.g., Oklahoma vs. New York)
    - Taxes on production, tax breaks, bans on drilling, etc.

- Locals pursuing energy resources are vulnerable to changes in contextual factors
Local endowments and interactions of wealth

- Local endowments of multiple types of wealth and their interactions affect:
  - feasibility and desirability of particular strategies

- Local endowments of oil and gas
  - Also requires local infrastructure
  - Water for hydraulic fracturing
  - Treatment and storage options for waste

- Residents and institutions have strong incentive to ensure part of private gain from using public infrastructure and natural resources supports infrastructure maintenance

- New tax revenue from energy development may enable public investment in other kinds of assets
  - Improvement to schools, training programs, parks, etc.
Local ownership of assets affects outcomes

- Most initial labor related to oil and gas development comes from outside of the area.

- Over time, local firms and residents tend to supply a larger share of materials and labor (Marcellus Shale Education & Training Center, 2011).

- Weber (2012) found that for counties in Colorado, Texas, and Wyoming with each $1 million in natural gas production generated $91k in local wage and salary income.

- Local residents are more likely to spend or invest locally than out-of-state workers and business owners.

- Local ownership of oil and gas mineral rights varies substantially across the United States (Fitzgerald, 2014).
Environmental and social outcomes

- Negative environmental or social outcomes of some economic strategies may reduce net benefits and undermine stability
- Poorly cemented wells can pose a water quality and health hazard (Ohio Department of Natural Resources, 2008; Thyne, 2008)
- Capture of flowback (Lustgarten, 2009)
- Deep underground disposal of flowback linked to earthquakes (Fischetti, 2012)
- Reduced air quality (Kargboo et al., 2010; Meng, 2015)
- Social tension between participating and non-participating residents
- Need for local capacity to plan and implement strategies to address these and other concerns
Feedback effects on different types of wealth

- Long-term effects from unconventional drilling are unknown.

- Broader literature has highlighted bust effects can be larger than boom in the case of coal mining (Black et al. 2005).

- Long-lasting positive effects have been documented in oil-producing counties (Michaels 2010).

- May encourage dropping out of secondary education (Cascio and Narayan, 2015).

- Changes to natural amenities and overall quality of life can make an area less attractive.
Oil & Gas Royalty Income Example

• Leasing data are from DrillingInfo
  • nearly 160k private leases from around the country

• Estimate that six major plays generated $39 billion in royalties in 2014

• In more rural areas, royalties rival
  • Government transfer payments
  • Federal farm commodity programs

• Percentage of mineral rights held by county residences varies substantially across shale plays, 12 to 55 percent
Shale Plays

Source: Energy Information Agency
Value of Production & Royalty Rates by Play

Source: Authors’ calculations
Local Ownership & Local Value of Production

Source: Authors’ calculations
## Royalty Income Estimates, 2014

<table>
<thead>
<tr>
<th>Shale Play</th>
<th>Bakken</th>
<th>Eagle Ford</th>
<th>Haynesville</th>
<th>Marcellus</th>
<th>Niobrara</th>
<th>Permian</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Royalty income ( $ per capita)</strong></td>
<td>27,414</td>
<td>12,007</td>
<td>1,811</td>
<td>431</td>
<td>739</td>
<td>9,768</td>
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<tr>
<td><strong>Local royalty income ( $ per capita)</strong></td>
<td>4,148</td>
<td>2,942</td>
<td>398</td>
<td>236</td>
<td>224</td>
<td>1,161</td>
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<tr>
<td><strong>Govt. transfers ( $ per capita)</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>6,455</td>
<td>6,712</td>
<td>8,345</td>
<td>9,146</td>
<td>5,652</td>
<td>6,997</td>
</tr>
<tr>
<td><strong>Federal farm payments ( $ per capita)</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td>587</td>
<td>33</td>
<td>10</td>
<td>9</td>
<td>44</td>
<td>186</td>
</tr>
</tbody>
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<sup>1</sup> BEA REIS; <sup>2</sup> 2012 Census of Agriculture

*Source: Authors’ calculations*
Conclusion

• Context plays a key role in economic development

• Local ownership of assets has large influence on overall effect of natural resource extraction

• Long-term effects from unconventional drilling are unknown

• Greater need for research on environmental and quality of life effects
  • Limited data is a significant challenge

• Need for local capacity to plan and implement strategies to address these and other concerns