



FEDERAL RESERVE BANK *of* KANSAS CITY

# Rural Wealth Creation and Emerging Energy Industries

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*The views expressed are those of the presenter and do not reflect  
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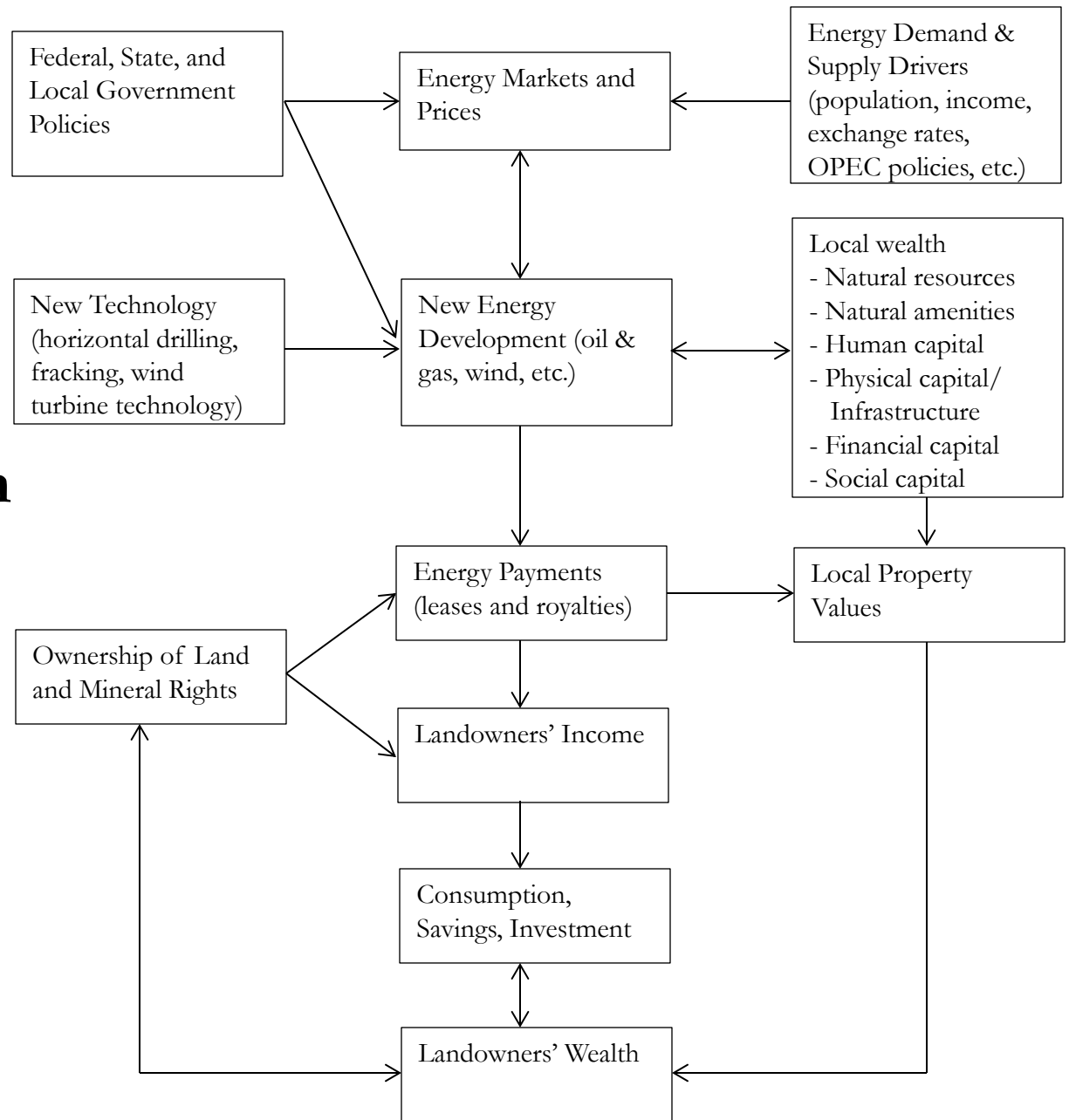
# Background

- 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

- “Sustainable Rural Development and Wealth Creation: Five Observations Based on Emerging Energy Opportunities.” with John Pender and Jeremy Weber. *Economic Development Quarterly* 2014 Vol. 28(1): 73-86.
- “Rural wealth creation and emerging energy industries.” with John Pender and Jeremy Weber. In *Rural Wealth Creation* (eds). J. Pender, B. Weber, T. Johnson, M. Fannin. Routledge. 2014.
- “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



# 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 effects 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 (Kargbo 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



