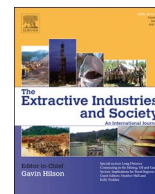




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Original article

Does oil and gas development increase crime within UK local authorities?☆

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ABSTRACT

There is a renewed interest in expanding domestic oil and gas development in the United Kingdom (UK). However, the potential social consequences of this expansion are still unknown. Thus, the current study assesses whether the number of spudded oil and gas wells are correlated with violent and property crime rates within 69 local authorities between 2004 and 2015 ($n = 828$). Fixed effects regression analyses indicate that wells are positively correlated with violent crime rates. That is, each additional well is associated with a 1.5% increase in violent crime. When the analysis is limited to those local authorities that have constructed the most wells, the correlation between wells and crime increases as the boomtown literature might suggest. In particular, each additional well is associated with a 4.9% increase in violent crime and a 4.9% increase in property crime. We conclude by pointing out that this study stands as the first to empirically examine the relationship between oil and gas development and crime within UK local authorities over time and suggest that results have important implications for crime, social disorganisation and environmental justice.

1. Introduction

Global energy demands and a call to increase unconventional forms of natural gas extraction have led to a renewed interest in the relationship between oil and gas development and crime (Hultman et al., 2011). The present study responds to this interest by examining the relationship between oil and gas development and crime rates within UK local authorities between 2004 and 2015. The relationship between oil and gas development and crime in the UK is interesting for three reasons. First, UK policy-makers and industry are promoting the swift expansion of domestic natural gas development. For example, in January 2014 the UK's then Prime Minister David Cameron stressed gas extraction as one aspect of the government's new energy policy, noting, 'we're going all out for shale. It will mean more jobs and opportunities for people and economic security for our country' (Watt, 2014, 1). As oil and gas expansion is set to expand in the UK additional information about the potential consequences of oil and gas development on crime are warranted. Second, while a handful of studies have examined the relationship between natural gas extraction and crime in the US, there have been no studies of this potential relationship in the UK and it is unclear whether US findings can be extended to the UK (Hays et al., 2015). Therefore, additional studies of the relationship between oil and

gas development and crime are needed in the UK for extension and comparison. Third, the present study can provide additional theoretical insight into the potentially disruptive consequences of extractive forms of development by examining crime as an outcome. This focus can be linked to contemporary environmental justice issues and debates (Freudenburg and Gramling, 1992).

Our analysis of oil and gas development and crime is divided into four sections. First, we draw upon the concept of boomtowns and social disorganization to explain why oil and gas development might be related to crime. We then provide a summary of the existing empirical studies that examine the relationship between oil and gas development and crime. Second, we describe the key variables used to examine the correlation between oil and gas development and crime. Third, we explain how we use these key variables to examine crime rates within local authorities in the UK. Finally, we draw some conclusions about the role of oil and gas development on crime rates and explore some potential implications of these findings for the political economy of crime and environmental justice studies.

2. Theoretical perspective & previous empirical studies

There is a common belief that oil and gas development can

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disorganise communities by causing the rapid congregation of people and money (O'Connor, 2015, 2017). The term 'boomtown' is historically used to describe natural resource development and its connection to crime. Nearly one hundred years ago historian Hagedorn (1921, 48) described Little Missouri (USA) as a 'boomtown' and 'villainous gateway to the bad lands [and full of] outcasts of society, reckless, greedy, and conscienceless; fugitives from justice with criminal records, and gunmen who lived by crooked gambling and thievery of every sort.' In the UK the term is also synonymous with the kind of social disorder that is perpetuated by rapid population growth (Brooks and Haworth, 1993; Calnan, 2011).

The notion of social disorganisation often associated with boomtowns can be traced back to Durkheim ([1893]1893). As communities change with the introduction of development, mechanical solidarity declines and leads to greater variation in community norms that facilitate higher rates of community problems such as suicide and crime (Durkheim [1893] 1984). Over time, Durkheim suggests that development can prevent social problems if institutions are correctly functioning and as mechanical solidarity gives way to organic solidarity in a move that strengthens regulative and integrative social forces (see also Shelley, 1981).

