The Association Between Fracking and Crime Rates in U.S. Counties

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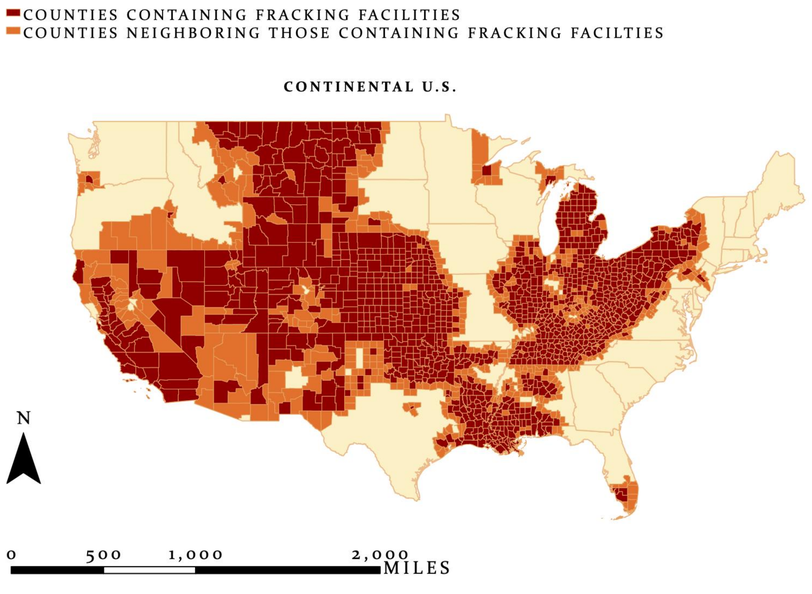
Introduction

With the expansion of hydraulic fracturing, the rural US has seen a rapid increase in natural gas extraction (Bartik et al. 2019, Kilian 2017). This expansion has been created more than five hundred thousand jobs and stimulated numerous rural economies (Maniloff and Mastromonaco 2017). And, while Maniloff and Mastromonaco also find a negative correlation between economic stimulus and crime, there have been numerous news reports claiming that fracking has increased crime rates (Healy 2013). Therefore we choose to test the scope and validity of these claims across the entire U.S.

Data

The property crime data is taken from the FBI's uniform crime reporting (UCR) program, which aggregates property crimes on the county level. The location of the fracking sites in the U.S. come from the Fractracker alliance, which collects data on 794,724 wells using hydraulic fracturing (see Fig. 1). Our economic data is aggregated from the Bureau of Economic Analysis as it pertains to unemployment, population totals, GDP, and income. We then use the average yearly consumer price index (CPI) from the Bureau of Labor Statistics to put the income value in real terms.

Figure 1.



Model

For our analysis, we use a difference-in-differences approach to estimate the effect of being a fracking county post boom of 2010:

$$PropCrime = \beta_0 + \delta_0 Treatment * Post + \delta_1 Treatment + \delta_2 Post + \beta_1 Unem + \beta_2 GDP + \beta_3 Pop + \beta_4 Inc + \theta_t$$

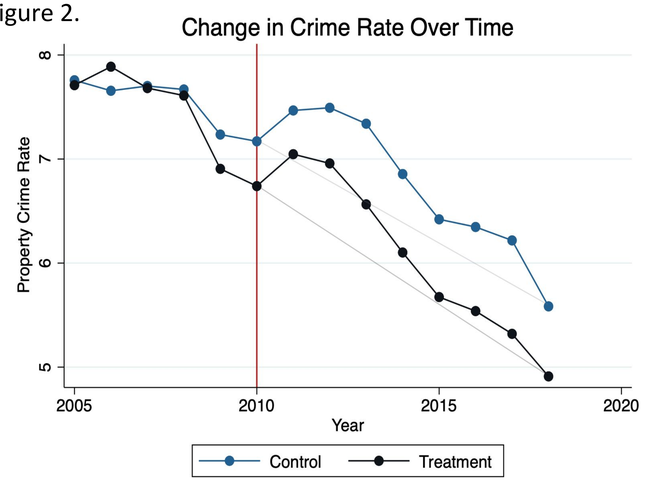
The key component of our dif-in-dif model is the coefficient on the interaction term *Treatment*Post* which isolates the effect on crime of being a fracking county after the fracking boom. Additionally we include the economic factors controlling for GDP, population, real income, unemployment, as well as the yearly fixed effects.

Results

The key variable, *Treatment*Post,* has a coefficient of -0.618. It indicates that, on average, being a fracking county post 2010 decreases crime rate per one thousand people by .618 as compared to all other groups (see Fig. 2). We also find that the effects of GDP, real Income, and unemployment confirm what has been previously found in literature

In contrast with the literature however, the effect of population on the crime rate is negative. These results indicate for every increase of one thousand people in population, the property crime rate decreases by .003.

Figure 2.



Graph showing the difference in crime rates for fracking counties (treatment) and bordering counties (control) between 2005 and 2018. The red line indicates the fracking boom where tight oil production increases from 0.8 million barrels per day to 2.5 million (Street, 2019).

Table 1. Regression Results

Crime Rate	Coef	St. Err	t-value	p-value	[95% Conf	Interval]	Sig
Post_Treatment	-0.618	0.202	-3.06	0.002	-1.014	-.022	***
Post (1 if post 2010)	-1.811	0.256	-7.08	0.000	-2.313	-1.310	
Treatment (1 if fracking county)	-0.042	0.174	-0.24	.809	-0.384	0.299	***
Unemployment	0.283	0.019	15.13	0.000	0.246	0.320	***
Population	-0.003	.001	-4.70	0.000	-0.004	-0.002	***
GDP	0.000	0.000	-2.87	0.004	0.000	0.000	***
Real Income	0.000	0.000	3.34	0.001	0.000	0.000	***
Constant	6.268	0.238	26.32	0.000	5.801	6.735	***

*** p<0.01, ** p<0.05, * p<0.1

Conclusion

Overall, our findings show that the claims made in Healy 2013 were potentially isolated and fracking actually decreases the property crime rate in aggregate. It is likely that this is a result of the economic impacts and job stimulus associated with the resource boom. Therefore, policy makers must consider the economic impacts when determining fracking regulation. It is worth noting that we do not include any environmental costs into our analysis, and these impacts must be a consideration as well

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Sources

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