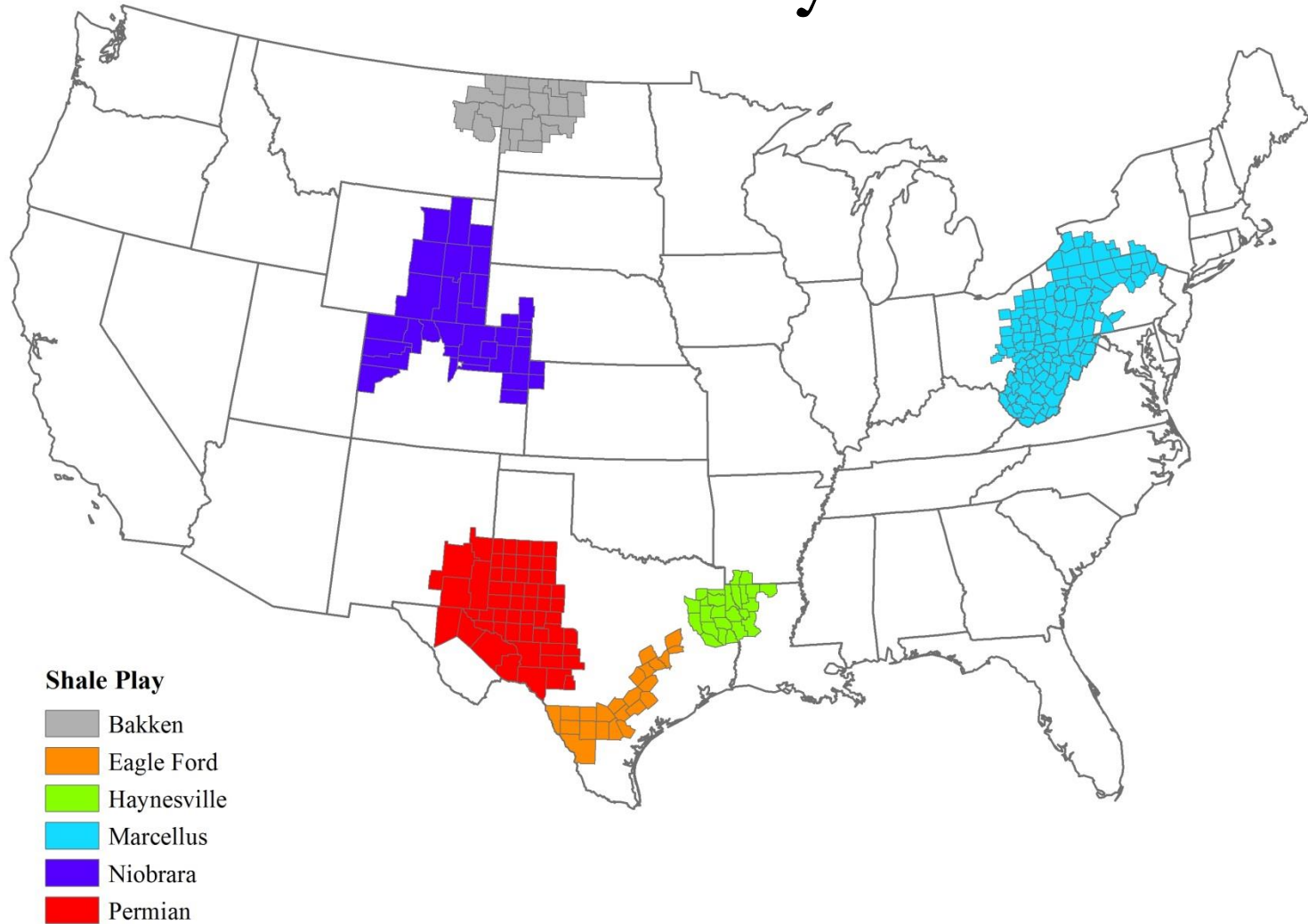
# Feedback effects on different types of wealth