Despite the general modernization idea that development can lead to reductions in crime over time, most studies of community crime and oil and gas development tend to focus on the short term and negative aspects of development. Researchers such as Freudenburg (1979, 1984, 1992) have observed that oil and gas development can produce boomtown like conditions that sow the seeds for immediate increases in crime (Wilkinson et al., 1982). Researchers who examine oil and gas development on crime also suggest it is 'inherently disruptive' for communities. For instance, Luthra (2006) and Seydlitz et al. (1993) observe that social disorganisation associated with oil and gas development may be the mechanism that explains the relationship between extraction and crime. These observations about social disorganization acting as a mechanism in explaining crime are situated in Shaw and McKay's (1969) work in Chicago (USA). Shaw and McKay point out that rapidly changing populations will disrupt patterns of relationships within communities and create the kind of social milieu and community conflict that is ripe for crime and deviance (Shaw and McKay, 1969). They note that social institutions are less effective within zones of transition because people know a smaller proportion of community residents and therefore have fewer social bonds that prevent crime (Shaw and McKay, 1969; see also Freudenburg, 1979). Social isolation may increase in areas where oil and gas development occurs because people have less contact with those people they do know, weakening social ties among residents (Freudenburg, 1979). Together, fewer bonds and weaker ties may create the social conditions for crime. Because of the decrease in the density of acquaintances, communities that are in transition must increasingly rely on formal social controls such as law enforcement to prevent unwanted behaviour (Clinard and Meier, 1975; Ruddell, 2011). This type of social control may lead to additional weakening of community bonds and can result in even more crime. These ideas about social disorganisation provide the theoretical grounding for most studies of oil and gas development and crime.

A handful of empirical studies have examined whether oil and gas development is correlated with crime. These studies can be classified according to their results. The first set of studies find evidence of a correlation between oil and gas extraction and crime. For example, Seydlitz et al. (1993) examined the impact of offshore oil and gas development on community crime rates. The researchers examine the impacts of offshore oil extraction wells in communities surrounding the Gulf of Mexico by looking at the price of oil and the number of wells

drilled in Louisiana parishes between 1956 and 1981. They find that homicide rates were higher in those parishes with the most wells. This positive correlation between oil development and crime was more intense in those parishes where a greater percentage of residents were employed in the oil industry and therefore receiving higher oil and gas wages. Consistent with social disorganization theory, the researchers also find that homicide rates were highest during those periods of rapid oil and gas development (Seydlitz et al., 1993, 1999).

Ruddell and Ortiz (2014) recently examined property and violent crime in oil and gas producing counties in Montana and North Dakota. The researchers compared (1) property and violent crime rates in 26 oil producing counties to crime rates in a matched sample of 26 non-producing counties and (2) property and violent crime pre- and post- 'gas booms' in all counties. The researchers discovered no statistically significant differences in crime rates when comparing across communities by level of development. They did, however, discover a sharp increase in crime over time in oil producing counties. Specifically, both violent and property crime increased in oil producing counties between the years of 2006 and 2012. For violent crime, the increase was 19% and for property crime, the increase was 12%. In contrast, property crime decreased by 22% and violent crime decreased by 26% in non-producing counties pre- boom (2006–2008). Interestingly, the only demographic difference between counties was population change during the boom years (2008–2012). The population in non-producing counties increased by 0.13%, while the population of oil producing counties increased by 1.85%. The overall population, percentage of males and per capital income did not differ between counties.

Recently, Price et al. (2014) examined the relationship between the number of oil and gas wells and property and violent crime rates in 210 counties in Pennsylvania, Ohio and West Virginia (US). While the study found little evidence that increased oil and gas extraction related development led to population growth in a boomtown fashion, there was, nevertheless, a 17.7% increase in violent and 10.8% increase in property crime in high drilling counties between the years of 2005 and 2012.

A second set of empirical studies finds mixed evidence that oil and gas development leads to higher levels of crime. For instance, Covey and Menard (1983) conducted one of the first longitudinal studies of crime rates in Colorado (US) during the 1970s and compare the change in crime rates between counties with and without oil and gas development over time. The researchers found that between 1970 and 1979 crime increased more substantially in oil and gas development counties than those without development. Covey and Menard's results persist even after controlling for population changes. However, the results were not consistent for all types of crime as Covey and Menard found that oil and gas development was associated with a decrease in homicide rates.

Komarek (2015) also recently examined the potential impact of unconventional gas extraction (or fracking) in Pennsylvania (US) counties in the Utica and Marcellus shale formations between the years of 2004 and 2012 and discovered that the number of unconventional wells drilled is positively correlated with violent crime (i.e., murder, rape, robbery and assault). Importantly, Komarek (2015) discovered that high-development counties (i.e., those that had more than 75 wells) had violent crime increases that were 30% higher than low-fracking counties. Importantly, the number of fracking wells was related to violent crime in both high- and low-fracking counties between the years of 2004 and 2012. Despite the rather strong correlations between violent crime and fracking wells, Komarek (2015, 31) found that property crime was uncorrelated with the number of fracking wells. Finally, James and Smith (2017) examined the relationship between

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