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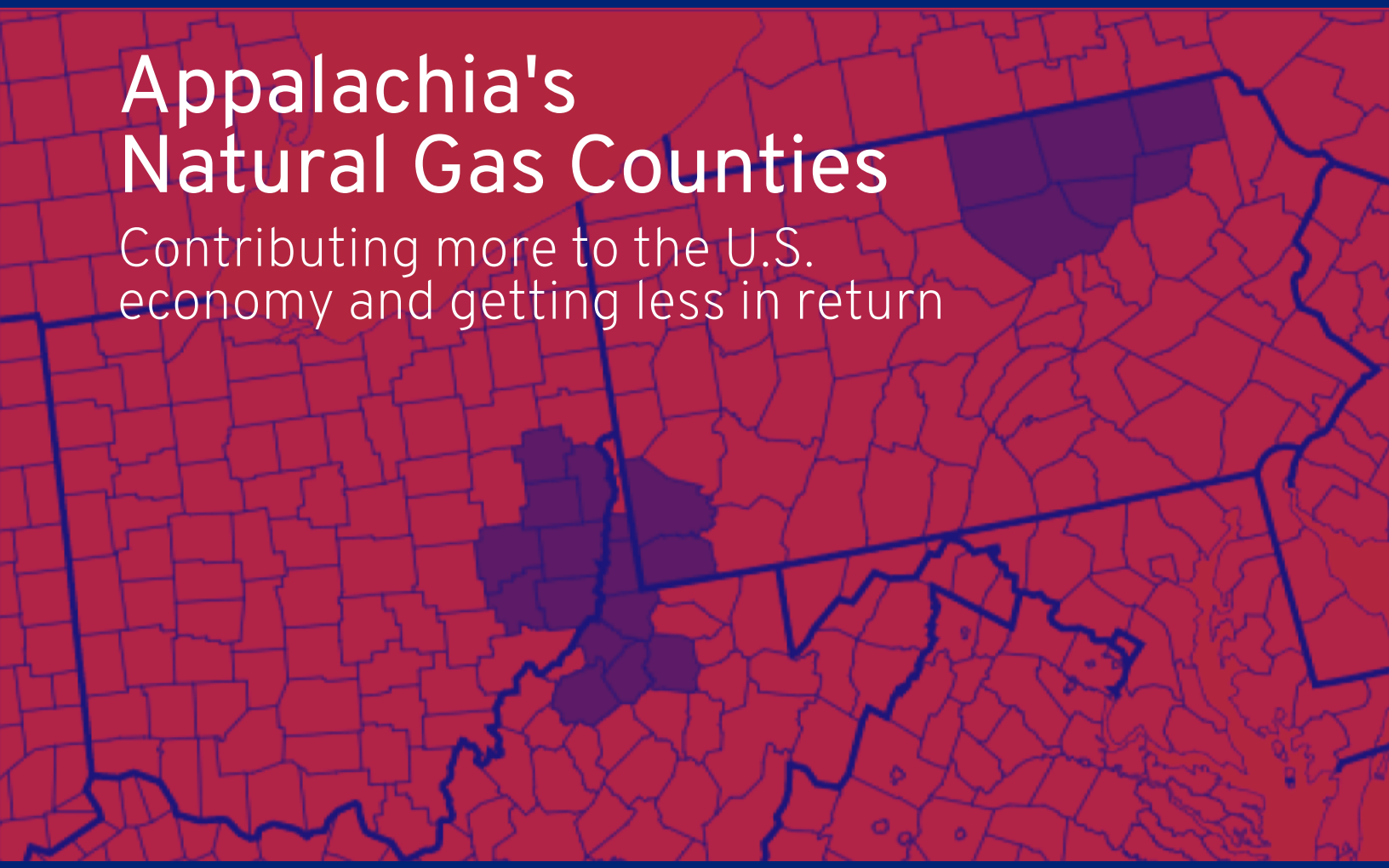
Appalachia's Natural Gas Counties

Contributing more to the U.S. economy and getting less in return



The Natural Gas Fracking Boom and Appalachia's Lost Economic Decade

*(Updated February 12, 2021)**

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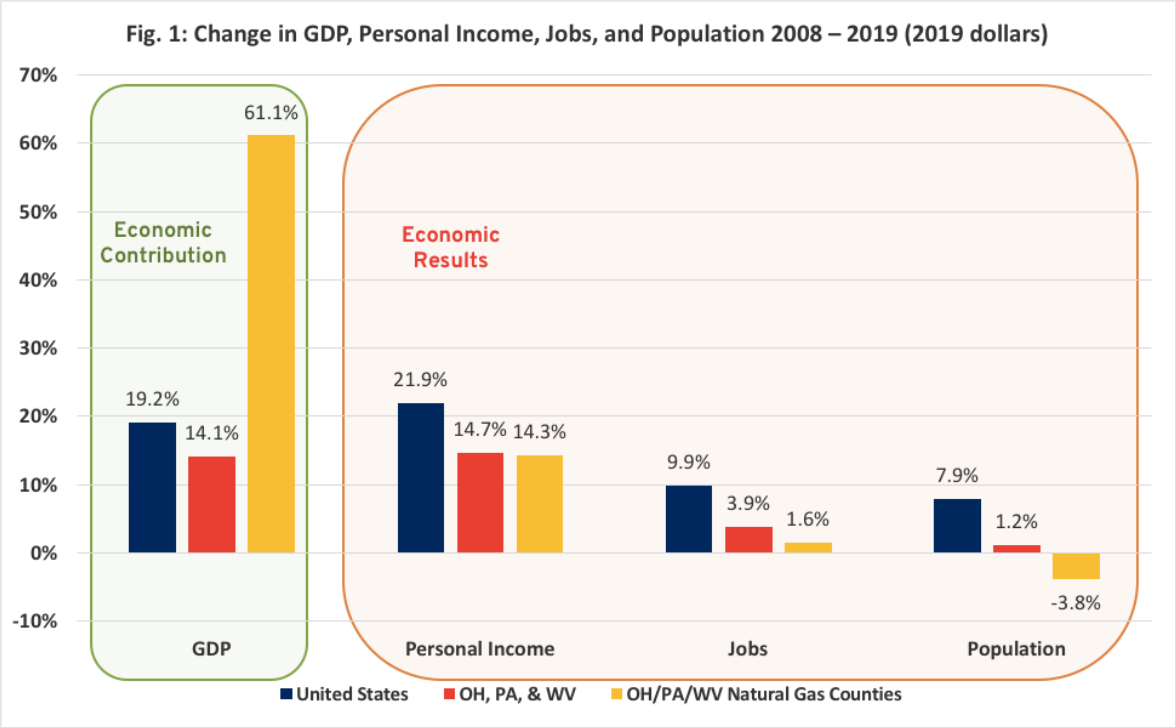
TABLE OF CONTENTS

LIST OF FIGURES

**This report was updated after publication to correct a data transcription error that resulted in minor changes to a few numbers. The update did not significantly affect the report's findings.*

INTRODUCTION: CONTRIBUTING MORE, RECEIVING LESS

Economists debate whether there is such a thing as a "resource curse". But, if one exists, it probably looks something like this:



Sources: U.S. Bureau of Economic Analysis
QCEW Data: U.S. Bureau of Labor Statistics

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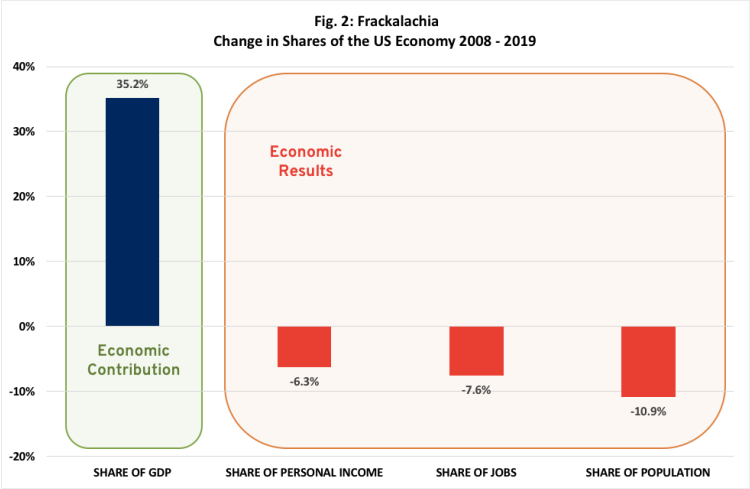
Between 2008 and 2019, twenty-two old industrial and rural counties in Ohio, Pennsylvania, and West Virginia, which make up the Appalachian natural gas region, increased their contribution to US gross domestic product (GDP) by more than one-third. In 2008, the 22 counties were responsible for $2.46 of every $1,000 of national output. By 2019, the figure had climbed to $3.33. Their rate of GDP growth more than tripled that of the nation. However, during the same period, measures of local economic prosperity—the economic impacts of that growth—not only failed to keep pace with the increased share of output, they actually declined.

