



THE OHIO STATE UNIVERSITY

Making Shale Development Work in the Long Run

Federal Reserve Bank of Cleveland

Multistate Shale Research Collaborative

SHALE SYMPOSIUM: WHAT COMMUNITIES NEED TO KNOW

Wheeling, WV,

March 19, 2015

Presented by: Mark Partridge

Partridge.27@osu.edu

Introduction

- **Goal: 1) Explain the economic research on the impacts of energy and new shale development.**
- **2) Most important, discuss how to make shale development work in the long run.**
- **I won't discuss environmental issues regarding shale development.**
- **I also won't discuss whether shale development is a net positive for the country except to note that it produces less expensive energy with what appears to be fewer environmental consequences than the next likely alternative.**

Introduction

- This presentation is based on the following works:
 - **Kelsey, Tim, Mark D. Partridge, and Nancy White. “Unconventional Gas and Oil Development in the United States: Economic Experience and Policy Issues.”**
 - Betz, Michael, Michael Farren, Linda Lobao, and Mark D. Partridge. “Coal Mining, Economic Development, and the Natural Resources Curse.”
 - Farren, Michael, Amanda Weinstein, Mark D. Partridge, Mike Betz. “Too Many Heads and Not Enough Beds: Will Shale Development Cause a Housing Shortage?” Swank Program in Rural-Urban Policy Summary Report, June 2013. Available at: www.aede.osu.edu/programs/Swank.
 - Farren, Michael, Amanda Weinstein, and Mark D. Partridge. “Making Shale Development Work for Ohio.” Swank Program in Rural-Urban Policy Summary Report, May 2012. Available at: www.aede.osu.edu/programs/Swank.
 - Weinstein, Amanda and Mark D. Partridge. *The Economic Value of Shale Natural Gas in Ohio*. Swank Program in Rural-Urban Policy Summary Report, December 2011. Available at: www.aede.osu.edu/programs/Swank.
 - Weinstein, Amanda and Mark D. Partridge. “The Economic Impact of Shale.” Presented by Amanda Weinstein at the North American Regional Science Association Conference, Bethesda, MD, November 14, 2014.

Introduction

- America has undergone what has been called a shale revolution that at the turn of this century would have seem improbable.
 - Reports that America is the #1 gas producer in the world and perhaps will be the #1 oil producer.
 - Implications for energy independence, though oil prices are determined on global markets.
 - The industry and their supporters refer to “millions” of jobs being created. They definitely create local demand for certain local services and they may enhance “agglomeration economies.”
 - Struggling communities gain a badly needed economic boost.



AMERICA'S ENERGY ECONOMY

"Cheap energy—the revolution that's going on in America's heartland on energy—is making sure that America now has a manufacturing renaissance." Rahm Emanuel, Chicago Mayor and former Obama White House Chief of Staff

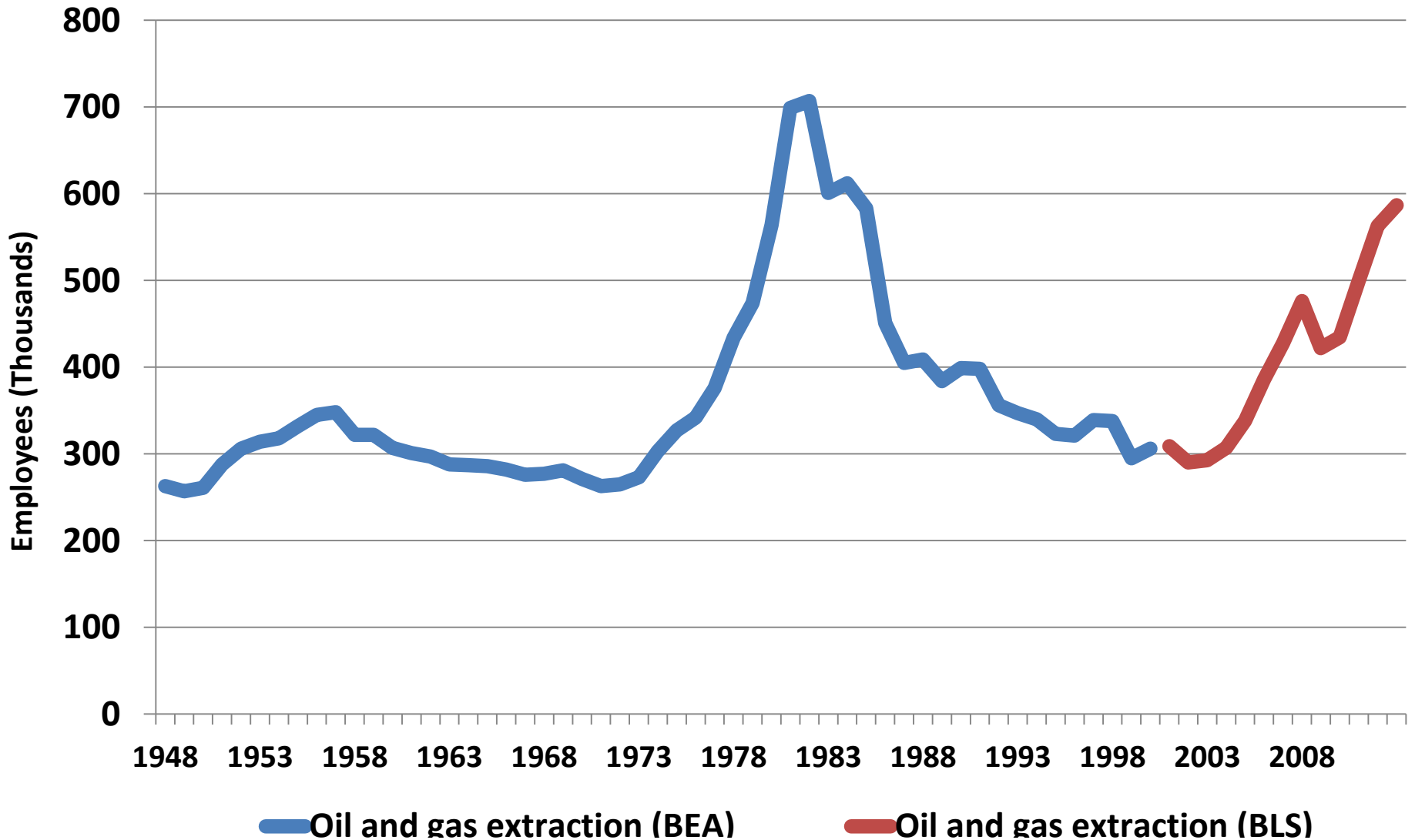
Fracking brings good jobs and prosperity to towns across America. The industry supported 2.1 million jobs in 2012, across all 50 states (<http://www.api.org/policy-and-issues/policy-items/jobs/oil-and-natural-gas-stimulate-american-economic-and-job-growth>), and could support 3.9 million by 2025. But the job numbers provide just a glimpse into the benefits energy safely and responsibly (</americas-energy/environment>) developed with hydraulic fracturing (</americas-energy/experience>) is having and will have on the lives of individual Americans and our broader economy. In 2012, energy from fracking (</americas-energy/energy>) and related chemical activity contributed almost \$284 billion to GDP while abundant, affordable energy from shale has helped fuel a U.S. manufacturing resurgence. For U.S. households, the energy surge made possible by fracking has produced household savings through lower natural gas prices estimated at \$1,200 per household (http://www.api.org/~media/Files/Policy/Hydraulic_Fracturing/Oil-Gas-Generates-Big-Savings-For-Schools-States.pdf) in 2012.