- 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

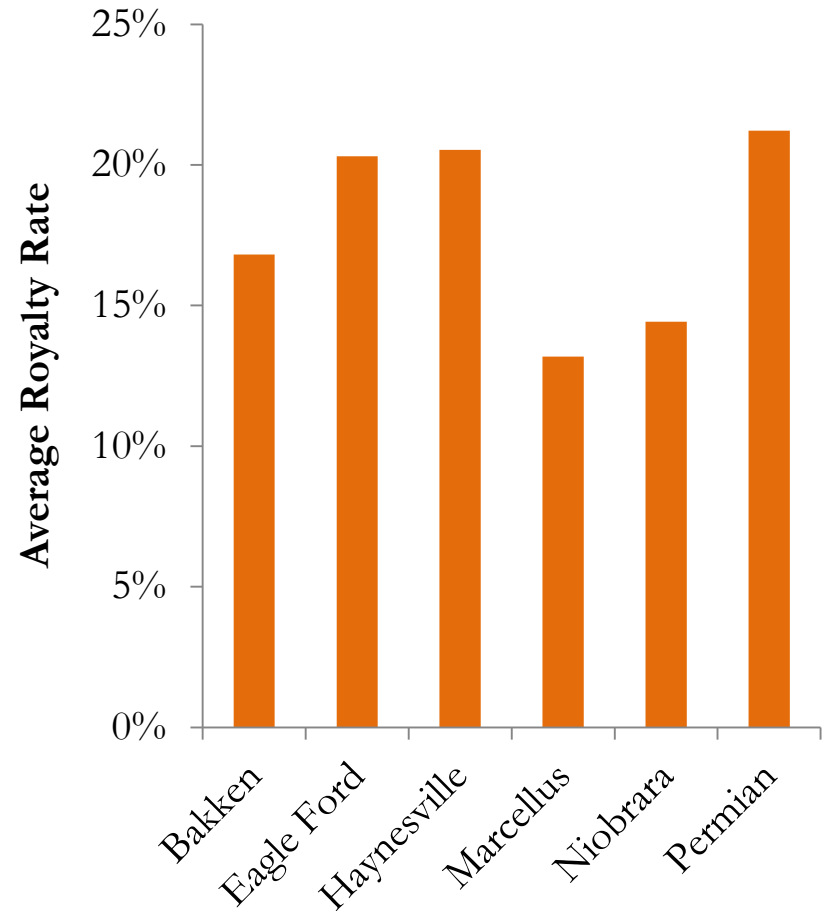
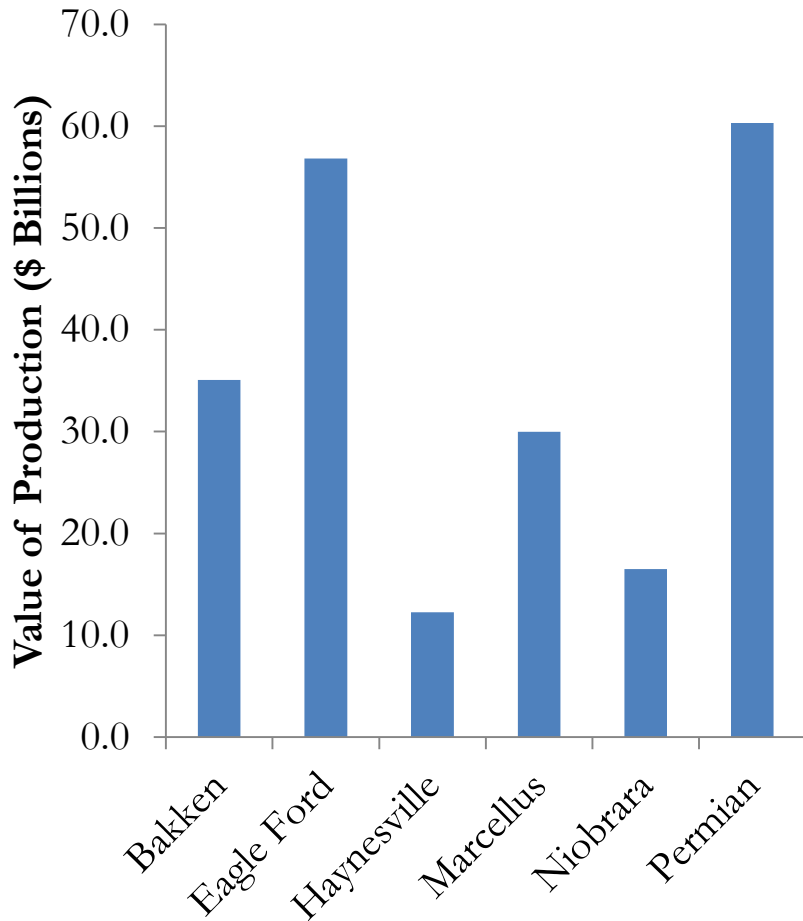
- Leasing data are from DrillingInfo
  - nearly 160k private leases from around the country
- Estimate that six major plays generated \$39 billion in royalties in 2014
- In more rural areas, royalties rival
  - Government transfer payments
  - Federal farm commodity programs
- Percentage of mineral rights held by county residences varies substantially across shale plays, 12 to 55 percent