- The 22 counties' share of the nation's personal income fell by 6.3%, from $2.62 for every $1,000 to just $2.46.
- Their share of jobs fell by 7.6%, from 2.62 in every 1,000 to 2.46.
- Their share of the nation's population fell by 10.9%, from 3.26 for every 1,000 Americans to 2.9 for every thousand.

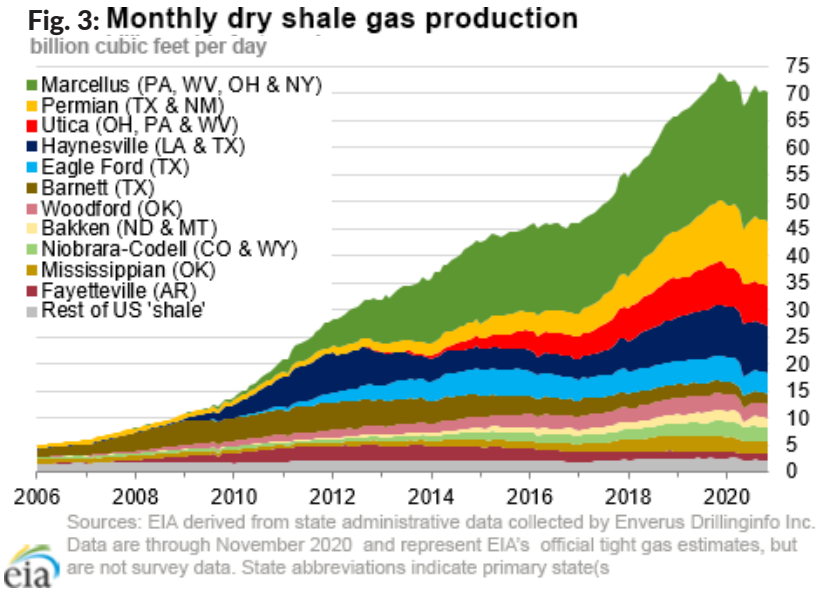
It is a case of economic growth without prosperity, the defining characteristic of the resource curse.

Most of the GDP increase in this group of counties was due to the Appalachian natural gas production boom, which was facilitated by the advent of a drilling technique called hydraulic fracturing, or "fracking" for short.



Between 2008 and 2019, Appalachia's Marcellus and Utica gas fields went from producing a negligible portion of the nation's natural gas to nearly 40%. The growth exceeded even the most optimistic expectations, which were laid out in a 2010 American Petroleum Institute economic impact study.

The API study projected the effects of three different development scenarios—low, medium, and high—on jobs, incomes, tax revenues, and other indicators of economic progress. The "high development" scenario hypothesized daily production from Marcellus wells of 18.4 billion cubic feet by the year 2020. In fact, by 2019, Marcellus gas wells in Pennsylvania and West Virginia were producing 25 bcf/day—fully 35% more than the "high development" scenario—while Utica field wells in Ohio, which were not considered in the API study, were producing an additional 6 bcf/day.



The unexpectedly high production should have compounded the economic benefits projected by the study, which found that nearly 44,000 new jobs would be created in West Virginia and 212,000 in Pennsylvania. And according to another economic impact study conducted by Kleinhenz and Associates, Ohio was supposed to see the creation of an additional 200,000 jobs.

At the time they were published, numerous policymakers in Ohio,

Pennsylvania, and West Virginia cited the API and Kleinhenz studies and called the coming natural gas production boom a "godsend" and "an economic game-changer" for a rustbelt region whose economy had been savaged first by the collapse of the steel industry and, more recently, by a suddenly declining coal industry. In West Virginia, one state legislator, noting that the job creation figure was greater than the state's total number of unemployed, happily proclaimed, "We'll have more jobs than people!"

But, by 2019, before the onset of the COVID-19 crisis, job creation in Appalachian fracking states was badly lagging that of the nation. Between 2008 and 2019 the number of jobs nationally increased by 10%, but in Ohio, Pennsylvania, and West Virginia, job growth was less than 4%. Remarkably, despite booming natural gas production, the 22 major gas-producing counties did even worse, with combined job growth of only 1.6%.

Fig. 4: Estimated Future Economic Impacts under Three Development Scenarios

Assumptions	Low Development* (E = 0.5, R/W = 1.5 bcf)			Medium Development (E = 1.0, R/W = 2.0 bcf)			High Development** (E = 2.7, R/W = 2.8 bcf)		
	2011	2015	2020	2011	2015	2020	2011	2015	2020
Wells Drilled	*Number of Wells*								
NY	0	0	0	42	314	340	52	406	502
PA	1,220	1,353	1,465	2,019	2,239	2,424	2,211	2,903	3,587
WVA	227	252	273	376	417	452	464	609	752
Total	1,447	1,605	1,738	2,436	2,970	3,216	2,727	3,918	4,842
NG Output	*Million cubic feet per day*								
NY	0	0	0	0	488	952	0	853	1,839
PA	1,353	2,246	3,360	1,802	4,579	7,161	2,522	7,607	13,457
WVA	227	488	677	376	948	1,406	464	1,713	2,916
Total	1,581	2,734	4,036	2,178	6,015	9,519	2,986	10,173	18,212
Value Added	*Millions of 2010 dollars*								
NY	0	0	0	153	1,705	1,941	171	2,250	2,910
PA	5,510	6,957	7,744	8,940	10,984	12,508	10,129	14,415	18,853
WVA	819	877	1,044	1,331	1,478	1,798	1,652	2,168	3,035
Total	6,329	7,835	8,788	10,424	14,166	16,247	11,952	18,833	24,798
S&L Taxes	*Millions of 2010 dollars*								
NY	0	0	0	19	214	246	22	283	369
PA	538	688	770	870	1,078	1,239	987	1,417	1,872
WVA	114	134	176	173	237	329	221	377	600
Total	652	822	945	1,063	1,530	1,814	1,243	2,134	2,991
Fed. Taxes	*Millions of 2010 dollars*								
NY	0	0	0	21	239	272	24	316	407
PA	724	913	1,016	1,176	1,443	1,641	1,332	1,893	2,473
WVA	97	104	125	158	176	215	196	259	364
Total	821	1,017	1,140	1,355	1,858	2,128	1,551	2,467	3,245
Employment	*Number of Jobs*								
NY	0	0	0	1,419	15,727	18,027	1,598	20,803	27,060
PA	60,755	77,788	87,119	98,222	121,816	140,169	111,413	160,205	211,909
WVA	11,405	12,332	14,856	18,437	20,864	25,810	22,928	30,675	43,746
Total	72,160	90,120	101,975	118,078	158,408	184,007	135,939	211,683	282,716

E = price elasticity of drilling, R/W = reserves per well,
* Assumes 30% reductions in Pennsylvania and West Virginia drilling during 2011 from 2010 levels.
** Uses survey estimate for planned spending in Pennsylvania in 2011

Timothy J. Considine. "The Economic Impacts of the Marcellus Shale: Implications for New York, Pennsylvania, and West Virginia. A report to the American Petroleum Institute," July 2010

Fig. 5: Economic Impacts of Utica Expenditures in Ohio
(not including impacts from royalty and lease expenditures)

Measure	2011	2012	2013	2014	2015
Employment	3,794	21,469	102,052	177,006	203,138
Gross Regional Product (2010$)	$180,490,801	$1,090,454,086	$5,382,507,950	$9,972,385,040	$12,265,597,116
Wages by Place of Work	$153,076,171	$955,291,749	$4,907,806,396	$9,412,658,692	$11,990,570,072
Output (2010$)	$336,442,364	$2,028,308,975	$9,987,537,682	$18,429,639,625	$22,583,274,738
Local Wage Tax (@2%)	$3,061,523	$19,105,835	$98,156,128	$188,253,174	$239,811,401

TKleinhenz & Associates. "Ohio's Natural Gas and Crude Oil Exploration and Production Industry and the Emerrging Utica Gas Formation. Economic Impact Study". September 2011.