Introduction

- Many claim that the revolution has brought many costs and unintended consequences.
 - Natural resource curse is the long-run observation that natural resource dependent economies lag otherwise equal economies.
 - These all relate to the natural resources curse but I won't stress in my discussion:
 - Environmental costs such as dust, unsightly eyesores, small earthquakes, water issues, etc.—not my topic though you have likely heard many claims and counterclaims.
 - Corruption, weak governance, and crime
 - Less incentive for educational attainment

First some background on the energy industry.

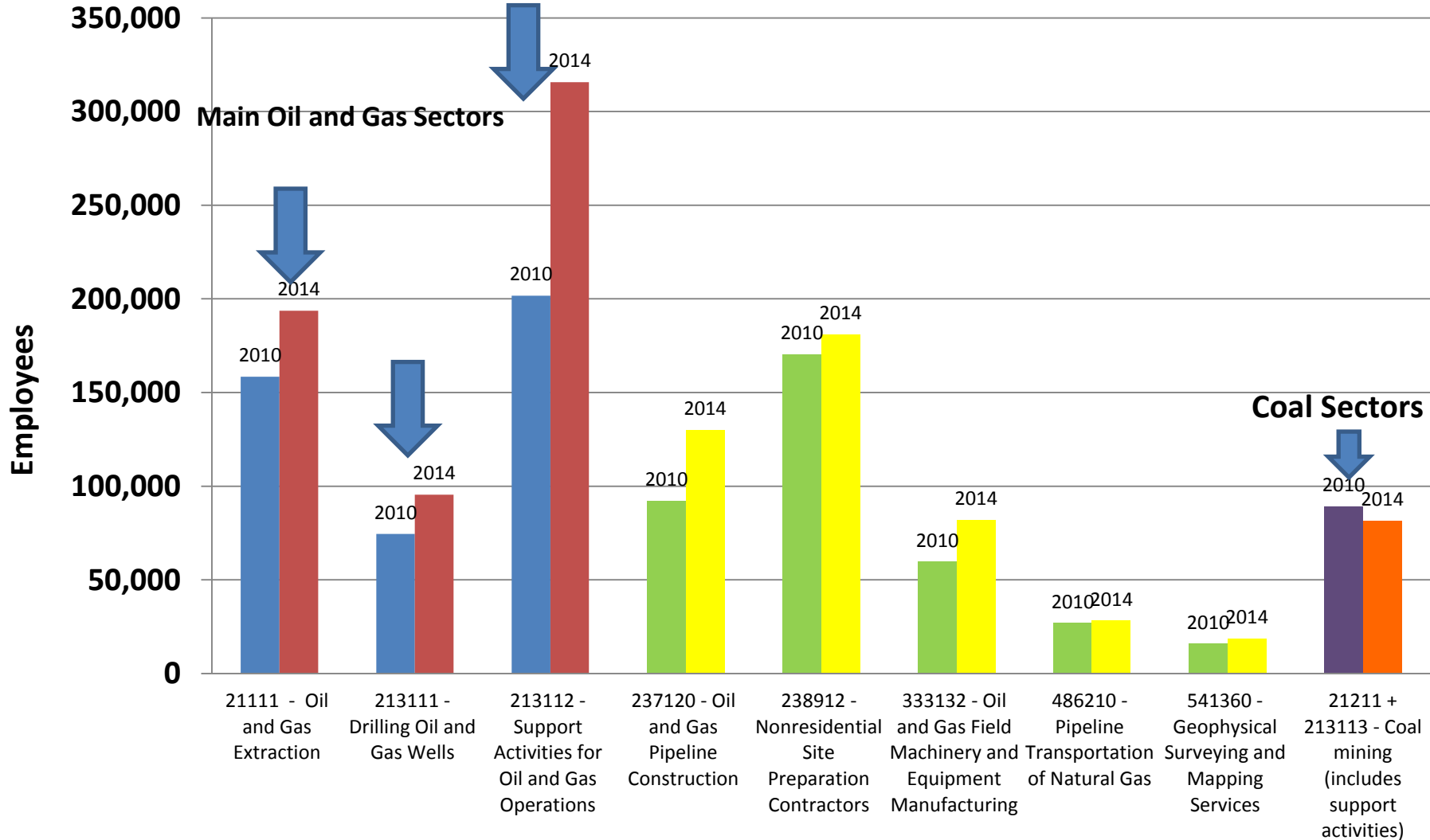
Direct U.S. Oil & Gas Employment: 1948-2013



Sources: 1. Bureau of Economic Analysis - National Income and Product Accounts Tables 6.4A-D

2. Bureau of Labor Statistics Quarterly Census of Employment and Wages: for oil and gas, we use NAICS 211, 213111 and 213112.