# Shale Plays



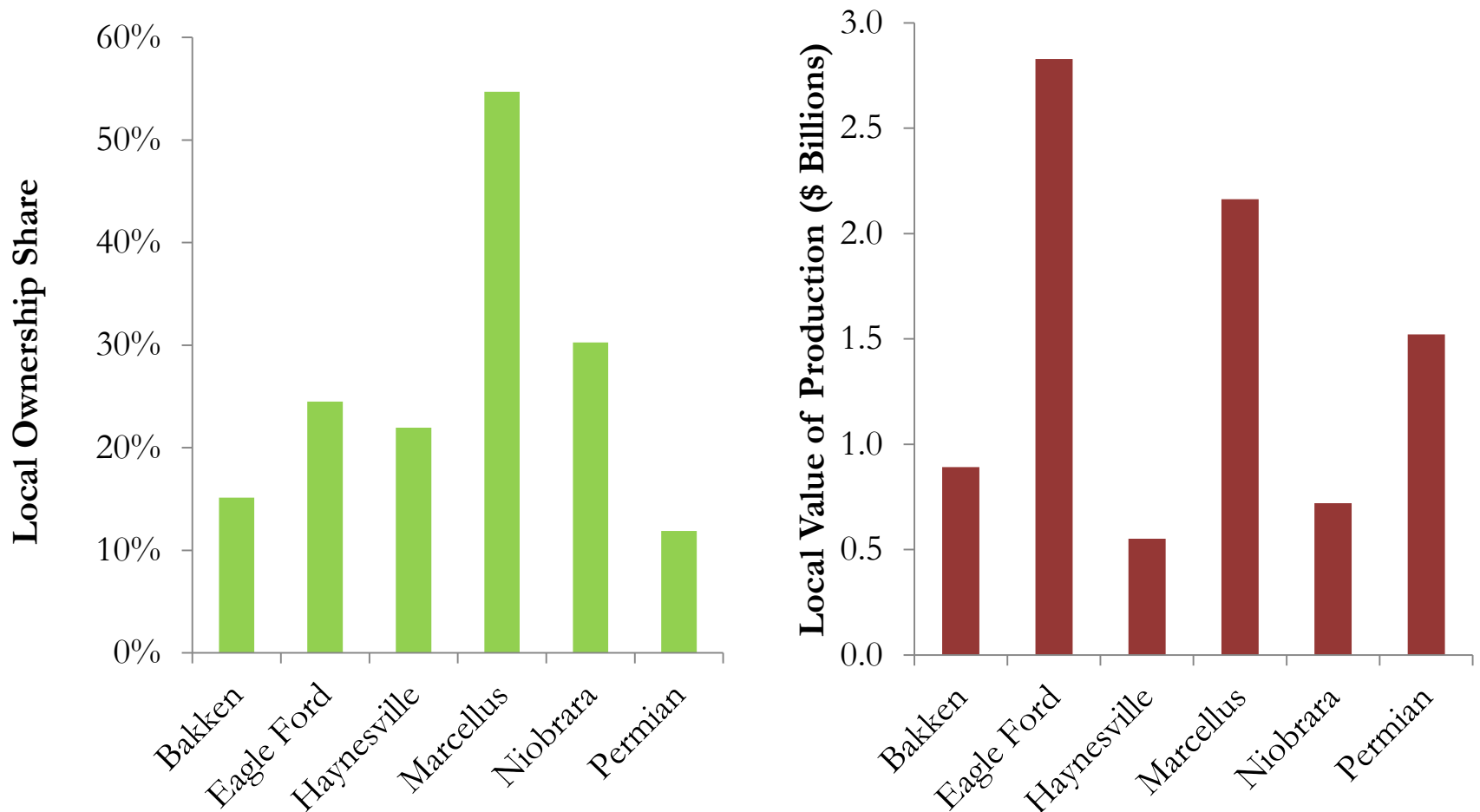
Source: Energy Information Agency

# Value of Production & Royalty Rates by Play



Source: Authors' calculations

# Local Ownership & Local Value of Production



Source: Authors' calculations

# Royalty Income Estimates, 2014

	Shale Play					
	<u>Bakken</u>	<u>Eagle Ford</u>	<u>Haynesville</u>	<u>Marcellus</u>	<u>Niobrara</u>	<u>Permian</u>
Royalty income ( \$ per capita)	27,414	12,007	1,811	431	739	9,768
Local royalty income (\$ per capita)	4,148	2,942	398	236	224	1,161
Govt. transfers (\$ per capita) <sup>1</sup>	6,455	6,712	8,345	9,146	5,652	6,997
Federal farm payments (\$ per capita) <sup>2</sup>	587	33	10	9	44	186

<sup>1</sup> BEA REIS; <sup>2</sup> 2012 Census of Agriculture

# 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