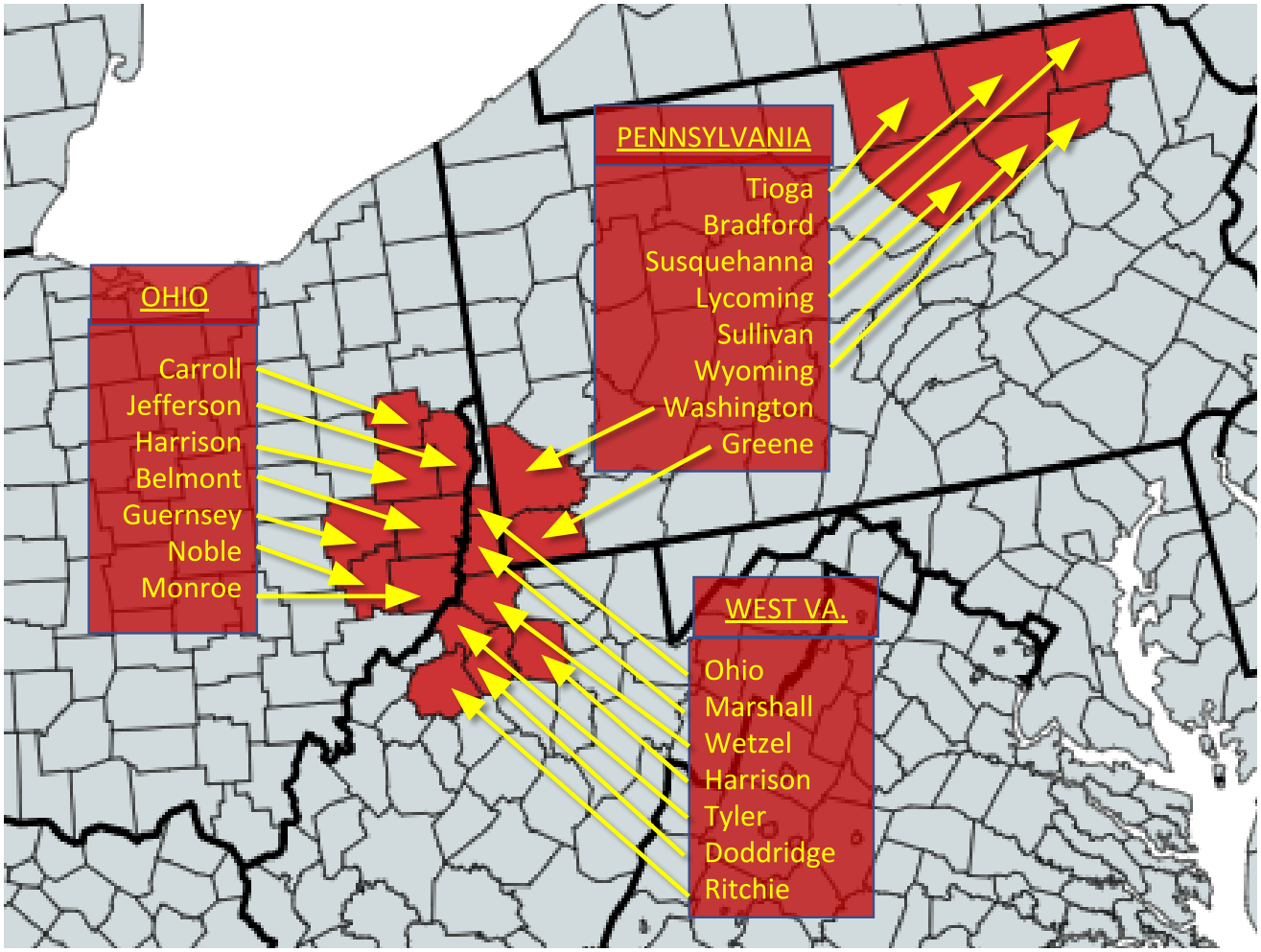
This extreme disconnect between economic output and local prosperity raises the question of whether the Appalachian natural gas industry is capable of generating or even contributing to broadly shared wellbeing. And, if it is not, should it continue to be the focus of local and regional economic development efforts?

It would be easier to answer these questions in the affirmative if, among the twenty-two counties, some portion of them had achieved economic outcomes roughly proportional to their increased contributions to the nation's economy and could provide examples of the kinds of circumstances and policies that might enable natural gas exploration and production to yield positive results. But sadly, there is little in the numbers to suggest that such a case exists.

Of the 22 major gas-producing Appalachian counties, none met or exceeded national performance for all three measures of prosperity—income, jobs, and population. And only two counties outperformed the nation for two measures. Still, some differences between the major gas-producing Appalachian counties are worth exploring.

WELCOME TO FRACKALACHIA

Although gas drilling takes place across Ohio, Pennsylvania, and West Virginia, just a few counties in two distinct regions—one in the upper Ohio River Valley and the other in northeastern Pennsylvania—are responsible for over 90% of all the gas produced in Appalachia. These counties, which we'll call "Frackalachia," represent just 10% of the land area of the three states and are home to less than 4% of the population.



They are distinguished from other counties in the region both by the volume of natural gas they produce and by the significance of natural gas and other extractive industries in their local economies. The NAICS sector that includes natural gas extraction represents 35% of GDP in the twenty-two counties. And in some counties, it constitutes more than two-thirds of GDP.

To qualify for this analysis and inclusion in Frackalachia, counties in Ohio, Pennsylvania, and West Virginia had to meet two criteria. First, they had to be responsible for at least 2% of their state's total production of natural gas. Second, they had to derive at least 6% of their GDP from the Mining, Quarrying, and Oil and Gas Extraction sector.

The following counties met both criteria:

- In Ohio: Belmont, Carroll, Jefferson, Guernsey, Harrison, Monroe, and Noble
- In Pennsylvania: Bradford, Greene, Lycoming, Sullivan, Susquehanna, Tioga, Washington, and Wyoming
- In West Virginia: Doddridge, Harrison, Marshall, Ohio, Ritchie, Tyler, and Wetzel

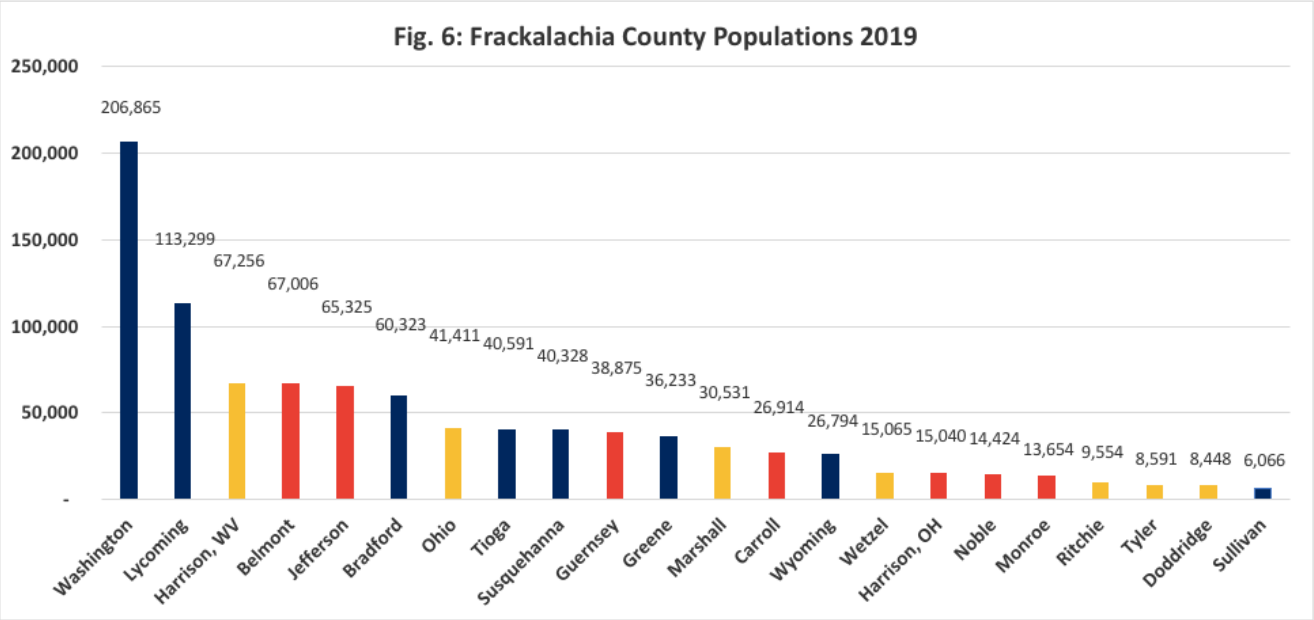
Among the counties failing to meet the selection criteria were Allegheny and Butler Counties in Pennsylvania, both of which produced a sufficient share of the state's natural gas at 3.4% and 2.2% respectively, but fell short of the GDP criterion. In West Virginia, Brooke and Monongalia Counties met the volume criterion but not the GDP criterion. And Columbiana County, Ohio, which is sometimes included in industry analyses of the Ohio natural gas industry, failed to meet both criteria.

Also failing to make the cut was Beaver County, Pennsylvania, where mining and natural gas extraction make up only 1.3% of GDP. However, some might argue for Beaver County's inclusion in Frackalachia on the grounds that it is the site of a new Royal Dutch Shell ethane cracker plant that is widely regarded as a major economic prize and a product of the region's natural gas boom.

That said, Beaver County's inclusion in Frackalachia would not have greatly altered the outcome. Beaver County experienced no job growth over the period. It's also noteworthy that, despite the presence of the Shell Cracker project, Beaver County's GDP grew by less than half that of the nation and less than a quarter that of Frackalachia.

Finally, when Pittsburgh/Allegheny County and its contiguous suburban counties are removed from the analysis, the differences between the remaining Frackalachian counties and their neighboring counties are small. Excluding Washington County, Pennsylvania, which, like Beaver County, borders on Allegheny County and includes Pittsburgh suburbs, the Frackalachian counties experienced a collective job growth rate of 1.3%. Meanwhile, their neighboring non-Frackalachian counties saw a slight decline of 0.3%, both far below state and national averages.

