

Do Localities Benefit from Natural Resource Extraction?

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With the advances in oil and gas drilling and recovery techniques that have occurred in the last decade, the State of Texas recently experienced another oil and gas boom. While annual crude oil production had been in long term decline in Texas for decades prior to 2010, it nearly tripled between 2009 and 2015, increasing from just below 400 million barrels in 2009 to 1.155 million barrels in 2015. This recent explosion in oil and gas production that occurred in Texas is, of course, attributable to the application of horizontal drilling and hydraulic fracturing technologies that have enabled extraction of oil and gas from shale deposits.

Economic research in the 1990s consistently found evidence that resource dependent economies exhibit slower long-term growth than more diversified economies. This phenomenon came to be called the Natural Resource Curse. While various reasons have been proposed for this resource curse, most researchers conclude that natural resource driven economic booms draw resources from non-booming export activities, lead to higher prices of non-tradables, and contribute to greater regional specialization. Most of the research in this area has focused on cross-country comparisons, but similar results have been found at both the state and county levels in the United States.

Using statistical modeling methods, we investigate the localized economic effects of this recent oil and gas boom among non-Metropolitan Statistical Area (MSA) counties in Texas. Our analysis extends the previous research on the question of the economics of resource endowments in several ways. Unlike most of the previous research that considers total regional employment, we investigate employment changes in terms of regional industrial composition and the likely inter-industry spillovers that a resource boom might engender. This is important since one explanation for the resource curse is regional specialization and the re-allocation of labor toward the booming industry.

Unlike earlier research on the effects of resource booms at small geographical scale, which has focused on natural gas production, this paper also examines possible effects from the rapid increase in petroleum production that occurred more or less concurrently in many counties in Texas. We further estimate effects on both median and per capita county income for comparative and interpretive purposes. Lastly, our paper undertakes an analysis of the effects of the boom on property tax bases and public school finance at the school district level.

Using only the State of Texas as the region for analysis, we are able to exploit the controlled comparison presented by the uneven distribution of oil and gas resources at the county level to identify the localized impacts of oil and gas production on our variables of interest, i.e., employment, personal income, and public school finance. This provides an important control in the case of public finance that is not present in cross-state analyses. By using a single state for analysis, we have a consistent means by which to consider changes in property tax bases, rates, and public school finance. We consider the question of changes in levels of per-student public education expenditures

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as a direct measure of investment in human capital and an indirect measure of changes in levels of provision of local public goods.

We find that, at best, direct and indirect employment effects are modest while increases in per capita county personal income can be important. However, given that we also find lesser effects on county median income, we find it likely that gains in personal income have been rather more concentrated at higher income levels. As expected, we find that the value of county property tax bases increases with increases in production levels. Although we find no evidence that school finances were affected by oil and gas revenues over the course of the analysis, school districts appear to benefit from the higher levels of oil and gas activity in the post-2005 period (shale boom) as school tax rates are lower and per pupil expenditures higher in counties with higher levels of oil and gas production.

This paper is the first, to our knowledge, to investigate the economic effects of both oil and gas extraction in relatively small geographies (counties and school districts) and to consider the effects of natural resource extraction on public finances. It is our view that increased resource mobility within small geographies, as opposed to state or national level economies, should accelerate the collateral economic impacts of a sharp expansion in natural resource extraction and facilitate identification of the ingredients that lend themselves to a resource curse over the longer term, if they occur, within a relatively shorter time frame. We do not find the short term response of county economies to the oil and gas boom to be predictive of a resource curse over the longer term.