

RESEARCH BRIEF

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The Costs of Blue Sky: The Distributional Effects of Environmental Regulation on Labor Demand in China

Based on EFD Discussion Paper by Bing Zhang and Mengdi Liu.

In response to tougher environmental rules, factories need to cut down on pollution and modify their optimal production decisions, which may have an impact on their labor demand. We look into how China's policy for controlling air pollution in major cities affects jobs.

Key Messages

- China's policy on air pollution control in major cities decreased manufacturing jobs by about 3%.
- Regulation-driven technological progress has made workers more productive but has also led to fewer jobs.
- Women, low-skilled workers, and employees in domestic manufacturing firms are more affected by environmental regulations in China.

Background and Methodology

In China's system, where government promotions depend on meeting targets, top-down, goal-oriented environmental rules are very effective. This study focuses on China's Key Cities for Air Pollution Control (KCAPC) policy, a significant policy for controlling air pollution in key Chinese cities. In 2001, 66 cities were designated as the second batch of KCAPC. Our main goal is to evaluate how this policy affects jobs. Our

analysis, using a firm-level panel dataset spanning ten years (1998-2007), employs the difference-in-differences (DID) method to compare cities affected by KCAPC with those not. As these cities were chosen based on their economic status and pollution levels, we used the propensity score matching (PSM) method to create a balanced comparison group. This matching process, considering pre-existing characteristics of the cities, resulted in evenly distributed groups of 62 cities each for our analysis.

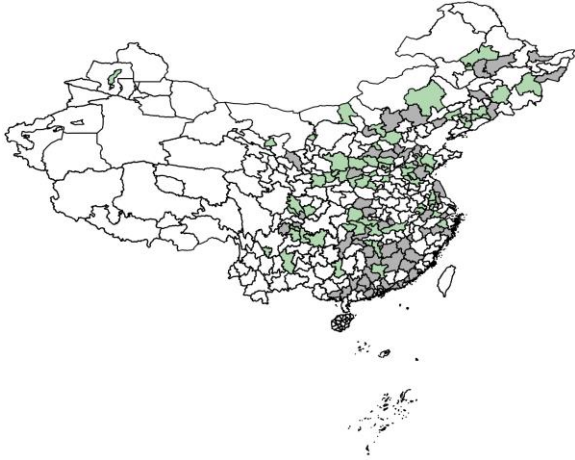


Figure 1. The distributions of treatment and matched control groups

Results

Main Results. Our study initially looked at the KCAPC policy's success in reducing SO₂ emissions at the firm level, finding a 26% decrease. We then examined the policy's influence on labor demand in the manufacturing sector, noting a 3% decrease at the firm level. The study indicates that each 1% reduction in SO₂ emissions corresponds to a 0.13% decrease in labor demand. Additionally, using city-level industrial SO₂ emissions and employment data, we found similar trends, confirming the policy's impact on both pollution and employment at various levels.

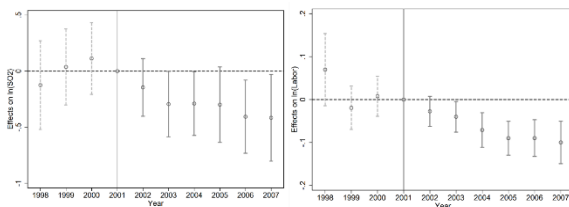


Figure 2. Treatment-year interaction coefficients for firm-level SO₂ emissions and labor demand

Mechanism. To understand how environmental regulations reduce firms' labor demand, we looked at their emission reduction methods. Firms under the KCAPC policy mainly switched to more efficient, less polluting boilers, rather than focusing on "end-of-pipe" pollution control or production reduction. These technological updates typically lead to a decrease in the need for unskilled labor. Moreover, we observed an increase in labor productivity in these firms after the policy's implementation, indicating that technological improvements played a role in the reduction of employment.

Heterogeneity. In addition to the overall impact of environmental regulations on job demand, policymakers are interested in identifying the most affected groups. Our research indicates that in China, environmental regulations are more likely to lead to job losses among low-skilled workers, women, and employees in domestic firms. This may be because men often occupy specialized roles, while women are more commonly in unskilled positions.

Policy Implications

As China intensifies its environmental regulations, it's vital to consider their potential impact on employment, particularly for low-skilled workers, women, and local company employees. This assessment is crucial for understanding the economic consequences of such policies and fostering sustainable growth. Moreover,

with rising labor costs in China, the general trend is for industrial manufacturing to shift to South and Southeast Asian countries like India, Pakistan, Bangladesh, Thailand, and Vietnam. Identifying and supporting enterprises and individuals most affected by environmental regulations is key to the progress of these developing nations.

The Environment for Development initiative is a capacity-building program in environmental economics focused on international research collaboration, policy advice, and academic training. It consists of centres in Central America, Chile, China, Colombia, Ethiopia, Ghana, India, Kenya, Nigeria, South Africa, Sweden (University of Gothenburg), Tanzania, Vietnam, Uganda, and the US (Resources for the Future). Financial support is provided by the Swedish International Development Cooperation Agency (Sida).

My main suggestion is to aim for simpler language. This is quite academic and has a lot of jargon. With a simpler vocabulary, you could be relevant for a much larger audience. This is interesting stuff!