The counties that qualified for inclusion in Frackalachia have a combined 2019 population of 952,593. That is about the same number of people as reside in Delaware and greater than the numbers in South Dakota, North Dakota, Alaska, Vermont, Wyoming, and the District of Columbia. The total area of 12,013 square miles is slightly less than that of the state of Maryland.



Source: U.S. Bureau of Economic Analysis

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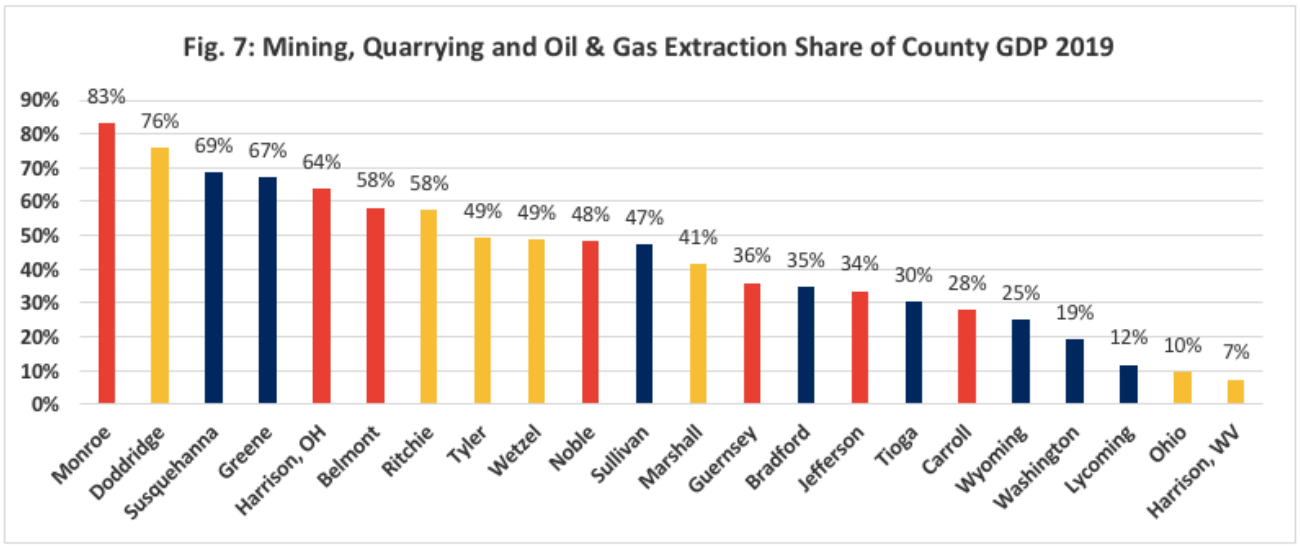
The share of GDP attributable to mining, quarrying, and oil and gas extraction in Frackalachian counties ranges from 83% in Monroe County, Ohio to just over 7% in Harrison County, West Virginia.



Source: U.S. Bureau of Economic Analysis

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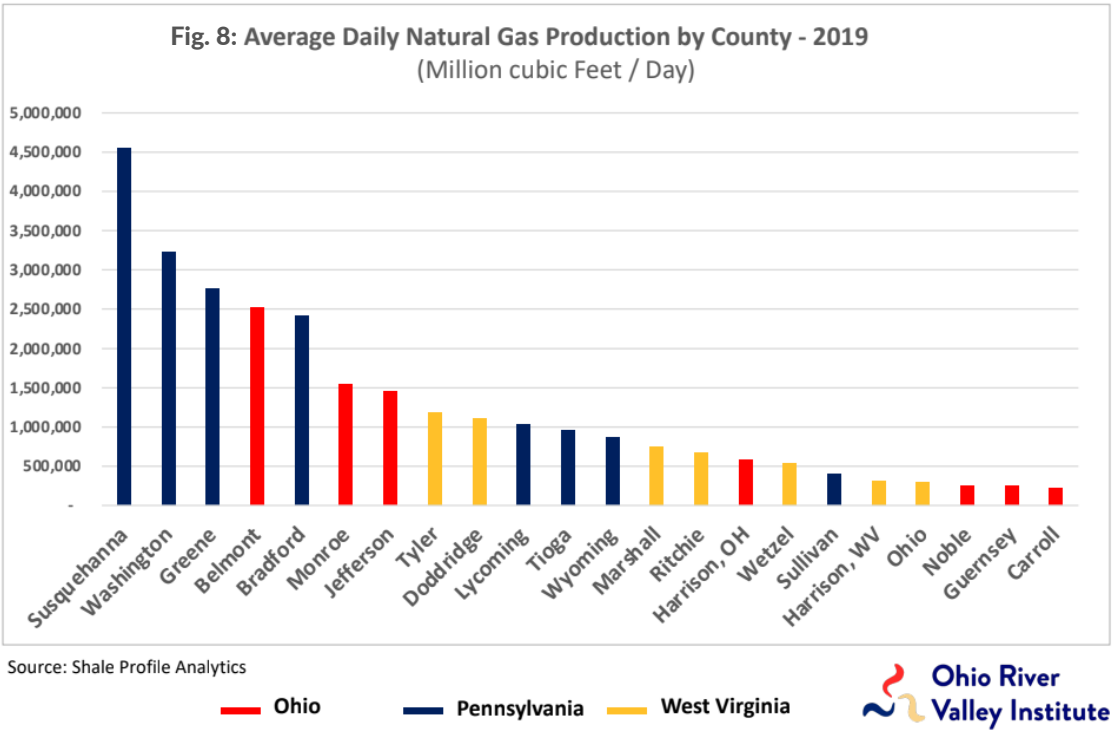
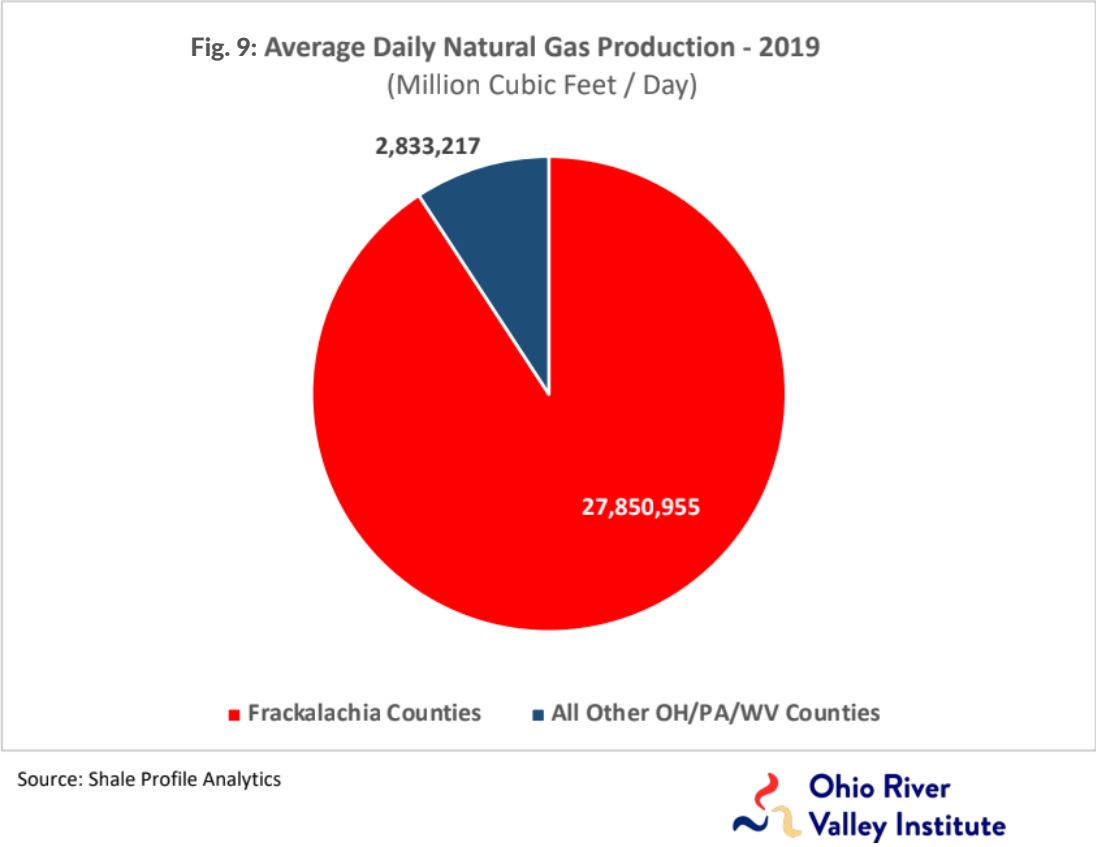


