THE ECONOMICS OF FRAC SAND MINING

UNIVERSITY OF WISCONSIN-EXTENSION, COOPERATIVE EXTENSION

STABILITY OF MINING AS AN INDUSTRY

One of the issues that have been widely discussed within the context of the mining industry is that of economic stability. The notion of economic "boom-and-bust" is most often associated with the mining industry. This is most commonly associate with more remote rural areas where the opening of a mining operation spurs a spike, or boom, in employment and activity within the nearest community. By their very nature mines have a finite life and will eventually be closed. Because there tends to be limited employment opportunities once the mine closes people tend to migrate out of the region in search of other employment opportunities. The bust often leaves the community in a position worse than before the mine opened.

Another form of the "boom-and-bust" cycle that characterizes some mining operations is the "flickering" of operations. Depending on the commodity prices of the material being mined the operations of the mine may be shut-down for periods of time. As commodity prices flicker employment at the mine also flickers. This pattern can create instability in the local economy.

In this factsheet we explore the stability of the mining industry using national data along with growth patterns for U.S. counties that are deemed to be mining dependent. Consider first the stability in the value added for the whole of the U.S. economy and that of the mining industry (Figure 1). Value added is a comprehensive measure of income and is a major determinant of Gross Domestic Production (GDP). By examining the percent change from one year to the next we can gain insights into how stable the national mining industry is relative to the whole of the U.S. economy. A simple visual examination of the national industry from 1947 to 2010 reveals that the mining industry does indeed tend to be relatively unstable compared to the whole of the economy (Figure 1).

If we examine month to month changes in employment from January 1951 to November 2011 we can see a clear pattern of "boom-bust" in the mining industry up to the early 1980s (Figure 2). Over the past 30 years the strong national swings in the industry have stabilized. Consistent with the annual value added data, there is still some evidence that the mining industry is still more unstable than the overall economy. Note that this monthly employment data combines the mining and logging industries. While this monthly data gives us some additional insights this is still insufficient evidence to draw any

Figure 1: National Value Added Income: Annual Growth Rate Adjusted for Inflation

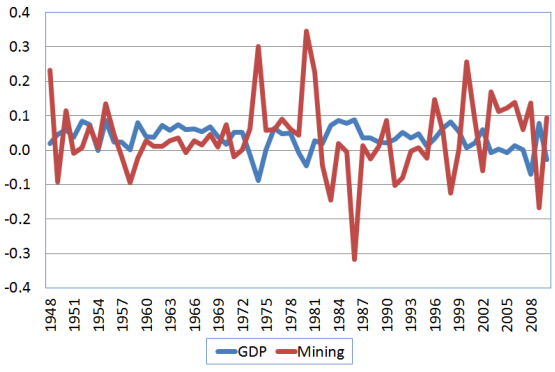
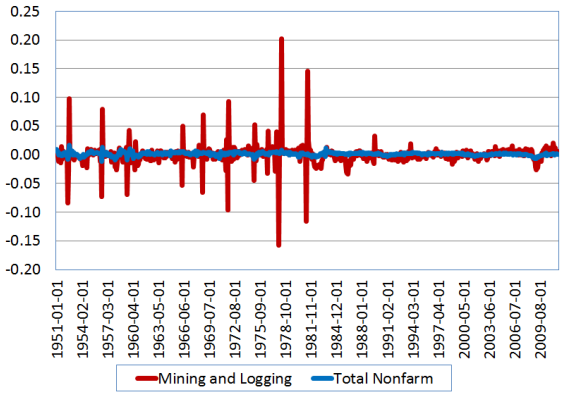


Figure 2: National Employment Growth Rate



Who We Are:

With an office in each Wisconsin county, Cooperative Extension develops practical educational programs tailored to local needs and based on university knowledge and research. We deliver our expertise to the public, addressing a wide range of needs to people, plants and animals, in both urban and rural areas of the states.

What We Do:

We teach, learn, lead and serve, connecting people with the University of Wisconsin, and engaging with them in transforming lives and

http://www.uwex.edu/about/cooperative.html

UW Extension
Cooperative Extension

conclusions.

To gain additional insights we looked at the annual growth rate from 1969 to 2009 for all nonmetropolitan counties compared to those counties deemed "mining counties" by the US Department of Agriculture. By comparing the median average annual growth rates and the variance of those growth rates across five different metrics of economic growth we can further test the stability question. The variance capture the distribution around the average growth rate and is a very simple measure of stability: higher variance levels suggest higher levels of instability. We find that indeed mining dependent counties have higher levels of instability in population, per capita income and job growth. We also find somewhat lower levels of instability in earnings growth and no differences in earnings per job growth.

The results of the simple analysis presented here suggest that the introduction of a large mining industry into the local economy can introduce certain levels of instability. The challenge facing communities who wish to pursue mining as an economic development strategy is developing contingency plans to mitigate for any increased instability.

Growth and Stability of Mining Dependent U.S. Counties

	Mining Dependent	Other Non-Metro	Median (Chi-Square)
Population Growth	0.0049	0.0049	0.361
Population Growth Stability	0.0262	0.0157	***50.757***
Per Capita Income Growth	0.0684	0.0669	***8.024***
Per Capita Income Growth Stability	0.0751	0.0706	***35.079***
Earnings Growth	0.0718	0.0701	0.892
Earnings Growth Stability	0.1257	0.1311	***29.243***
Job Growth	0.0157	0.0123	***4.605***
Job Growth Stability	0.0557	0.0342	***75.160***
Earnings per Job Growth	0.0533	0.0570	0.066
Earnings per Job Growth Stability	0.0872	0.1187	0.184

Significant at 95% level is bold and italics.

When considering the development of a sand mine there are several issues that the community should consider. These range from the potential economic benefits associated with employment opportunities to the compatibility of open pit mines with tourism and environmental concerns. When considering these issues it is important that local elected decision-makers and concerned citizens have access to the best information available. This series of factsheets is aimed at providing some insights into a range of issues surrounding the development of frac sand mines.