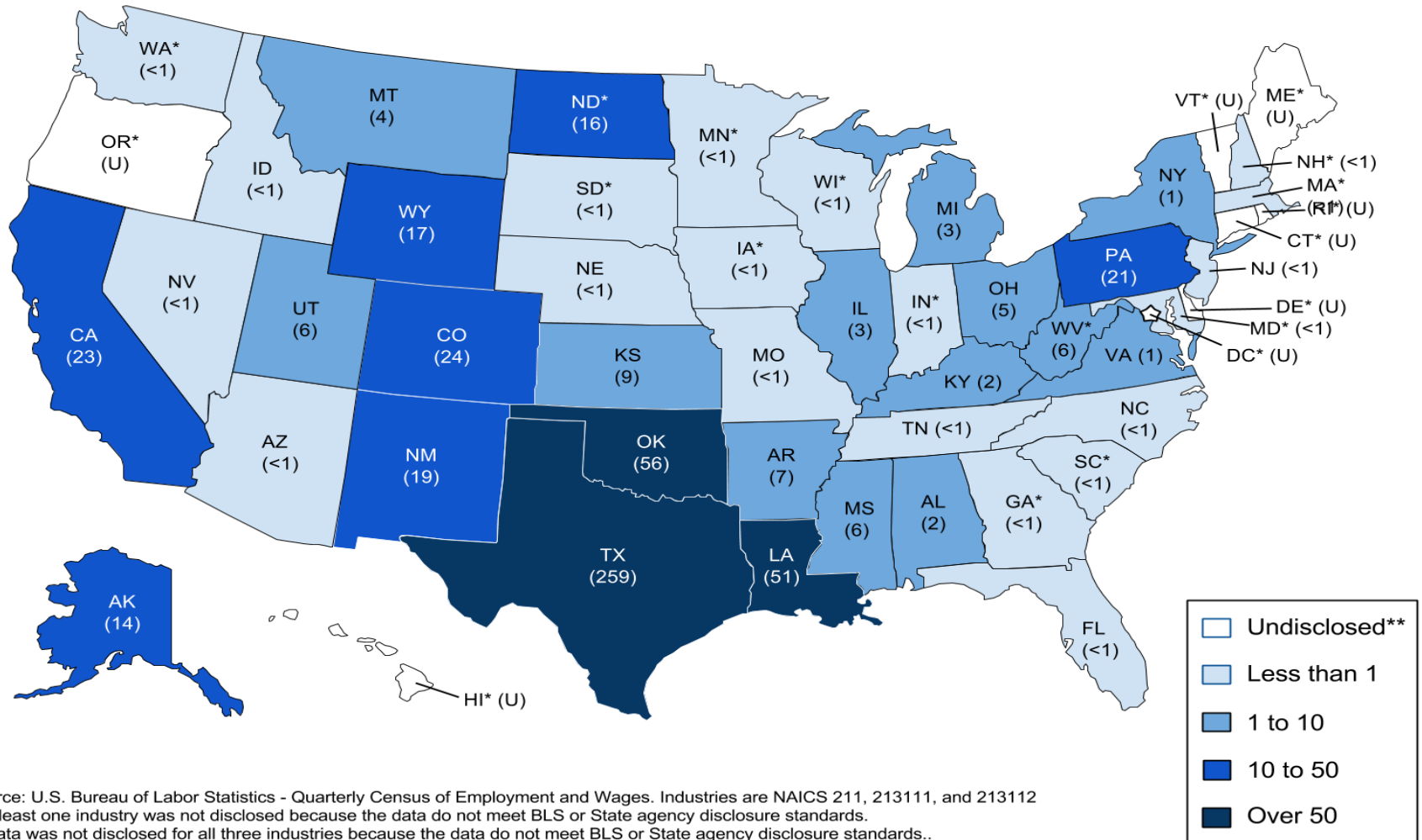
Employment in Direct and Key Indirect Oil, Gas Sectors, and Coal Mining: 2010 and 2014



Source: Bureau of Labor Statistics Quarterly Census of Employment and Wages (<http://www.bls.gov/data/>), NAICS codes listed for each sector. For 2014, we averaged the first six months together to produce an annual average.

Oil and Gas Industry Employment by State in 2012

(in thousands)



Source: U.S. Bureau of Labor Statistics - Quarterly Census of Employment and Wages. Industries are NAICS 211, 213111, and 213112

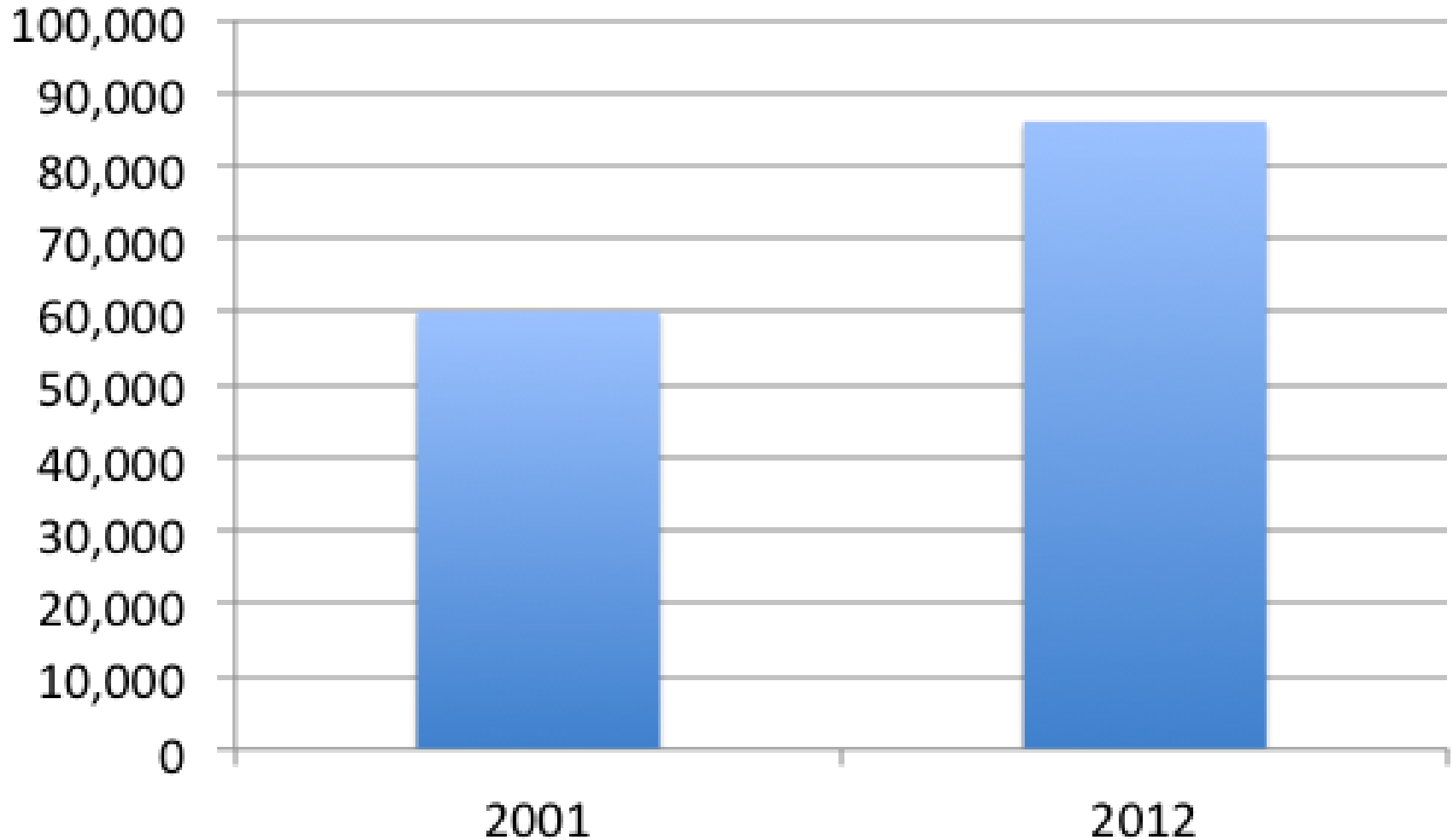
* At least one industry was not disclosed because the data do not meet BLS or State agency disclosure standards.

