



SHALE INVESTMENT LIST ANALYSIS

As a part of the OHIO Shale Innovation Project, an interdisciplinary research effort examining the impacts of oil and gas development on the Marcellus and Utica shale regions, Ohio University researchers are analyzing the impacts of shale investment on the region's ability to create, capture, and retain wealth from the industry as an approach to smoothing the volatility that comes with the industry's boom and bust cycles. Included in this effort is the following analysis.

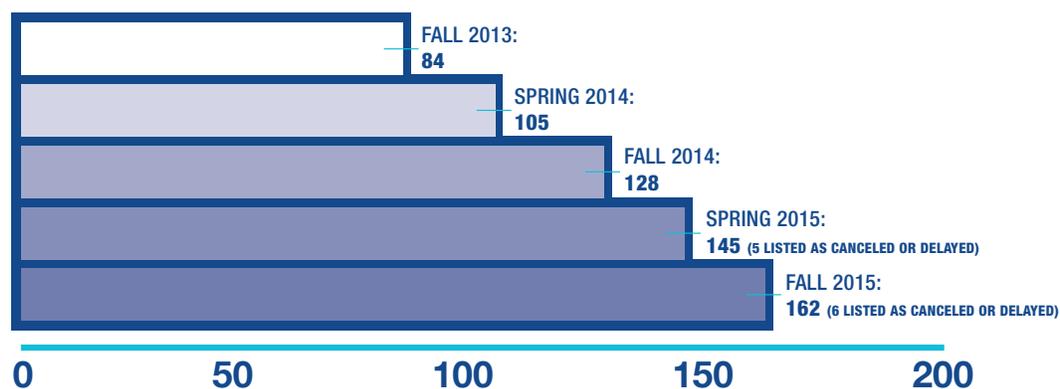
As a regional partner also working to determine the impact of shale development on economic development activities, Bricker & Eckler, a law firm based in Columbus Ohio, began publishing lists of announced shale-related economic development projects within the state, starting in the Fall of 2013.

The lists include midstream and downstream shale economic development project descriptions, the counties impacted by each project, the company (or companies) developing each project, and the estimated investment value in US dollars for each project (if reported by the company responsible for the project).

Researchers at Ohio University were interested in further analyzing this dataset for two reasons: 1) to better understand the trends in shale investment in Ohio, and 2) to analyze and quantify midstream development opportunities within the Marcellus and Utica shale plays. By searching and reviewing company press releases, Federal Energy Regulatory Commission (FERC) filings, regional newspaper stories, and Securities and Exchange Commission (SEC) annual 10-K filings, the researchers examined the status of each project in these Bricker & Eckler lists using the following questions:

- Does the project represent development of physical infrastructure or a service?
- What type of development project is this (e.g., pipeline, hotel, investment service, etc.)?
- Has the project come to fruition or not (by time of analysis)?
- If the project has come to fruition, is it complete and finalized or still in development (by time of analysis)?
- Does the project represent primary, secondary, or indirect economic development (relative to the shale industry)?
- Is an investment amount for the project listed?
- Did missing data prevent the researchers from confirming 1) whether the project has come to fruition, or 2) whether the project is complete and finalized or still in development?
- In which Bricker & Eckler document did the project first appear, and in which subsequent documents did it appear?