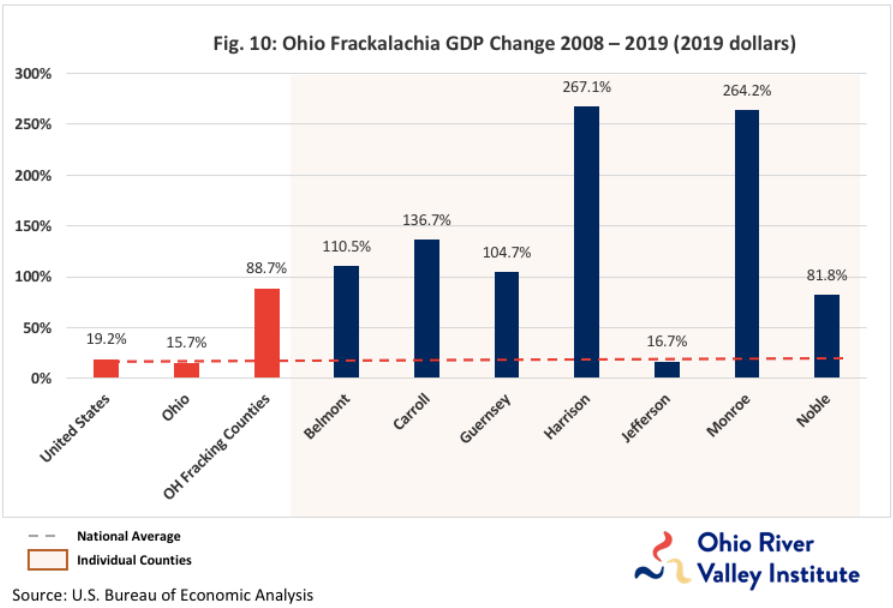
Collectively, the Frackalachian counties are responsible for just over 90% of the natural gas produced in Ohio, Pennsylvania, and West Virginia.



FRACKALACHIA'S ECONOMIC PERFORMANCE

Ohio

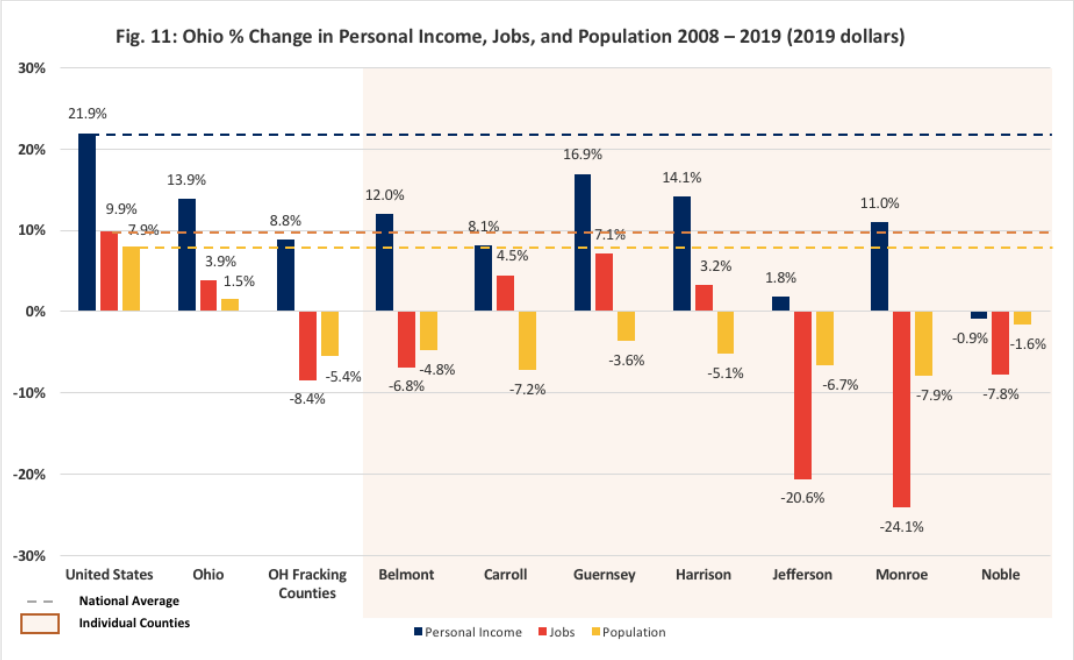
Ohio's Frackalachian counties have the distinction of being both the best performing among the three states for GDP growth relative to the state and the nation and also the worst performing for every measure of prosperity—personal income, jobs, and population. Although Ohio's GDP grew less than that of the nation, every Frackalachian county, save Jefferson, had a growth rate higher than the US average. And even Jefferson County's GDP growth was greater than the state's. In all, the GDP growth rate in Ohio Frackalachian counties was four times that of the nation and more than five times that of the state of Ohio.



Source: U.S. Bureau of Economic Analysis

But GDP performance failed to translate into significant gains in personal income, jobs, and population. None of the Ohio Frackalachian counties were close to the national average for personal income growth. And only two, Guernsey and Harrison, exceeded the state average. As a group, they were less than half the national average and a third below the state average.

Jobs performance was similarly disappointing. Both Ohio and its Frackalachian counties were far below the national growth rate of 9.9%. Statewide, jobs grew by 3.9%. The Frackalachian counties, on the other hand, experienced a decline in jobs of 8.4%, a loss of 6,777 jobs between 2008 and 2019. Monroe County and Jefferson County, which only slightly trails Belmont County as the most populous of the seven counties, were particularly hard-hit.



Sources: U.S. Bureau of Economic Analysis
QCEW Data: U.S. Bureau of Labor Statistics

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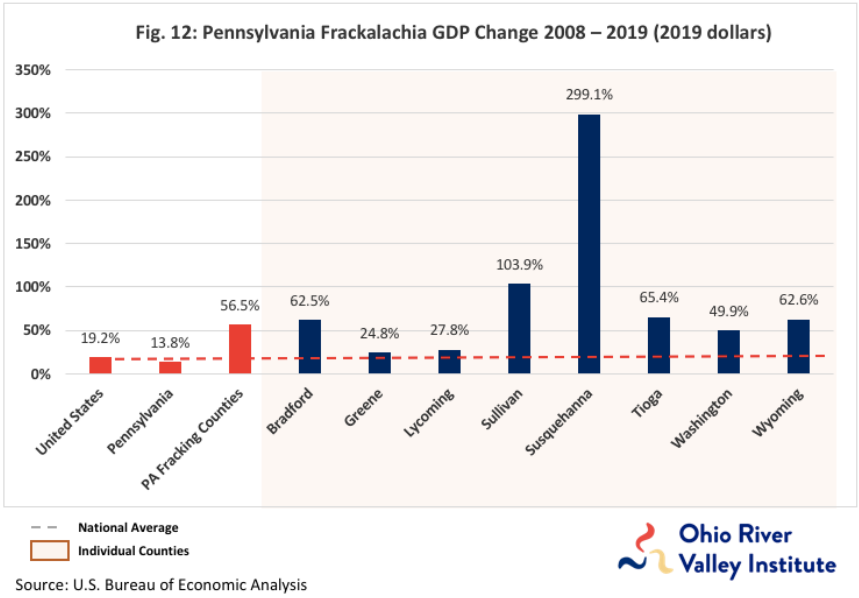
As with jobs performance, population growth in Ohio was anemic statewide at 1.5%. At least it was positive. The Ohio Frackalachian counties experienced a decline of 5.4%, or 13,795 residents out of a population of 241,238. None of the seven Ohio Frackalachian counties added residents.

Pennsylvania

GDP growth in Pennsylvania's fracking counties was almost three times that of the nation and more than four times the state's rate of growth. Susquehanna County, in the northeast corner of the state, nearly tripled the size of its economy over the eleven year period. And all of the fracking counties outperformed the nation and the state. Pennsylvania's Frackalachian counties also posted the best prosperity measures of the fracking counties in the three states.