** Data was not disclosed for all three industries because the data do not meet BLS or State agency disclosure standards..

Adapted from: Kelsey et al. 2015

Oil and Gas Sector Employees in Harris County, TX

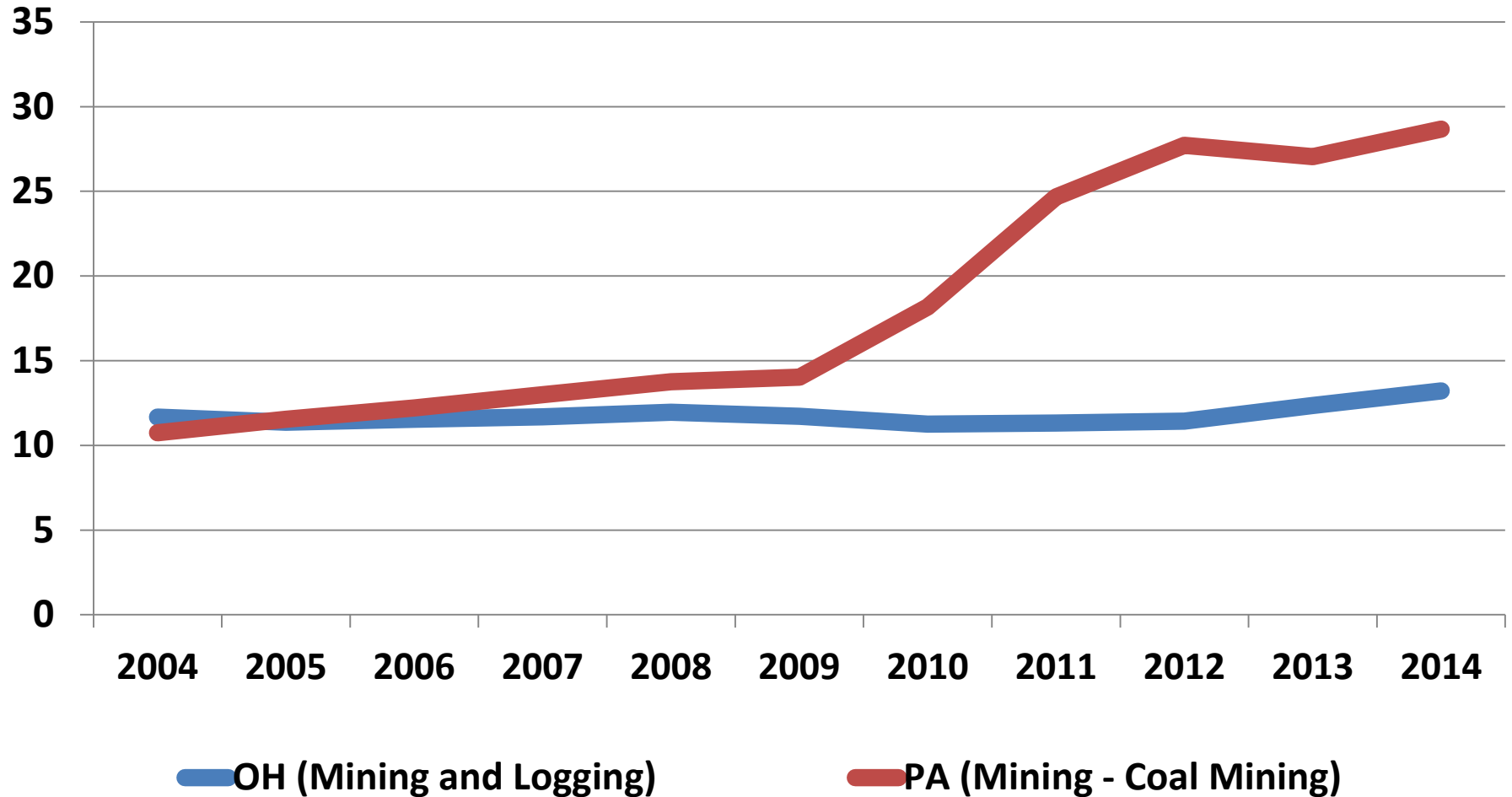
2001 and 2012



Source: U.S. Bureau of Labor Statistics - Quarterly Census of Employment and Wages (<http://www.bls.gov/cew/>)
Energy sectors include NAICS 211, 213111, and 213112

