

The Impact of Environmental Policy on Jobs in China

Yangsiyu Lu and Jacquelyn Pless *

University of Oxford
March 12th, 2019

How does environmental policy impact jobs? This question has been a long-standing debate in the environmental economics literature. Increased operating costs could lead to layoffs or firm closure, yet at the same time, regulated firms may increase investments in pollution abatement. Indeed, some show that more stringent environmental regulations reduce employment (Greenstone 2002), whereas others find that environmental policies can actually create jobs (Morgenstern, Pizer and Shih 2002; Yamazaki 2017).

Most of the literature so far focuses on firms in developed countries. However, understanding the implications in a developing country context is increasingly important as the roles of countries such as China and India expand in the global economy. With increasing pollution and related public health concerns in these countries, their governments are aiming to implement policies that simultaneously protect the environment and drive growth. Firms in developing countries also may respond to environmental policy incentive structures quite differently than those in developed countries, and there are often questions about whether environmental policies are enforced in practice if institutions are weak.

In this paper, we study the impact of environmental policy on jobs in China. We use firm-level data and employ difference-in-differences and triple-differences approaches to estimate the causal effect of the Two Control Zones (TCZ) policy on employment. The TCZ policy was implemented in 1998 in an effort to reduce SO₂ emissions—one of the most important sources of air pollution in China—imposing stricter regulations in 175 prefectures across China. Prefectures were assigned with TCZ status according to their annual ambient SO₂ concentration and precipitation pH values. The regulated regions account for nearly half of China’s total population and more than half of its Gross Domestic Product, making it a particularly important environmental policy to study in the context of its impacts on employment.

We obtain data on Chinese firms from China’s Industrial Enterprise Database (CIED), which includes between 24,000 and 412,000 firms per year in mining, manufacturing, and power sectors over the years 1996 through 2008. Using firm-level data allows us to overcome a key identification challenge. Since TCZ-status is not randomly assigned, firms in TCZ zones differ across various

*Corresponding author. University of Oxford, Eagle House, Walton Well Road, Oxford OX2 6ED, United Kingdom. Email: jacquelyn.pless@inet.ox.ac.uk.

observable characteristics relative to those in non-TCZ zones in years preceding policy treatment. Using firm-level data allows us to construct a panel of firms that appear at least once before and once after the policy is implemented so that we can include firm-level fixed effects, controlling for these differences. We include a rich set of other firm-level controls as well and we enhance this dataset with city-level data from the China City Statistical Yearbook for additional controls.

Preliminary results show that stricter environmental regulation leads to a positive and statistically significant impact on jobs in regulated regions. Employment increases by approximately 8% for firms located in TCZ prefectures compared to those in non-TCZ prefectures, suggesting that the policy stimulates employment growth. The effect differs across industries, such that the positive employment impact on firms in dirty industries is slightly lower than it is for firms in clean industries, but it is still economically and statistically positive for dirty firms. One potential concern is that the environmental policy was simply not properly enforced, however we are able to rule this out by obtaining additional pollution data at the city-level and showing that the policy was indeed effective in reducing SO₂ emissions.

Our results hold when conducting numerous robustness checks. Continued work is exploring heterogeneity across numerous dimensions such as firm age, industry composition, and average wages, which may have important implications for the distributional effects of the policy. We are also examining the policy's effects on other firm performance measures to better understand the impact of environmental policy on firm competitiveness in a developing country setting.

The primary contribution of this paper is that it is among the first to provide evidence on the “jobs versus environment” debate in a developing country context. Studying the impact of environmental policy on employment in China is particularly informative given the country's tremendous growth over the past decade and its role in the global economy, combined with increased concerns around air quality. The debate regarding a potential trade-off between economic growth and environmental protection is a particularly contentious political issue in China with important implications for development.

References

- Greenstone, M.**, “The Impacts of Environmental Regulation on Industrial Activity: Evidence from the 1970 and 1977 Clean Air Act Amendments and the Census of Manufactures,” *Journal of Political Economy*, 2002, 110 (6), 1175–1219.
- Morgenstern, R.D., W.A. Pizer, and J.S. Shih**, “Jobs versus the environment: An industry-level perspective,” *Journal of Environmental Economics and Management*, 2002, 43 (3), 412–436.
- Yamazaki, A.**, “Jobs and climate policy: Evidence from British Columbia's revenue-neutral carbon tax,” *Journal of Environmental Economics and Management*, 2017, 83, 197–216.