Source: U.S. Bureau of Economic Analysis

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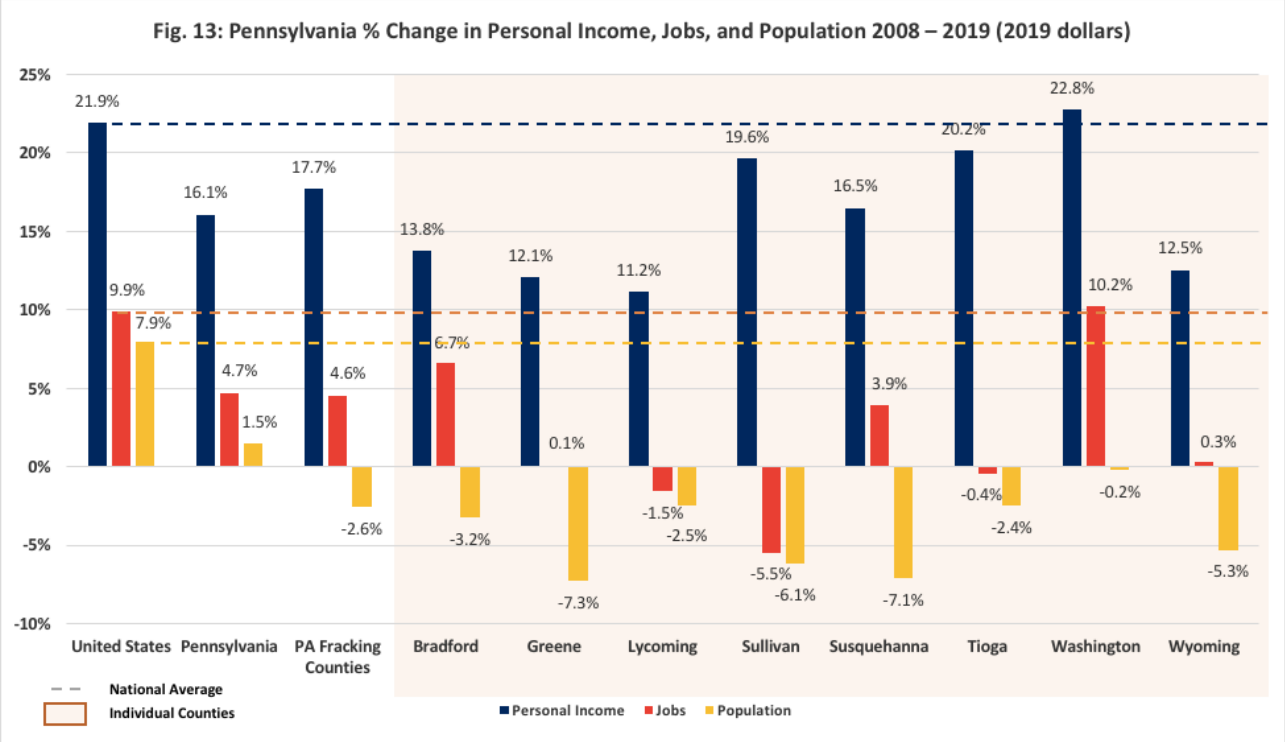
Personal income growth trailed the national average, but was slightly better than the state average. Washington County, which has by far the largest population among all Frackalachian counties, was the best performing with a rate of personal income growth that slightly exceeded that of the nation. Tioga, Susquehanna, and Sullivan Counties also exceeded the state, but not the national average.

Jobs growth in Pennsylvania's Frackalachian counties was less than half that of the nation and about the same as the state. Washington County matched national job growth. But five of the other seven Pennsylvania counties either gained very few jobs or experienced a loss.



Sources: U.S. Bureau of Economic Analysis
QCEW Data: U.S. Bureau of Labor Statistics

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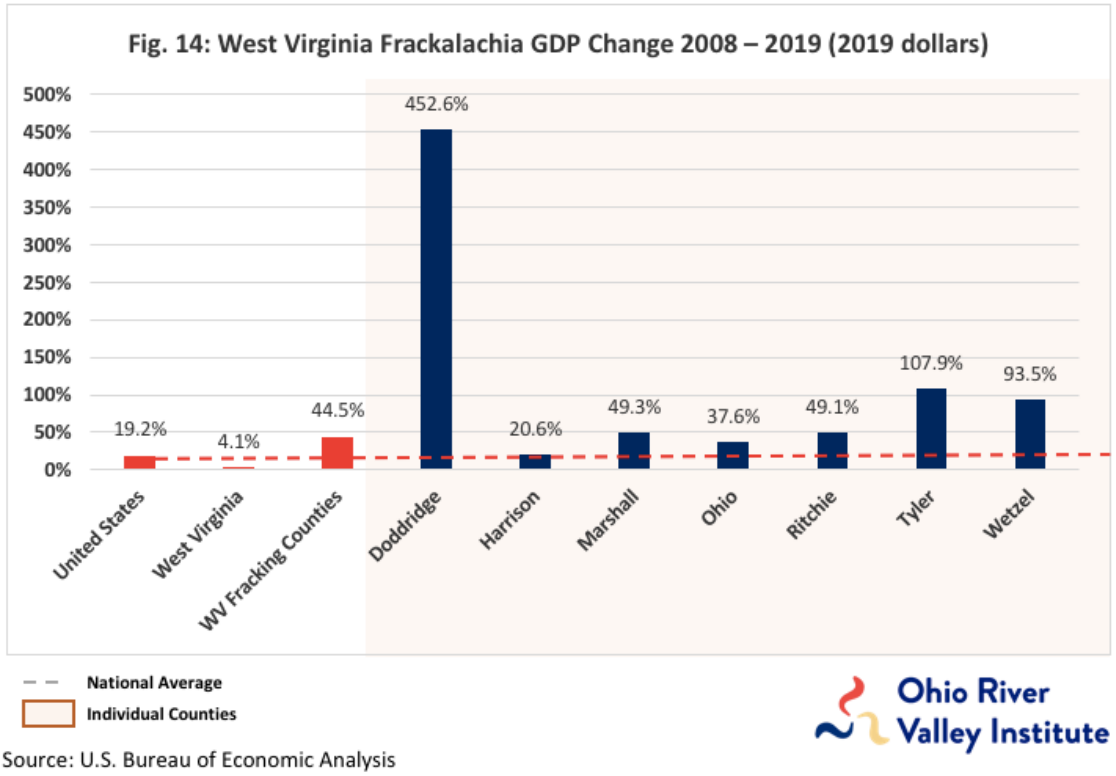
While Pennsylvania achieved a 1.5% population gain, its Frackalachian counties experienced a 2.6% decline, with Greene, Sullivan, and Wyoming Counties incurring the greatest losses. None of Pennsylvania's Frackalachian counties achieved a population gain.

West Virginia

West Virginia's Frackalachian counties' GDP growth was more than twice that of the nation and eleven times that of the state. It was led by rural Doddridge County, which saw GDP increase by over four times. However, all seven West Virginia Frackalachian counties had GDP growth rates in excess of the national average.



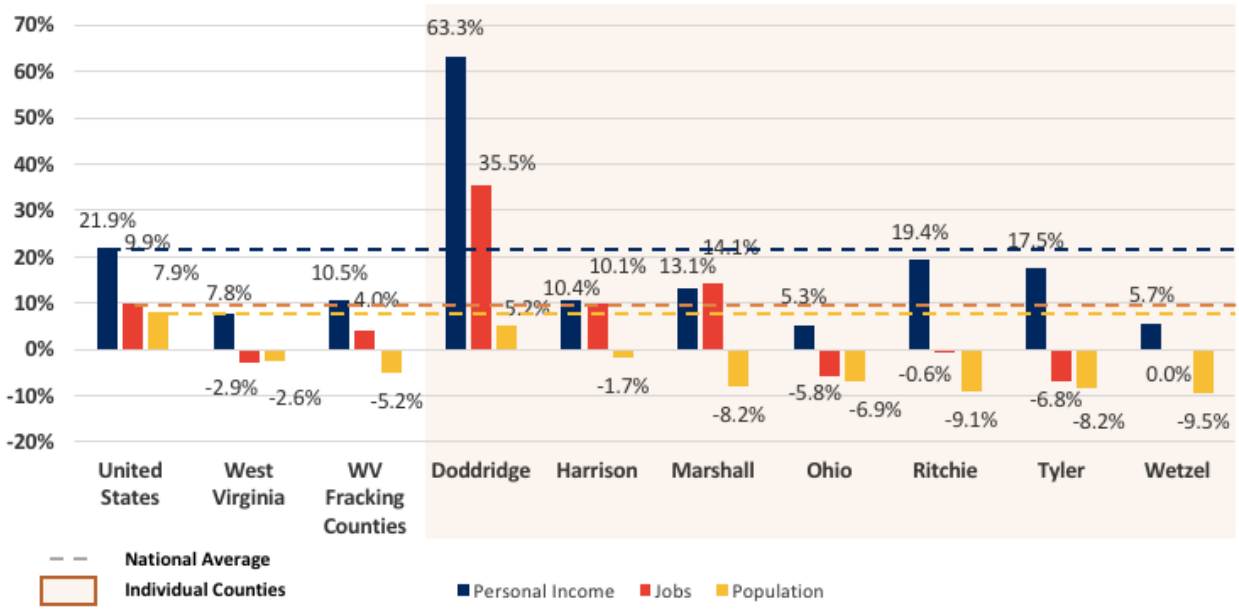
Source: U.S. Bureau of Economic Analysis

Doddridge County outperformed the nation on two measures of economic prosperity. However, with only 8,448 residents, Doddridge is the second smallest Frackalachian county, so its results carry relatively little weight in calculating the region's overall performance.

West Virginia's Frackalachian county personal income gains were comparable to those of Frackalachian counties in Ohio, but lagged well behind those in Pennsylvania. They were also about half of the national average. As with the other two measures of prosperity—jobs and population—Doddridge County was the only West Virginia Frackalachian county to exceed the national average. Five of West Virginia's seven Frackalachian counties exceeded the state average.

Jobs growth has been a chronic problem both for the state of West Virginia and its Frackalachian counties. Between 2008 and 2019, while the number of jobs nationally grew by 10%, West Virginia Frackalachian counties added only 4%. Still, that compares well to the state's overall performance, which produced a 2.9% drop in the number of jobs. On a percentage basis, Doddridge was again the big winner. However, in absolute numbers, Harrison County stood out by adding more than 3,300 jobs, an increase of 10%. How much of that is attributable to the natural gas boom is uncertain since the Mining, Quarrying, and Oil and Gas Extraction sector makes up only 7.4% of Harrison County's economy, the lowest figure among the Frackalachian counties.