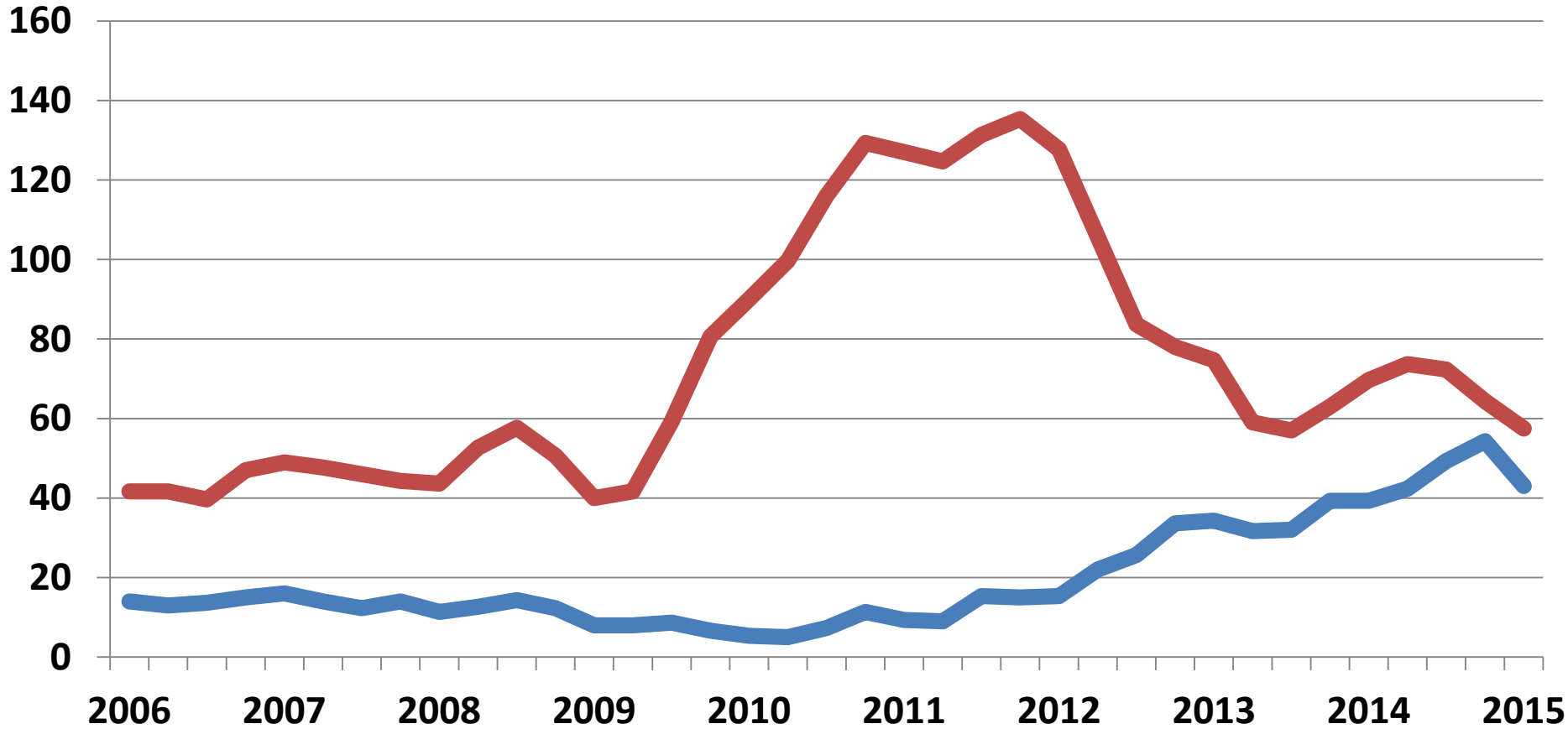
Adapted from: Kelsey et al. 2015

Ohio and Pennsylvania Employment in Mining in Thousands (2004 - 2014)



Source: U.S. BLS Current Employment Statistics. PA is net of coal mining for a more

Number of Rigs Pennsylvania and Ohio: Quarterly Average: 2006I-2015I



Source: RigData (<http://rigdata.com/index.aspx>) **OH**

PA

We take the average weekly count for the quarter. It averages the

Natural Resources Curse

- The old Texas barroom joke: “*Dear God, give me one more oil boom. This time I promise not to piss it away.*” (Kelsey et al., 2015).
- What are the “economic” causes of a possible Natural Resources Curse keeping in mind that the other causes could matter.
- 1. Boom/bust economies are not conducive to most business investment—most businesses prefer stability. Today’s roller coaster of energy prices is a great example.

From CNN in January 22, 2015

Oil boomtown: 'We could see 20,000 layoffs by June'

“Oil prices have been sinking for months. And while that's good news for most Americans, what happens to towns like Williston, N.D., that have built an entire economy around the oil industry?”

Source: <http://money.cnn.com/2015/01/22/news/economy/oil-boomtown-layoffs/index.html?sr=fbmoney012215boomtown1100story>. Downloaded Feb 9, 2015.

Natural Resources Curse

- 2. Closely related, diverse economies tend to out perform economies concentrated in one sector. They have wider job opportunities and broader services for businesses.
 - So, if an economy is too natural resource dependent, then that can be problematic.
- 3. Large scale mining and manufacturing operations have not been conducive to entrepreneurship and small business development.
- 4. Mining booms can be associated with crowding out or “Dutch Disease.”
 - In a local context, if a mining boom bids up wages, firms in other industries may not be able to hire workers and it could put the tradeable sector at particular risk due to higher costs.

Brief Review of the Evidence

- *“We’ve been so poor for so long, then all of a sudden, we won the goddamn lottery. You know what happens to lottery winners ... you read about them three years later. They’re in court, or they’re in bankruptcy, or they’re divorced ... that’s the way we are.”*
 - Jim Fuglie, a former North Dakota state tourism director in Center for Public Integrity (2014) (Kelsey et al. 2015)
- Assessing natural resources curse for **recent** boom is not possible because the curse is long run. We need to see the boom and the bust in the **longer run** to fully assess.
 - We really only have good recent data for the boom phase.
 - So we mainly have to look at old oil booms.