SHALE ECONOMIC DEVELOPMENT PROJECT LISTS





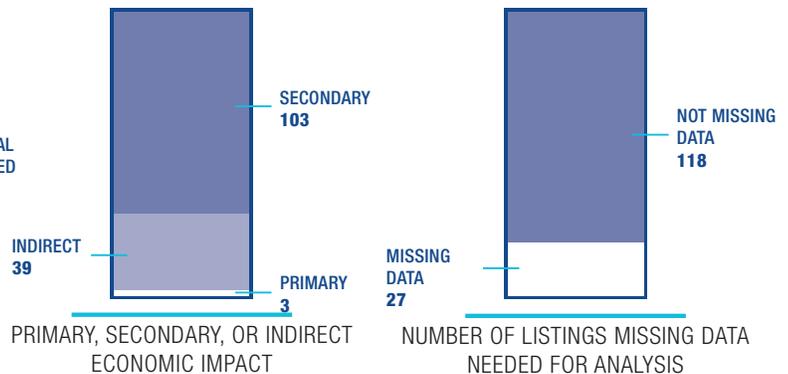
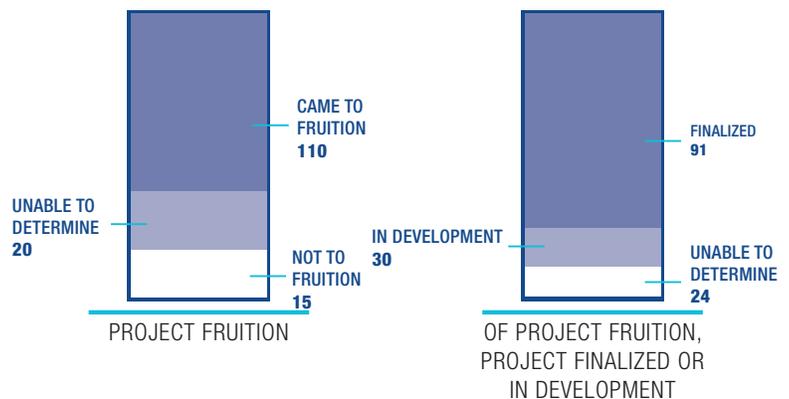
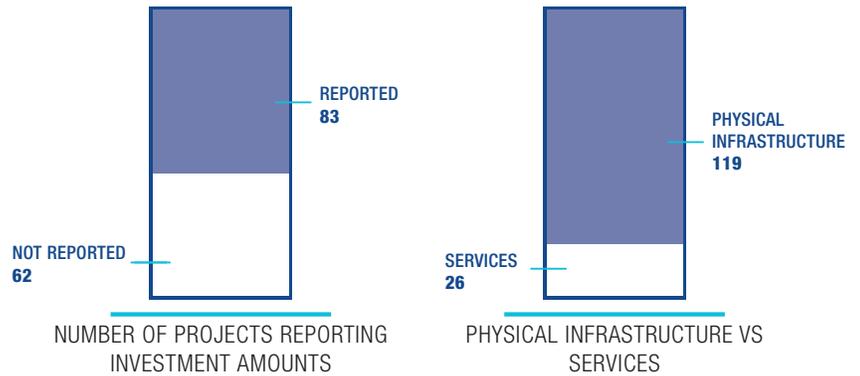
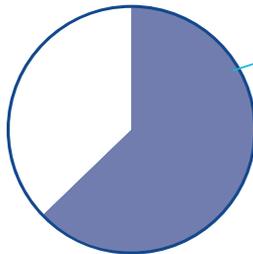
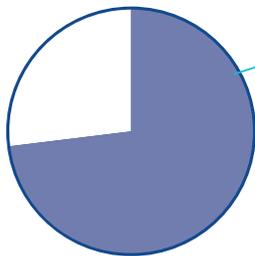
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KEY FINDINGS

INVESTMENT

- TOTAL INVESTMENT
\$24,388,664,407
- MAXIMUM INVESTMENT
\$4,400,000,000
- AVERAGE INVESTMENT
\$325,182,192
- MEDIAN INVESTMENT
\$13,200,000
- MINIMUM INVESTMENT
\$100,000

ASSOCIATION WITH EXISTING OIL AND GAS INFRASTRUCTURE



ANALYSIS

The OHIO researchers used the presence of Ohio Department of Natural Resources permit approvals prior to 2010 as a signal that a county had existing oil and gas infrastructure before the boom in shale development started in 2011. The researchers' hypothesis was that having previous oil and gas infrastructure within a county made it more likely for that county to experience investment in shale development. The results above indicate that counties with existing oil and gas infrastructure were indeed highly likely to experience investment in shale development. It also indicates that new shale technology induced infrastructure development in and of itself, explained by the 63.2% of counties listed with no well permit approvals prior to 2010. These findings provide valuable insight into the spillover effects that may exist as a result of having already established oil and gas infrastructure. Knowing that industry clustering may occur within counties that already have infrastructure established is informative when determining broader approaches for building and retaining wealth within the Marcellus and Utica shale regions.

Developed by Jonathan Norris, Ohio University Voinovich School of Leadership and Public Affairs with Daniel H. Karney, Ph.D., Ohio University Department of Economics, 2018. The Shale Innovation Project is an interdisciplinary collaboration between the Ohio University Russ College of Engineering and Technology, the Voinovich School of Leadership and Public Affairs and the College of Arts and Sciences examining the impact of shale development on businesses and communities in Ohio's shale region. This project is generously supported by a three-year Innovation Strategy Award from the Ohio University Research Division. The authors would like to thank Bricker & Eckler for access to this data for purposes of this project.