Fig. 15: West Virginia % Change in Personal Income, Jobs, and Population 2008 – 2019 (2019 dollars)



Sources: U.S. Bureau of Economic Analysis
QCEW Data: U.S. Bureau of Labor Statistics

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Despite adding jobs in a state that otherwise lost them, West Virginia's Frackalachian counties could not do the same with population. Overall, West Virginia's population dropped by 2.6%. But its Frackalachian counties experienced a decline of 5.2%, nearly 10,000 people. Doddridge was the only West Virginia Frackalachian county to not experience population loss.

IMPLICATIONS

Despite a booming natural gas industry and skyrocketing GDP numbers, the vast majority of Frackalachian counties experienced economic stagnation or outright decline and depopulation. Even the counties that did relatively well—Washington County, Pennsylvania and Harrison and Doddridge Counties in West Virginia—are outliers.

Washington County includes the Pittsburgh suburbs and enjoys a significantly larger and more diverse economy than the other Frackalachian counties. Harrison County, West Virginia also has a larger and more diverse economy than other Frackalachian counties, with the Mining, Quarrying, and Oil and Gas Extraction sector generating only 7.4% of GDP. Doddridge County, on the other hand, was quite small and not heavily developed prior to the fracking boom.

In short, there is little in the numbers to support the contention that the Appalachian natural gas boom has been or can be an engine for economic prosperity. If high production volumes were capable of creating jobs and prosperity, it would have happened. And there is a great deal which suggests that, in some cases, the industry may have the opposite effect.

Exhibit A is Belmont County, Ohio, which has received more than a third of all natural gas investment in Ohio and which produces more than a third of the state's output. Also, the oil and gas sector makes up nearly 60% of the county's economy. Despite those gaudy numbers and a rise in GDP that was over five times the national rate, Belmont County experienced a nearly 7% decline in jobs and 5% decline in population between 2008 and 2019.

Belmont County is an extreme case of economic growth without prosperity. But, nowhere in Frackalachia other than in tiny Doddridge County, West Virginia, did gains in shares of income, jobs, and population come close to matching the region's contributions to economic output.

The question is, why? Various possibilities present themselves:

- Negative externalities:
    - In addition to contributing to the problem of global warming, natural gas fracking is a major source of local air and water pollution and noise pollution, which can impact the health and quality of life of nearby residents. Fracking also increases stress on local infrastructure, particularly roads, which results in greater costs for local governments. All of these are potential deterrents to families and businesses trying to decide whether or not to stay or locate in Frackalachian counties.

- Structural economic factors:

  - *The boom/bust nature of extractive industries increases risks for other businesses that would otherwise contemplate starting up or expanding.* Communities and surrounding businesses that are economically dependent on extractive industries can see their fortunes suddenly rise or fall in response to volatile commodity prices, creating an added barrier to location or expansion. The issue is explored in greater detail by Ohio State University economist Dr. Mark Partridge in a January 2019 presentation titled “Best Practice Energy Development," which was prepared for the Center for Strategic and International Studies Workshop on Energy as a Source of Economic Growth and Social Stability.

  - *Labor’s share of the income generated by the natural gas industry is comparatively low.* While fracking generates a great deal of revenue that counts toward GDP, the portion of revenue allocated to labor in the form of wages and salaries is smaller than that of most industries. In the economy generally, a little more than half of all income is allocated to wages and salaries. But the figure for extractive industries is less than half that. A recent analysis by Ted Boettner of the Ohio River Valley Institute found that, in Belmont County, Ohio, the figure is only about 12%, which means the industry’s contributions to direct employment and wages are modest compared to expectations.

  - *Capital income has been disappointing and much of the capital income that is realized is exported out of local economies.* Most of the revenue generated by fracking is allocated to capital. Some of that goes to local property owners in the form of royalties. However, because natural gas prices have been persistently lower than originally projected, royalty income has been significantly less than economic impact studies once assumed. Also, low gas prices have reduced the amount of capital income that was expected to flow to company owners and shareholders. Finally, most owners and shareholders of oil and natural gas extraction companies live outside the region.

  - *The sourcing of labor and materials may also be heavily exported.* Industry boosters frequently trumpet the amount of money the industry is “investing in the community”. However, these figures, which often run into the billions of dollars, include many purchases which are made from suppliers outside the region. Therefore, those dollars never actually enter local economies. That’s true of much of the materials, equipment, and infrastructure with which local infrastructure is built. It’s true as well of workers, many of whom are brought in temporarily from other places such as the Gulf Coast states where many drilling services companies are based.

- *The economic benefits of added jobs and income are diluted in the region's smaller economies.* As noted earlier, the Frackalachian counties represent about 10% of the land area of Ohio, Pennsylvania, and West Virginia, but contain only about 4% of the population. Consumers in sparsely populated places are more likely to have to go outside of their communities to make some purchases. This dilutes the local economic impact of any gains in jobs and incomes.

- *Chronically low commodity prices.* As mentioned earlier, low prices for natural gas and natural gas liquids reduce revenue and income to capital. Since the fracking boom began, the price of gas has plunged from levels above $8 per million btu to levels below $3 and has remained mired there for years. With opportunities for natural gas to replace coal-fired power generation diminishing and in the face of increasing measures to reduce greenhouse gas emissions, it is possible that demand for natural gas will stagnate or at least be unable to outstrip production capacity, in which case prices and margins may not see significant improvement.

- *Limited opportunities for downstream value-adding development.* Since the Appalachian fracking boom began, later economic impact studies, such as one done in 2017 by the American Petroleum Institute, have anticipated massive job expansion resulting from regional growth of downstream industries, including petrochemical and plastics manufacturing. The expected expansion has largely failed to materialize. Of the nine major projects anticipated in the 2017 ACC study, only one—an ethane cracker plant in Pennsylvania—has been greenlighted. At the same time, production capacity along the Gulf Coast and in China and the Middle East has been exploding, creating an overabundance of supply. Also, concerns about climate change and plastics pollution are threatening the size of expected increases in demand for plastics. As a result, the prospects for major expansions in downstream industries in Appalachia are at best uncertain and dim overall.

- A failure of tax and fiscal policies to capture an adequate share of income for states and communities:

  - One of the ways in which the challenges cited above can be mitigated or offset is for states, counties, and municipalities to levy taxes in order to capture and inject into local economies a greater share of revenues. However, in the belief that natural gas development could produce significant gains in jobs, many jurisdictions reduced taxes and provided incentives that reduced the amount of revenue they realized.

These and other factors should be studied and quantified in order to determine their significance and whether they can be mitigated or offset through policy measures. In the meantime, and in the absence of policies to offset or mitigate these forces, policymakers should look very critically at proposals to expand or otherwise assist the natural gas industry, which has yet to demonstrate that it is capable of contributing positively locally or on a large scale to the states and counties where it is most prevalent.

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DATA TABLES

REAL GDP (in thousands of 2019 dollars)				
	2008	2019	Change	% Change
West Virginia				
Doddridge	$160,450	$886,689	$726,239	452.6%
Harrison	$3,864,833	$4,660,093	$795,260	20.6%
Marshall	$1,742,832	$2,602,797	$859,965	49.3%
Ohio	$2,920,781	$4,017,785	$1,097,004	37.6%
Ritchie	$417,874	$623,029	$205,155	49.1%
Tyler	$292,891	$608,823	$315,932	107.9%
Wetzel	$376,459	$728,552	$352,093	93.5%
	$9,776,118	**$14,127,768**	**$4,351,650**	**44.5%**
Ohio				
Belmont	$2,527,261	$5,319,382	$2,792,121	110.5%
Carroll	$659,355	$1,560,158	$900,803	136.6%
Guernsey	$1,389,868	$2,844,818	$1,454,950	104.7%
Harrison	$433,811	$1,592,524	$1,158,713	267.1%
Jefferson	$4,027,339	$4,701,512	$674,173	16.7%
Monroe	$605,131	$2,203,737	$1,598,606	264.2%
Noble	$375,901	$683,502	$307,601	81.8%
	$10,018,666	**$18,905,633**	**$8,886,967**	**88.7%**
Pennsylvania				
Bradford	$2,669,642	$4,337,040	$1,667,398	62.5%
Greene	$3,422,559	$4,271,638	$849,079	24.8%
Lycoming	$5,026,176	$6,423,825	$1,397,649	27.8%
Sullivan	$235,532	$480,217	$244,685	103.9%
Susquehanna	$965,220	$3,852,120	$2,886,900	299.1%
Tioga	$1,246,637	$2,062,358	$815,721	65.4%
Washington	$9,594,037	$14,739,057	$5,145,020	53.6%
Wyoming	$1,280,119	$2,081,428	$801,309	62.6%
	$24,439,922	**$38,247,683**	**$13,807,761**	**56.5%**
Frackalachia	**$44,234,706**	**$71,281,084**	**$27,046,378**	**61.1%**
Region				
Ohio	$600,942,842	$695,362,000	$94,419,158	15.7%
Pennsylvania	$710,858,605	$808,738,000	$97,879,395	13.8%
West Virginia	$75,781,466	$78,864,000	$3,082,534	4.1%
Total	**$1,387,582,912**	**$1,582,964,000**	**$195,381,088**	**14.1%**
% of Region	**3.188%**	**4.503%**	**13.843%**	
% of US	0.246%	0.333%		
US	$17,984,981,728	**$21,433,826,000**	**$3,448,844,272**	**19.2%**
Share Change		**35.2%**		