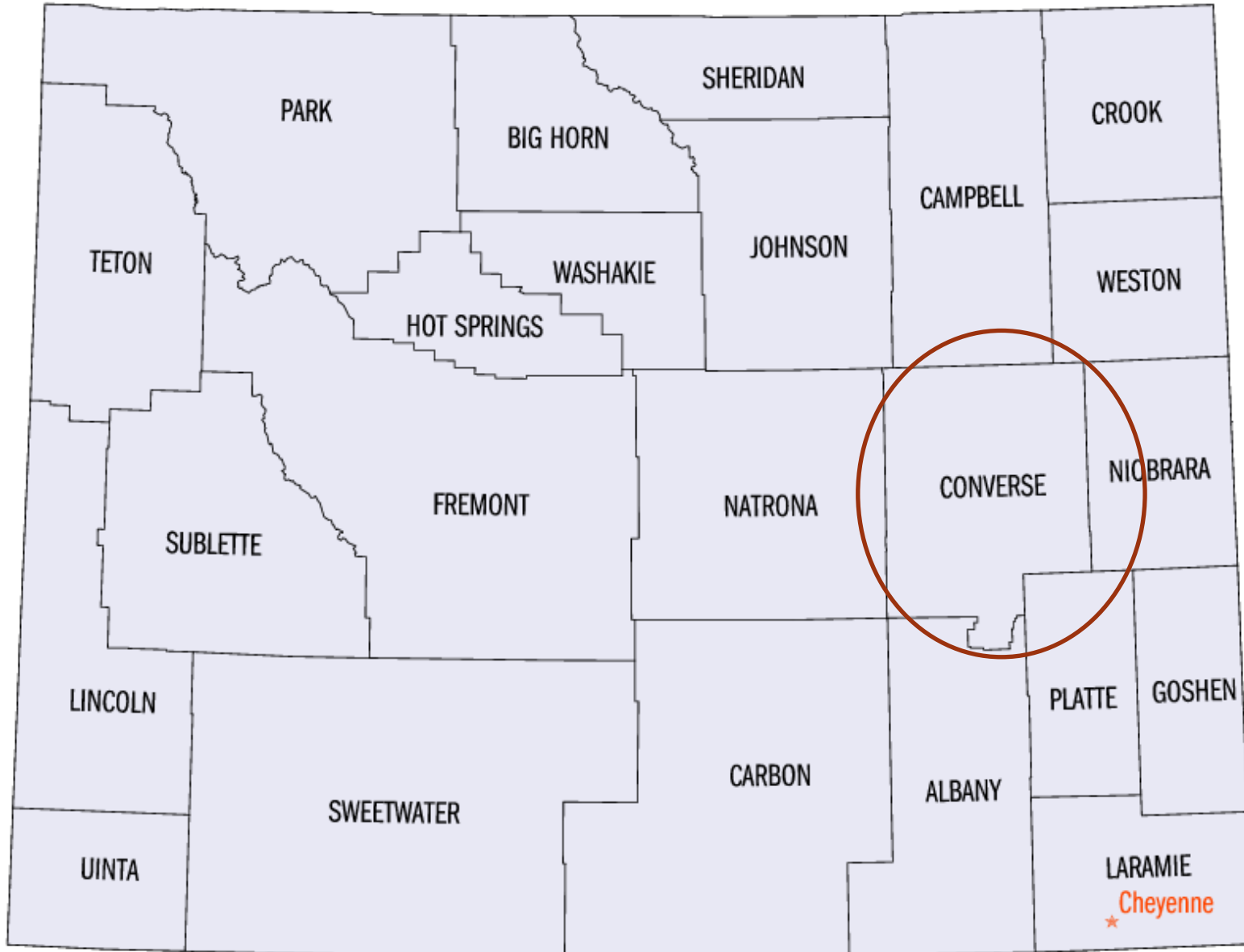
Brief Review of the Evidence

- Michaels (2010) finds that in the Southwest, locations near large oil deposits fared better than otherwise equal locations, but this advantage weakened after about 1960. He attributed this to agglomeration economies.
- Haggerty et al (2014) (*J. of Energy Econ.*) find that communities most tied to the energy boom of the 1970s/early 1980s did not fare as well as otherwise equal communities. Similarly, Jacobsen and Parker (2014) also find that resource booms are not linked to faster long-run growth.
- Our work at OSU....
- A general conclusion is better institutions at least mitigate if not entirely eliminate a natural resources curse: e.g., Norway, Alberta....

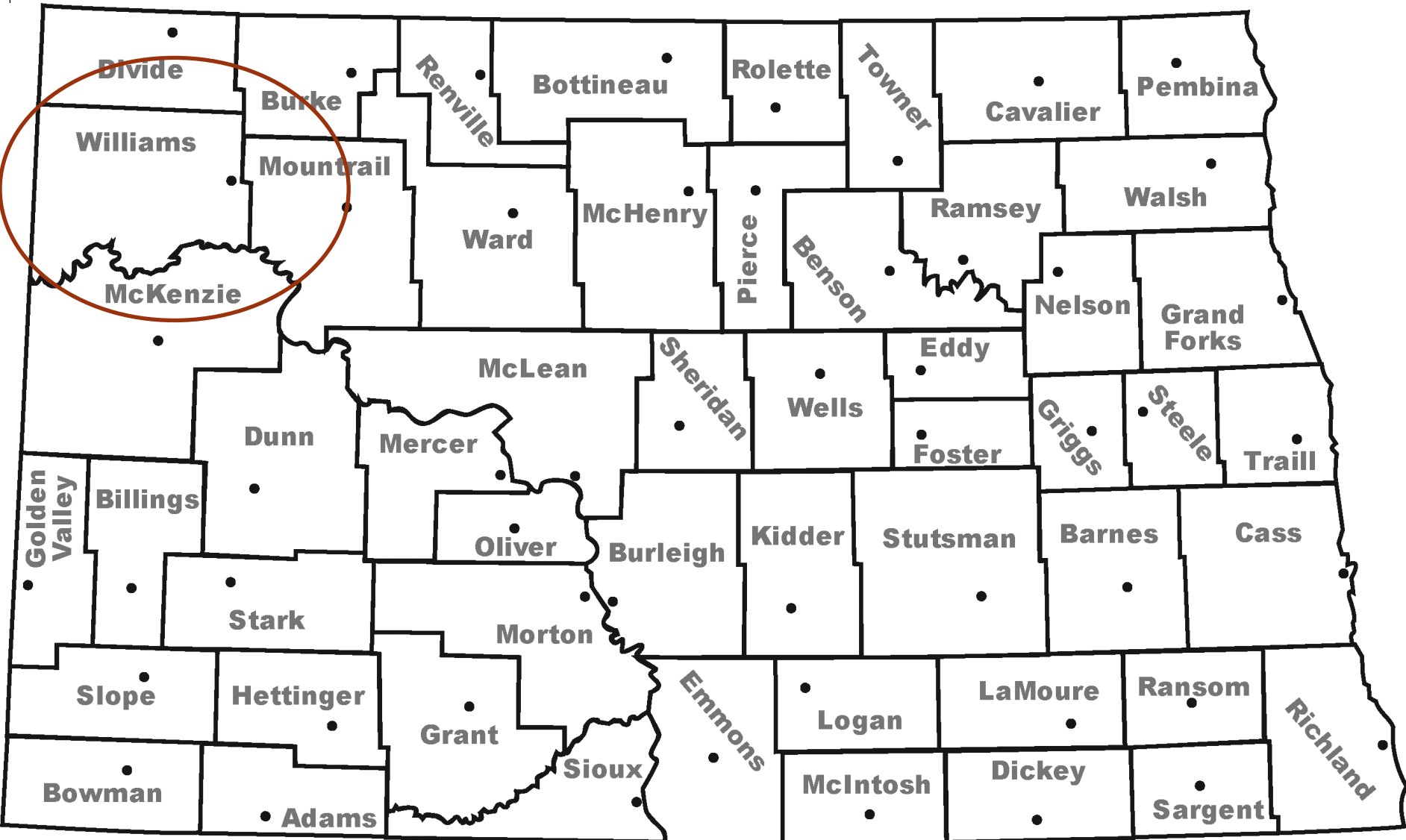
Brief Review of the Evidence

- In the short-term, the local employment effects are typically more modest during the boom: Brown (2014), Weber (2012), Weinstein (2014), Weinstein and Partridge (2011), Paredes et al. (forthcoming)—though we can find major exceptions such as the Bakken or parts of Texas.
- Though not unanimous, there appears to be positive income effects.
- A Pennsylvania study found that the initial pre-drilling phase accounts for 18% of the employment associated with unconventional gas development (Brundage, et al. 2011).
- The drilling and infrastructure development phases account for 80% of such employment.
- **Once wells are drilled, production, compression, and processing generate only 2% of total employment.**

