Producing Energy, Protecting Food

DOES SHALE ENERGY DEVELOPMENT AFFECT RETAIL FOOD OPTIONS IN RURAL COMMUNITIES?

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Poll:
How familiar are you with the concept of healthy food access?

Healthy Food Access

The physical and economic ability to obtain culturally acceptable and nutritionally adequate food
Retail Food Environment

No Car and No Supermarket Store Within a Mile

The impact of food environments

1. Diet-related illnesses (e.g., obesity and diabetes) may be more pronounced in some poor and rural American communities because there is limited access to affordable and nutritious foods
2. Poor food environments matter more than healthy food environments
Retail follows people.

AND RETAIL FOLLOWS MONEY.

Shale Energy Development

• US passed Saudi Arabia in oil production
• Oil and gas employment increased 86% between 2006-2015
• Over 750 US counties sit above shale oil and gas reserves

Poll:
Do you work in an area impacted by shale energy development?
Two Waves of Employment

**Employment**
1. Drilling: about 13 jobs per well required
2. Producing: 0.2 to 0.4 full-time equivalent jobs required

**Housing demands/Living conditions**
1. Drilling: hotels, temporary residential facilities ("man camps"), campgrounds, and existing rental housing stock
2. Producing: permanent housing

Wealth and Shale Energy Development

- Payments come in two parts
- Payments to individual landowners can be significant
- Income flows often short-term
Research Questions

Has the influx of workers and wealth associated with shale oil and gas development changed retail food options available to original residents?

Sample

Number of Retail Food Establishments

1. NAICS=445110  Supermarkets and Other Grocery Stores
2. NAICS=447110  Convenience Stores attached to Gas Stations
3. NAICS=452910  Warehouse Stores and Supercenters
4. NAICS=722513  Limited-Service Restaurants
Explanatory Variables

Key Explanatory Variable
1. Number of Oil and Gas workers NAICS=2111 (EMSI)

Control Variables
1. Log population density (BEA and USGS land area)
2. Log per capita income (BEA)
3. Poverty rate (SAIPE)
4. Industry mix (EMSI)

Method: Triple Differences

\[ \text{# Stores}_{3D} = \] 
\[ (# \text{Stores}_{2012} - # \text{Stores}_{2007}) - (# \text{Stores}_{2007} - # \text{Stores}_{2002}) \]

First difference: The difference between the boom and preboom periods
Second difference: The change between the beginning and end points of each period
Third difference: The difference between shale and non-shale

Findings: Fast Food Establishments

• Widespread growth over past decade
• Typically in places with lower incomes
• Conflicting evidence on connection with obesity
• Positive statistical relationship with O&G employment
• Shale workers have higher incomes, but higher value of convenience
Findings: Grocery Stores
• Proximity to grocery stores associated with BMI
• Longer-term trend of grocery consolidation
• Location usually associated with incomes and minorities
• No statistically significant relationship to O&G employment
• May be countervailing forces of income and minorities

Findings: Supercenters
• Supercenters have steadily increased their grocery offerings
• Some evidence connecting supercenters and BMI
• Inverse relationship with O&G employment
• Only counties with large booms experience small declines
• Could be from local labor costs

Findings: Convenience Stores
• Usually limited food offerings, though recently increased
• Often less healthy and more expensive
• No relationship with O&G employment
Local Policy Interventions
Focused on food environment
- Retail
  - Existing retail
  - New retail (encouraging healthy and discouraging unhealthy)
  - Mobile retail
- Transportation
  - Policy types (zoning, grants, public programs/projects, plans)
Focused on the community

Conclusions
Shale oil and gas activity is changing food environments in local communities
In particular, activity is increasing fast food options but has little effect on grocery stores
Local officials should consider policy options

What are the implications for communities?
ENTER YOUR RESPONSE IN THE CHAT BOX.
## Oil and Gas Employment’s Impact on Retail Food Establishments

<table>
<thead>
<tr>
<th></th>
<th>Fast Food</th>
<th>Grocery Stores</th>
<th>Supercenters</th>
<th>Convenience Stores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differenced oil and gas employment</td>
<td>-0.053**</td>
<td>0.0043*</td>
<td>-0.0029*</td>
<td>-0.0040 (2.60)</td>
</tr>
<tr>
<td>Differenced logged population density</td>
<td>1.64</td>
<td>10.31</td>
<td>2.42</td>
<td>11.83 (2.15)</td>
</tr>
<tr>
<td>Differenced logged per capita income</td>
<td>0.66</td>
<td>3.49</td>
<td>0.07</td>
<td>0.24 (0.34)</td>
</tr>
<tr>
<td>Differenced poverty rate</td>
<td>0.15</td>
<td>0.28</td>
<td>-0.02***</td>
<td>0.13 (0.27)</td>
</tr>
<tr>
<td>Differenced industry mix growth</td>
<td>0.21</td>
<td>0.63</td>
<td>-0.05</td>
<td>0.12 (0.62)</td>
</tr>
<tr>
<td>2002 log of population density</td>
<td>0.38</td>
<td>8.91*</td>
<td>0.09</td>
<td>2.74*** (0.84)</td>
</tr>
<tr>
<td>2002 log of per capita income</td>
<td>0.78</td>
<td>2.13</td>
<td>0.36</td>
<td>8.78 (0.18)</td>
</tr>
<tr>
<td>2002 poverty rate</td>
<td>0.43</td>
<td>1.65*</td>
<td>0.05</td>
<td>0.44 (0.36)</td>
</tr>
</tbody>
</table>

| N        | 178      | 178      | 178      | 178                  |
| J-squared | 0.298    | 0.613    | 0.132    | 0.246                |