



## The fiscal impacts of increased U.S. oil and gas development on local governments



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### ABSTRACT

Increased US oil and gas production has created opportunities and challenges for local governments. Through interviews with roughly 250 local officials, we evaluate the fiscal effects of this development in 21 regions across every major US oil and gas producing state during “boom” and “bust” periods. Growing oil and gas production has increased local government revenues through a variety of mechanisms, including property taxes, sales taxes, severance taxes, and more. Industry activity has also increased costs and demand for local services led by road damage, water and wastewater infrastructure, and a range of staff costs including emergency services and law enforcement. Despite volatility in revenues and service demands, our interview results show that 74% of local governments have experienced net fiscal benefits, 14% reported roughly neutral effects, and 12% reported net fiscal costs. Local governments in highly rural regions experiencing large-scale growth have faced the greatest challenges. To further improve future outcomes, local officials can plan for impacts, state policymakers can re-examine revenue policies, and operators can pursue collaboration with local governments.

### 1. Introduction

Increased oil and gas development in the United States, largely associated with shale resources, has had major effects on global energy markets, geopolitics, and other matters of national and international significance. On a community scale, it has created opportunities and challenges for local governments where this development takes place. Although most public attention and scholarly work has focused on the environmental and economic impacts of shale development, policymakers and public managers must also consider the fiscal implications of increased oil and gas extraction.

While a substantial portion of growth in domestic oil and gas production has occurred in regions with decades of industry experience (e.g., parts of Texas and Oklahoma), shale development has brought new opportunities and concerns to regions with far less recent experience (e.g., parts of Pennsylvania and Ohio). In some of these regions, the oil and gas industry has increasingly found itself in close proximity to population centers (e.g., parts of Colorado and Texas). In others, development takes place in some of the most rural parts of the United States (e.g., parts of North Dakota and Wyoming). Regardless of where oil and gas development takes place, each of these regions have in recent years experienced a dramatic increase, then a substantial downturn in drilling activity.

These rapidly-changing dynamics highlight the need for better information on the how the local effects of oil and gas development vary between regions, and how different policy approaches shape local experiences. Of particular interest is how fiscal policies, which also vary widely between states, shape local experiences. The industry typically receives special treatment in state tax codes, and the revenues it generates can have major fiscal effects at state and local levels. In this research, we focus on the local fiscal impacts of oil and gas development in the United States in recent years.

Because of the resource rents generated by oil and gas development, tax policies that capture those rents can generate windfalls for governments with relatively little impact on private investment decisions. These revenues can in turn allow governments to enhance public services, reduce tax rates, save for the future, or some combination. At the same time, industry activity and associated population growth can increase demand for a variety of local government services. Unlike many other industries, the volatile nature of oil and gas prices has the potential to create wide swings in these effects, often referred to as “boom and bust” cycles (Jacquet and Kay, 2014).

The fiscal impacts of these dynamics can affect the wellbeing of residents in communities by affecting services such as education, infrastructure, and public safety. The value of these publicly-provided goods can manifest itself through increased residential property values

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in jurisdictions with higher spending on public services (e.g., Brasington, 2002; Mathur, 2008; Nguyen-Hoang and Yinger, 2011; Oates, 1969).

Changes to the quality of these services also affects the ability of the oil and gas industry to develop resources. If local communities believe that oil and gas development will positively (or negatively) affect public services, they may be more inclined to support (or oppose) industry activity, thereby increasing (or limiting) opportunities for energy development.

As noted above, some states (e.g., Texas or Wyoming) have a long history of energy production and have for decades considered how to collect and distribute government revenue associated with oil and gas activity. Others (e.g., North Dakota or Pennsylvania) have had less recent experience with large scale oil and gas activity, leading to changes in revenue policies (Rabe and Hampton, 2015).

Most states collect production taxes based on the value or volume of oil and gas extraction, with the bulk of these revenues flowing to state general funds (Newell and Raimi, 2017). As a result, most local governments rely heavily on internal revenue sources to manage costs associated with oil and gas activity.

In this paper, we attempt to answer two questions regarding the fiscal impacts of oil and gas development on local governments: (i) what have been the major revenue sources, major service demands, and net fiscal impacts for counties and municipalities affected by new or increased oil and gas activity; and (ii) have existing state and local policies provided sufficient revenue to manage increased demand for services associated with industry growth?

The goal of this work is to inform policymaking at the state and local levels on topics including natural resource revenue management, infrastructure planning, and strategic planning for oil and gas producing regions in the context of volatile industry activity.

## 2. Background and previous research

The fiscal implications for local governments of previous boom and bust cycles has been explored in literature following an energy “boom” in the late 1970s and early 1980s (e.g., Gulley, 1982; Leistritz et al., 1981; Merrifield, 1984; Toman et al., 1977). This work describes major strains on local services, particularly for rural western communities experiencing rapid growth in oil, gas, or coal development. In more recent years, infrastructure has been an important topic for researchers and governments in western states (Macke and Gardner, 2012; Porter, 2013; Upper Great Plains Transportation Institute, 2012), who find that shale development has had a substantial impact on state and local road networks.