Case Study 1: Converse County Wyoming

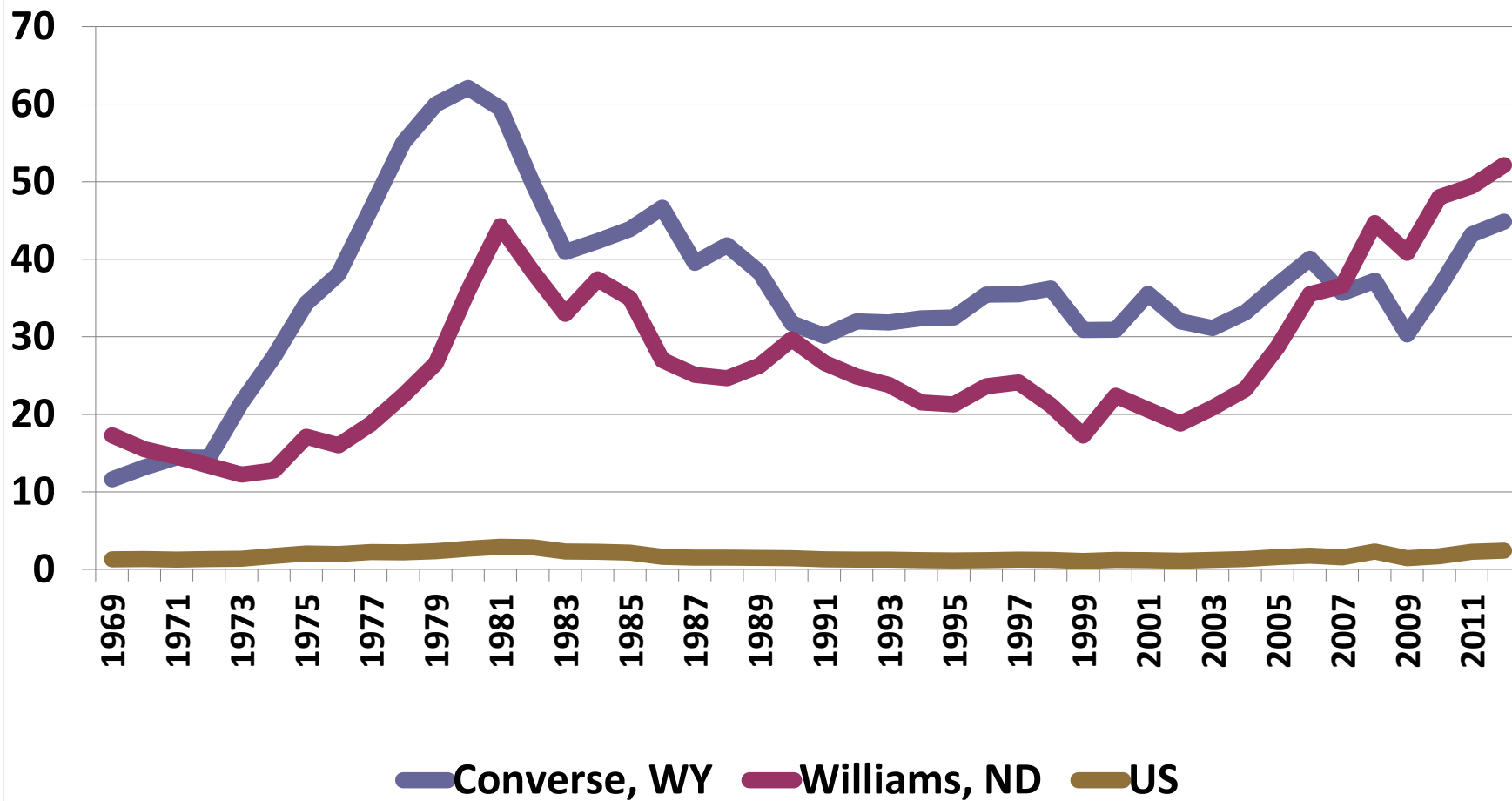


Case Study 2: Williams County North Dakota



Share of Wages and Salary in Mining (1969-2012)

