Do Improvements in Environmental Performance have an Adverse Impact on Employment?

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Do Improvements in Environmental Performance have an Adverse Impact on Employment?

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Research Motivation

- Continuous decline of toxic releases in the U.S.
- While the output level remains constant
- Decline of employment

Research question:
- Do voluntary improvements in environmental performance lead to job loss?

Literature Review

- Previous research focused on environmental regulation and the empirical results have been mixed.
  - Found reductions in employment (Walker 2011)
  - Found insignificant changes (Morgenstern et al. 2002; Cole and Elliot 2007)
- Little research on the impact of voluntary reduction of toxic releases on employment
  - Information disclosure policies allow the firms to utilize more flexible abatement methods
  - Voluntary reduction in pollution will only be undertaken if they are beneficial to the firm
  - Thus, their impact on employment might be different from command and control regulations.

Research Objectives

- To analyze how voluntary pollution reduction affects employment
- To examine how the effect of pollution control on employment differs by the type of abatement method used
  - Reductions in releases at the end of the process
  - Waste management (e.g., recycling, treatment)
- Pollution prevention

Framework

- Consider a profit-maximizing facility that makes decisions on the quantity of toxic releases, labor, and output simultaneously
- If the facility emits more toxic releases than a threshold, the facility must report its emissions to the EPA, which will then be publically disclosed
- Toxic releases are not directly regulated by mandatory regulations
- However, external pressures, desire to increase efficiency and reduce other regulatory pressures could lead the facility to voluntarily reduce its emissions

Methods

- Use Three Stage Least Squares model to estimate pollution reduction and employment simultaneously.
- Use five proxy variables for pollution control to capture various methods of abatement:
  - Toxic emissions
  - Emissions per unit of sales
  - Regulated toxic emissions
  - Regulated emissions per unit of sales
  - Waste management
- Use the following explanatory variables to control for external pressures that might lead a facility to change its pollution and employment.
  - Regulatory pressures (i.e., county nonattainment status, penalties from violating environmental regulation)
  - Community pressures (i.e., producing goods to consumers directly, League of conservation voters)
  - Pressures from other facilities (i.e., pollution reduction from sibling facilities, parent company headquarters location)

Hypotheses

- Facilities were more likely to reduce toxic releases if they were larger, faced more stringent regulatory pressures, and were located near headquarters and areas with higher income
- Reduction in toxic releases will reduce employment because many facilities control pollution at the end of the process, which tends to be more costly
- The effect of reducing toxic releases on employment will be less negative if facilities use pollution prevention methods

Conclusion

- Reductions in toxic releases reduce facilities' employment
- However, the method of pollution reductions plays an important role in determining how facilities' employment changes.
  - Pollution prevention results in smaller reduction in jobs than controlling pollution at the end of the PIPE.
- Reductions in regulated emissions decreases jobs, which is likely due to the command and control regulations requiring costly pollution control methods.

Citations:

Data

- Total Toxic Emissions and Employment

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>1st Emission Per Unit of Sales (Log)</th>
<th>1st Employment (Log)</th>
<th>2nd Emission Per Unit of Sales (Log)</th>
<th>2nd Employment (Log)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxic Emissions (Log)</td>
<td>-1.940***</td>
<td>0.077***</td>
<td>-0.072***</td>
<td>0.475***</td>
</tr>
<tr>
<td>TIE Report</td>
<td>0.296***</td>
<td>0.062***</td>
<td>0.191***</td>
<td>0.056***</td>
</tr>
<tr>
<td>Sales, (Log)</td>
<td>0.631***</td>
<td>0.272***</td>
<td>-0.036***</td>
<td>0.007***</td>
</tr>
<tr>
<td>Idle/Plant Pollution</td>
<td>-0.686***</td>
<td>0.146***</td>
<td>-0.047***</td>
<td>0.099***</td>
</tr>
<tr>
<td>County Nonattainment Status</td>
<td>-0.599***</td>
<td>-0.019***</td>
<td>0.075***</td>
<td>0.038***</td>
</tr>
<tr>
<td>Penalties</td>
<td>0.035***</td>
<td>0.002***</td>
<td>-0.098***</td>
<td>-0.138***</td>
</tr>
<tr>
<td>State LCV Scores</td>
<td>-0.002***</td>
<td>-0.005***</td>
<td>-0.116***</td>
<td>-0.088***</td>
</tr>
<tr>
<td>Firm Ownership</td>
<td>-0.248***</td>
<td>-0.017***</td>
<td>-0.267***</td>
<td>-0.049***</td>
</tr>
<tr>
<td>Final Goods</td>
<td>-1.183***</td>
<td>0.009***</td>
<td>-0.279***</td>
<td>-0.058***</td>
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<tr>
<td>Income Per Capita (Log)</td>
<td>-0.070***</td>
<td>0.100***</td>
<td>0.437***</td>
<td>0.101***</td>
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<tr>
<td>Unemployment Rate</td>
<td>0.079***</td>
<td>0.010***</td>
<td>0.118***</td>
<td>0.018***</td>
</tr>
<tr>
<td>Headquarters Location</td>
<td>-0.277***</td>
<td>-0.007***</td>
<td>-0.078***</td>
<td>-0.057***</td>
</tr>
<tr>
<td>Constant</td>
<td>1.118***</td>
<td>0.047***</td>
<td>1.258***</td>
<td>0.110***</td>
</tr>
</tbody>
</table>

Industry and year effects are included, but not reported.

Percent and Absolute Changes in Employment

<table>
<thead>
<tr>
<th>Variables</th>
<th>Percent and Absolute Changes in Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxic Emissions</td>
<td>-7.3% changes (-18 employees)</td>
</tr>
<tr>
<td>Emissions per Unit of Sales</td>
<td>-3.0% changes (-7 employees)</td>
</tr>
<tr>
<td>Waste Management</td>
<td>10.8% changes (26 employees)</td>
</tr>
<tr>
<td>CAA Regulated Emissions</td>
<td>-9.0% changes (-17 employees)</td>
</tr>
<tr>
<td>Regulated Emissions per Unit of Sales</td>
<td>-3.382% changes (-8 employees)</td>
</tr>
</tbody>
</table>