EMPLOYMENT				
	2008	2019	Change	% Change
West Virginia				
Doddridge	1,166	1,580	414	35.5%
Harrison	33,491	36,860	3,369	10.1%
Marshall	10,576	12,067	1,491	14.1%
Ohio	30,010	28,273	(1,737)	-5.8%
Ritchie	3,170	3,151	(19)	-0.6%
Tyler	2,238	2,086	(152)	-6.8%
Wetzel	4,426	4,425	(1)	0.0%
	85,077	**88,442**	**3,365**	**4.0%**
Ohio				
Belmont	23,751	22,126	(1,625)	-6.8%
Carroll	6,002	6,271	269	4.5%
Guernsey	14,136	15,145	1,009	7.1%
Harrison	3,580	3,696	116	3.2%
Jefferson	26,052	20,682	(5,370)	-20.6%
Monroe	3,835	2,909	(926)	-24.1%
Noble	3,223	2,973	(250)	-7.8%
	80,579	**73,802**	**(6,777)**	**-8.4%**
Pennsylvania				
Bradford	21,506	22,938	1,432	6.7%
Greene	12,829	12,842	13	0.1%
Lycoming	52,006	51,213	(793)	-1.5%
Sullivan	1,575	1,489	(86)	-5.5%
Susquehanna	8,875	9,222	347	3.9%
Tioga	12,759	12,706	(53)	-0.4%
Washington	80,207	88,389	8,182	10.2%
Wyoming	9,546	9,576	30	0.3%
	199,303	**208,375**	**9,072**	**4.6%**
Frackalachia	**364,959**	**370,619**	**5,660**	**1.6%**
Region				
Ohio	5,235,972	5,439,352	203,380	3.9%
Pennsylvania	5,658,771	5,925,588	266,817	4.7%
West Virginia	709,657	688,761	(20,896)	-2.9%
Total	**11,604,400**	**12,053,701**	**449,301**	**3.9%**
% of Region	**3.145%**	**3.075%**	**1.260%**	
% of US	0.271%	0.250%		
US	**134,805,659**	**148,105,092**	**13,299,433**	**9.9%**
Share Change		**-7.6%**		

REAL PERSONAL INCOME (in thousands of 2019 dollars)				
	2008	2019	Change	% Change
West Virginia				
Doddridge	$156,109	$254,905	$98,796	63.3%
Harrison	$3,032,510	$3,348,906	$316,396	10.4%
Marshall	$1,149,968	$1,300,463	$150,495	13.1%
Ohio	$2,535,737	$2,669,377	$133,640	5.3%
Ritchie	$318,710	$380,518	$61,808	19.4%
Tyler	$291,410	$342,465	$51,055	17.5%
Wetzel	$525,676	$555,513	$29,837	5.7%
	$8,010,121	**$8,852,147**	**$842,026**	**10.5%**
Ohio				
Belmont	$2,570,795	$2,880,384	$309,589	12.0%
Carroll	$1,016,272	$1,098,976	$82,704	8.1%
Guernsey	$1,383,334	$1,617,701	$234,367	16.9%
Harrison	$516,848	$589,698	$72,850	14.1%
Jefferson	$2,621,382	$2,668,130	$46,748	1.8%
Monroe	$451,138	$500,722	$49,584	11.0%
Noble	$403,335	$399,595	-$3,740	-0.9%
	$8,963,103	**$9,755,206**	**$792,103**	**8.8%**
Pennsylvania				
Bradford	$2,289,588	$2,605,419	$315,831	13.8%
Greene	$1,460,233	$1,636,304	$176,071	12.1%
Lycoming	$4,579,764	$5,091,802	$512,038	11.2%
Sullivan	$240,598	$287,864	$47,266	19.6%
Susquehanna	$1,617,875	$1,884,828	$266,953	16.5%
Tioga	$1,418,436	$1,704,411	$285,975	20.2%
Washington	$10,157,511	$12,472,842	$2,315,331	22.8%
Wyoming	$1,121,290	$1,261,969	$140,679	12.5%
	$22,885,295	**$26,945,439**	**$4,060,144**	**17.7%**
Frackalachia	**$39,858,518**	**$45,552,792**	**$5,694,274**	**14.3%**
Region				
Ohio	$515,134,100	$586,783,961	$71,649,861	13.9%
Pennsylvania	$639,995,678	$742,924,296	$102,928,618	16.1%
West Virginia	$70,316,987	$75,834,630	$5,517,643	7.8%
Total	**$1,225,446,765**	**$1,405,542,887**	**$180,096,122**	**14.7%**
% of Region	**3.253%**	**3.241%**	**3.162%**	
% of US	0.262%	0.246%		
US	$15,204,855,405	**$18,542,262,000**	**$3,337,406,595**	**21.9%**
Share Change		**-6.3%**		

POPULATION				
	2008	2019	Change	% Change
West Virginia				
Doddridge	8,034	8,448	414	5.2%
Harrison	68,441	67,256	(1,185)	-1.7%
Marshall	33,248	30,531	(2,717)	-8.2%
Ohio	44,469	41,411	(3,058)	-6.9%
Ritchie	10,516	9,554	(962)	-9.1%
Tyler	9,363	8,591	(772)	-8.2%
Wetzel	16,645	15,065	(1,580)	-9.5%
	190,716	**180,856**	**(9,860)**	**-5.2%**
Ohio				
Belmont	70,356	67,006	(3,350)	-4.8%
Carroll	28,999	26,914	(2,085)	-7.2%
Guernsey	40,347	38,875	(1,472)	-3.6%
Harrison	15,856	15,040	(816)	-5.1%
Jefferson	69,989	65,325	(4,664)	-6.7%
Monroe	14,833	13,654	(1,179)	-7.9%
Noble	14,653	14,424	(229)	-1.6%
	255,033	**241,238**	**(13,795)**	**-5.4%**
Pennsylvania				
Bradford	62,318	60,323	(1,995)	-3.2%
Greene	39,074	36,233	(2,841)	-7.3%
Lycoming	116,147	113,299	(2,848)	-2.5%
Sullivan	6,462	6,066	(396)	-6.1%
Susquehanna	43,405	40,328	(3,077)	-7.1%
Tioga	41,609	40,591	(1,018)	-2.4%
Washington	207,240	206,865	(375)	-0.2%
Wyoming	28,294	26,794	(1,500)	-5.3%
	544,549	**530,499**	**(14,050)**	**-2.6%**
Frackalachia	**990,298**	**952,593**	**(37,705)**	**-3.8%**
Region				
Ohio	11,515,391	11,689,100	173,709	1.5%
Pennsylvania	12,612,285	12,801,989	189,704	1.5%
West Virginia	1,840,310	1,792,147	(48,163)	-2.6%
Total	**25,967,986**	**26,283,236**	**315,250**	**1.2%**
% of Region	**3.814%**	**3.624%**	**-11.960%**	
% of US	0.326%	0.290%		
US	**304,093,966**	**328,239,523**	**24,145,557**	**7.9%**
Share Change		**-10.9%**		

MINING, QUARRYING, AND OIL & GAS EXTRACTION SHARE OF GDP (in thousands of 2019 dollars)			
	GDP	MINING	% SHARE
West Virginia			
Doddridge	$886,689	$672,053	75.8%
Harrison	$4,660,093	$345,561	7.4%
Marshall	$2,602,797	$1,078,013	41.4%
Ohio	$4,017,785	$389,503	9.7%
Ritchie	$623,029	$358,764	57.6%
Tyler	$608,823	$300,781	49.4%
Wetzel	$728,552	$355,567	48.8%
	$14,127,768	**$3,500,242**	**24.8%**
Ohio			
Belmont	$5,319,382	$3,098,757	58.3%
Carroll	$1,560,158	$434,115	27.8%
Guernsey	$2,844,818	$1,023,441	36.0%
Harrison	$1,592,524	$1,016,755	63.8%
Jefferson	$4,701,512	$1,580,370	33.6%
Monroe	$2,203,737	$1,830,714	83.1%
Noble	$683,502	$331,396	48.5%
	$18,905,633	**$9,315,548**	**49.3%**
Pennsylvania			
Bradford	$4,337,040	$1,510,499	34.8%
Greene	$4,271,638	$2,877,825	67.4%
Lycoming	$6,423,825	$753,872	11.7%
Sullivan	$480,217	$227,784	47.4%
Susquehanna	$3,852,120	$2,645,974	68.7%
Tioga	$2,062,358	$626,828	30.4%
Washington	$14,739,057	$2,849,245	19.3%
Wyoming	$2,081,428	$521,068	25.0%
	$38,247,683	**$12,013,095**	**31.4%**
Frackalachia	**$71,281,084**	**$24,828,885**	**34.8%**

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