Very Energy Dependent and Very Volatile

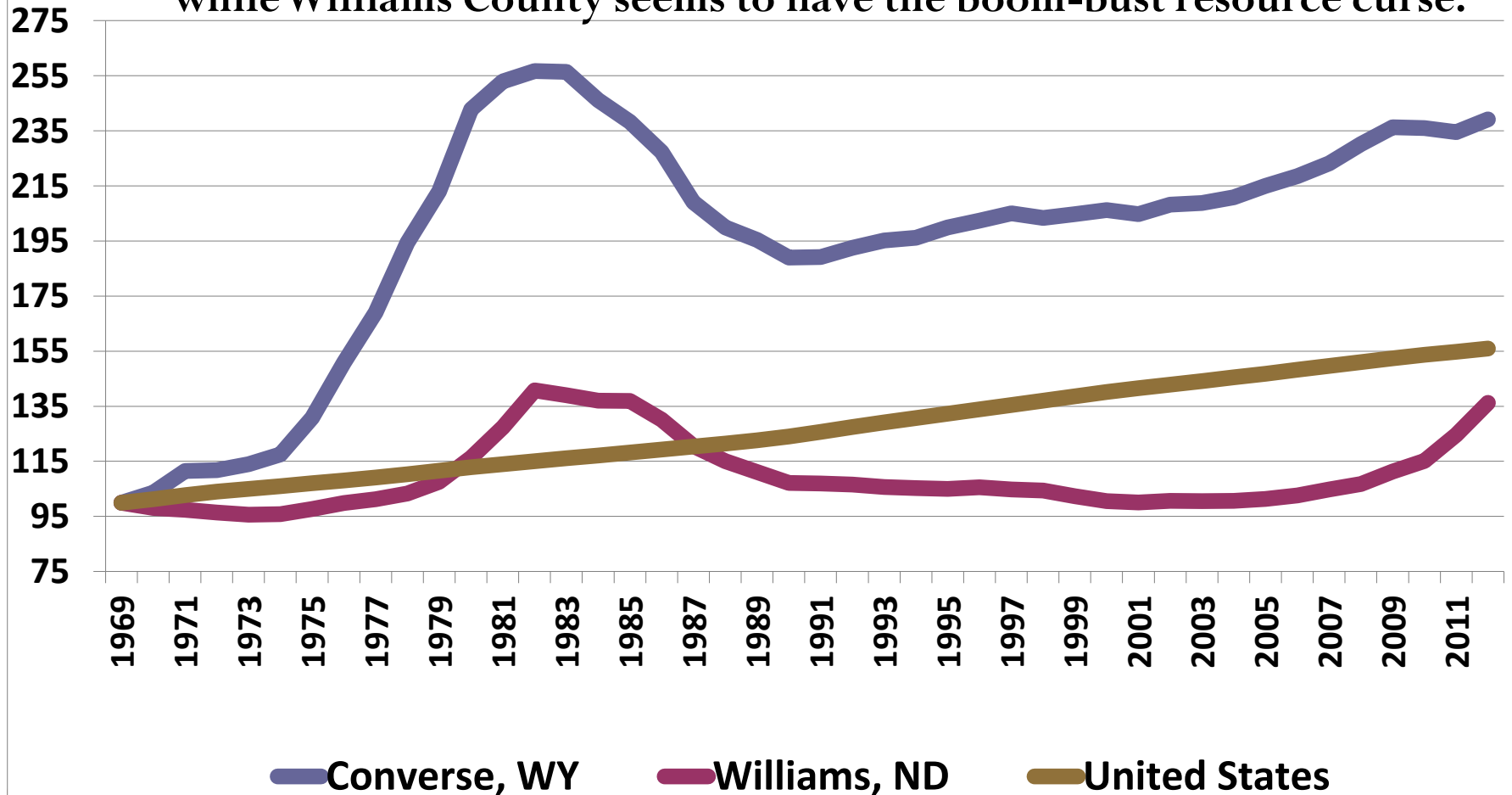


Source: Kelsey et al., 2015

Population (1969-2012)

Benchmarked at 1969 = 100

Converse County appears to benefit from agglomeration economies while Williams County seems to have the boom-bust resource curse.



Source: Kelsey et al.,

How can the natural resources curse be avoided?

- Following Kelsey et al., Farren et al. (2012), and Headwaters (2012)
- 1) Do No Harm—this is not a cliché in local economic development. Regardless of the industry or situation, states and local gov'ts have a long history of headline-grabbing events that don't pay off versus true and steady “build from within.”
 - i. Use lease/royalty payments, impact fees, and tax receipts, etc. to fund long run investments that strengthen the community so it can better adapt after the drilling (e.g. not just use the monies to pay for tax cuts or expenditures which will need to be reversed after the boom).
 - ii. Do not make long-run financial commitments (particularly for infrastructure) that may burden the community long term (a ‘pay as you go’ is better).
 - iii. Strive to build a diversified economy (rather than allowing the gas development to crowd out other economic activity).
 - iv. Protect important environmental and community assets and amenities so they are not harmed during the boom. These assets typically are important for local quality-of-life and help provide the foundation for the local economy.

How can the natural resources curse be avoided?

- **2) Ensure that the hidden costs of resource extraction are adequately compensated**
 - The industry (any industry) should pay the full costs of negative externalities such as pollution and congestion through setting taxes, fees, and regulations such that marginal costs equal marginal benefits.
 - Allowing an industry to avoid paying for its full costs is not pro-business, but instead shifts those costs onto other sectors of the local economy and local residents (reducing the region's quality of life), which diminishes both the short- and long-term competitiveness of the region.
 - A good positive example are the Road Use Agreements in Pennsylvania, between natural gas companies and municipal governments, in which the companies agree to pay the full costs of road repairs and upgrades due to the road damage they cause.

How can the natural resources curse be avoided?

- **3) Leverage the additional wealth and economic activity into permanent advantages .**
 - Think about diversification now and use the wealth to support local entrepreneurial activities.
 - During the boom, communities are bigger and have more ability to grow.
 - Waiting to the bust is typically too late.
- **4) Levy severance taxes that capture resource rents.**
 - Use the proceeds to fund public infrastructure, human capital development, and environmental enhancements to ensure long-term growth after the resource is depleted.
 - The severance tax should fund permanent trust funds that can be used well after the energy resource is extracted. Think Norway, Alberta, Alaska.
 - The funds could be used to assist local governments bearing the costs of boom-bust.

How can the natural resources curse be avoided?

- **5) Invest strategically in workforce development**
 - Heavy reliance on a transitory, non-local workforce means much of the wage income quickly leaves the community.
 - These people are typically the first to leave after the bust.
 - Skilled local workers can help after the bust attract/retain businesses.

How can the natural resources curse be avoided?

- **6) Strengthen the capacity of local gov'ts to understand and manage this activity.**
 - Local gov'ts need expertise and help managing this activity. For example, there is a host of new environmental regulatory needs, policing needs, and planning/zoning needs.
 - Many small local gov'ts have minimal staffing, often just part-time.
 - States, universities, and other organizations can provide training for local gov't training and employ regional planning organizations to assist in this process. (Ohio Farm Bureau, OSU extension).
 - Regional collaboration should be facilitated to increase capacity to manage new growth.
 - Create trained circuit-rider shared positions that work across gov'ts, spending a day or two weekly in their assigned jurisdictions. They could be focused solely on energy activity with most urgent needs.
 - These could be state funded.

How can the natural resources curse be avoided?

- **7) Increase the transparency of local government and governance institutions**
 - Limit rent-seeking behavior of industry(ies), other citizens, special interest, and gov't entities to ensure that citizens are the primary objective.
 - Special treatment for the energy industry—or any industry for that matter—is not pro-business and also places gov't in the position of choosing winners and losers in the marketplace.
 - Gov'ts are poor venture capitalist....

Conclusion

- New energy development creates many opportunities for struggling communities.
- Yet, such development is not typically permanent and communities should begin early to avoid the natural resources curse.
- Strategic communities can leverage the short-term growth to boost long-term prosperity.



Thank You!
Partridge.27@osu.edu