Researchers in Pennsylvania's Marcellus shale region, where natural gas production has surged since roughly 2008, have explored a variety of local issues including economic impacts (Costanzo and Kelsey, 2012; Hardy and Kelsey, 2015; Kelsey and Hardy, 2015), generally finding positive economic impacts in communities where the most intensive drilling activity occurs. Other researchers have identified potential governance challenges of managing rapid industry growth, and noted concerns over negative spillover effects of oil and gas development on industries such as tourism (Christopherson and Rightor, 2012). A related concern is the potential for boom and bust cycles to hinder long-term economic performance, reduce quality of life for residents, and strain infrastructure in parts of Pennsylvania (Jacquet, 2009; Schafft et al., 2014).

While many researchers have examined these local governance issues with a focus on Pennsylvania or other specific regions, little has been done to synthesize and compare experience across state lines. Although some work has surveyed and catalogued state-level regulatory policies (Brown, 2013; Interstate Oil and Gas Compact Commission, 2013; Lave and Lutz, 2014; Richardson et al., 2013), we are unaware of work that seeks to systematically understand the impacts to local governments across both space and time (one possible exception is Bartik

et al., 2016, which we discuss below).

Instead, a broad literature has developed from a variety of sources assessing the near-term economic and employment impacts of increased oil and gas development in specific regions. Some of this work includes associated estimates of state and local government revenues. Along with the Pennsylvania-focused work mentioned above, researchers have examined the economic effects of development in regions such as North Dakota (Bangsund and Hodur, 2013), Texas, (Oyakawa et al., 2012; Perryman Group, 2011; Tunstall and Oyakawa, 2013; Tunstall et al., 2013), and elsewhere (e.g., Lewandowski and Wobbekind, 2013; Univ. of Arkansas Center for Business and Economic Research, 2012) typically finding large economic benefits of increased oil and gas activity. Much of this work, however, relies on estimates using input-output modeling techniques, which may overstate the contribution of the oil and gas industry by using large economic “multipliers” (Krupnick and Echarte, 2017) and by failing to account for potential crowding out effects in other industries. Other researchers have developed national or multi-region estimates based on more sophisticated modeling techniques, finding more modest economic gains from shale development (Feyrer et al., 2017; Hausman and Kellogg, 2015; Munasib and Rickman, 2015; Weber, 2012).

A related strain of work has addressed, and found mixed results on, the spillover effects of oil and gas development to other economic sectors (Allcott and Keniston, 2014; Miljkovic and Ripplinger, 2016), along with the longer term economic implications of oil and gas development for a variety of U.S. regions (e.g., Haggerty et al., 2014; Jacobsen and Parker, 2014; James, 2016; Ouedraogo, 2016; Weber, 2014). This body of work generally seeks to identify whether regions of the United States with large scale oil and gas activity have been prone to the “resource curse,” the notion that economic development, political institutions, and community wellbeing may be worse off for regions with large natural resource endowments. This subject is explored deeply in a variety of international contexts (e.g., Alexeev and Conrad, 2009; Humphreys et al., 2007; Sachs and Warner, 2001). To date, the evidence of whether U.S. communities have been, or will be, subject to such a “resource curse” is mixed (Krupnick and Echarte, 2017).

A growing literature assesses the effects of oil and gas development on residential property values, finding that increased development may heighten the perception of environmental risk, thereby reducing the value of specific properties (Gopalakrishnan and Klaiber, 2014; Muehlenbachs et al., 2016). Other research, however, finds small effects or no effect (Bennett and Loomis, 2015; Delgado et al., 2016). Other work looks broadly across communities, finding increased property values due in part to increased revenues driving by oil and gas development, which can enhance public services such as education (Boslett et al., 2016; Weber et al., 2014).

One particularly rich study (Bartik et al., 2016) estimates the welfare effects of shale development in nine regions. The authors find improvements in local economic conditions along with negative impacts on quality of life issues including crime rates and noise. For most regions, the net welfare effects are positive and fairly large. The authors also analyze local government fiscal data from the U.S. Census Bureau, finding increased local government revenues and expenditures, though they do not attempt to account for demand for public services that may go unmet (we discuss potential issues with U.S. Census data below).

Other researchers have focused specifically on oil and gas tax policies, finding wide variation in both the mechanisms used and the levels of revenue collected by states (Headwaters Economics, 2014; Kaiser, 2012; Newell and Raimi, 2017; Paydar et al., 2016; Weber et al., 2016). While some states (e.g., Alaska, North Dakota, Wyoming) tax extraction at relatively high rates, others (e.g., Ohio, Pennsylvania, Oklahoma) apply far lower effective tax rates. The historical, political, and economic reasons for these different approaches to taxation are unclear, though Rabe and Hampton (2015) describe movement in some states towards utilizing resource taxes to mitigate environmental externalities and to save for future generations.

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