

Employment Effect of the Clean Air Act

An Examination of the Clean Air Act and Its Impact on the Manufacturing Sector Within Counties in New York

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Model

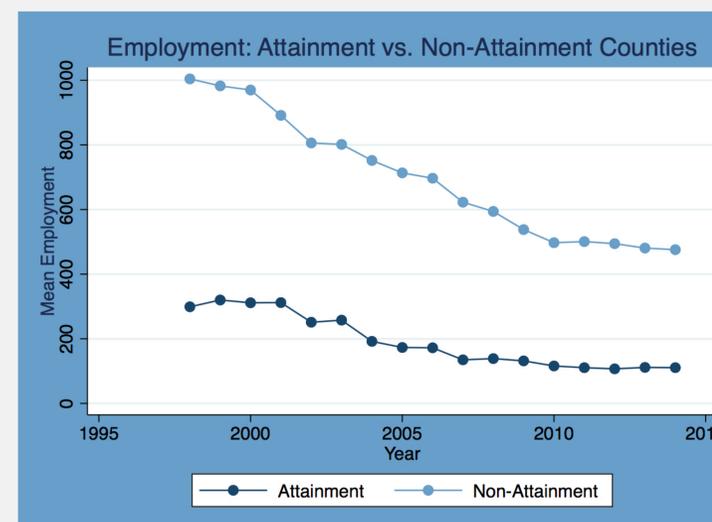
$$Emp_{c,i,t} = \beta_0 + \beta_1 nonatt_{c,t} + \beta_2 polluter_{i,t} + \beta_3 nonatt * polluter_{c,i,t} + \beta_4 pop_{c,t} + \beta_5 nest_{c,i,t} + c_c + v_t + i_i + u_{c,i,t}$$

Summary Statistics

Attainment/Polluter Status	Mean Employment (measured in number of people)	Observations
Attainment	200.854	9484
Non-Attainment	677.088	8679
Pollution Intensive	339.632	7269
Non-Pollution Intensive	487.659	10894

Results

Our results demonstrate a statistically significant decrease in relative employment for attainment counties and non-pollution intensive industries. by 54,004 employees and 46,894 employees respectively. However the coefficient for the interaction variable measuring employment level for pollution intensive industries in non-attainment counties shows a 177,338 increase in relative employment. This graph represents the overall change in employment for attainment and nonattainment counties. It demonstrates an overall decrease in employment over-time since 1998. Our results imply that the overall decrease in employment is more likely due to outsourcing jobs to other countries, rather environmental regulation as both attainment and nonattainment counties experience similar levels of employment decrease.



Introduction

The purpose of this research is to estimate the county-level effect of the CAA on employment in the manufacturing sector, in order to better inform policy decisions. We focus on the state of New York as the specific area of interest. Through data analysis we hope to find the true effect the CAA had on the manufacturing sectors from its most recent amendment in 1990. By analyzing this time period, we can see how the reinforcement of the act and stricter regulations from the 1990 amendment change the employment level in each county. By focusing on manufacturing, we do not aim to suggest that environmental regulation does not impact other sectors, but instead aim to draw on a rich pool of existing research based on the manufacturing industry. We will consider the variation in impact on employment in either "attainment" or "nonattainment" counties as they are defined in the Clean Air Act Amendments of 1977, and the impact of the regulations introduced in 1990. We aim to explore the question of whether or not environmental regulation kills jobs or if the economy is able to absorb the changes.

Existing literature on employment

Smith et. al (2013) provide insightful details in how the National Employment Rights Authority (NERA) prepared a study reviewing the accuracy of the EPA's method for estimating employment impacts related to the Clean Air Act regulations. Smith (2013) writes that NERA's model estimates that regulations regarding the Utility Mercury Air Toxics Standard would negatively impact worker income equating to approximately 200,000 lost jobs in 2015, and another 75,000 jobs lost annually. According to NERA's study, the EPA's Cross State Air Pollution rule would result in an annual loss of 34,000 jobs between 2013 to 2037. In addition, the EPA's industrial boiler maximum achievable technology would result in a decrease in incomes equivalent to 28,000 lost jobs from 2013 to 2037. Finally, the EPA's National Ambient Air Quality Standard would reduce worker incomes by the equivalent of over 600,000 jobs annually from 2013 to 2037 according to Smith (2013). The existing literature discussing CAA's impact on employment covers ground ranging from plant level effects to county-level effects and discusses these repercussions across various industries. While literature including Levinson (1992) examines the economic effects of environmental regulation at the state level, Jaffe et. al (1995) concludes that state-wide data may be too broad to reliably capture the effects. Greenstone (2002) finds that over the fifteen years following the initiation of the 1977 Clean Air Act Amendments, nonattainment counties suffered the loss of 590,000 jobs. Hafstead and Robertson (2019) find that the long run effects of policy on overall employment tend to be small, and that most of the job losses in some industries are made up for by more job openings in other industries.

Conceptual Framework

The marginal abatement cost curve informs this theory in that it is cheaper for a firm to reduce just a little bit of pollution, so firms that are outside of pollution intensive industries will be affected differently than those that are pollution intensive. The Porter Hypothesis states that strict environmental regulations can actually induce efficiency among firms by encouraging technological innovations that improve their competitiveness. In turn, the cost savings that can be achieved are sufficient enough to compensate for the compliance cost directly attributed to new regulations and innovation cost in what Porter (1995) describes as an "innovation offset" in order to assess the impact of the Clean Air Act on employment we use a difference-in-difference model analyzing the employment level within the manufacturing sector in each county on a yearly basis.

Data sources

We acquired FIPS, NAICS and employment (measured in number of people employed) data from the Census Bureau's County Business Patterns. Our sample includes each county in New York. Population data was gathered from the New York State Department of Health. We also use attainment and nonattainment data for each county, gathered from the EPA's Green Bank.

Conclusion

Our results indicate that heavy polluters in non-attainment counties experience a statistically significant increase in employment compared to non-polluters in attainment counties. These results fall in line with the Porter hypothesis in that the polluters in non-attainment counties are subject to the strictest regulations under the CAA but also experience higher employment levels. The economic outcome of the areas under the toughest environmental regulation improves, likely indicating that environmental regulation encourages innovation, not mass layoffs. This corresponds with the Porter Hypothesis, stating that environmental regulation leads to firms having to increase their innovation in order to cope with the strict regulations. Overall, we have found promising evidence that well-designed environmental regulations lead to higher employment where they are most enforced. With this in mind the further development and enforcement of environmental regulations shows promise in improving both the environment and economy, at least when it comes to the manufacturing industry.