Are Firms with Female CEOs More Environmentally Friendly?

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Abstract

In this paper, we document a previously unknown benefit of women’s role in firm management: the enhancement of environmental protection. Through a panel data analysis, we find that firms with female CEOs produce less air and water pollution and greenhouse gas emissions, and receive fewer environmental penalties, compared to firms with male CEOs. Our difference-in-differences analysis shows that firms also reduce air and water toxic releases, greenhouse gas emissions, and receive fewer environmental penalties after experiencing a male-to-female CEO transition. Moreover, firms display higher awareness of environmental protection, reflected in their 10-K filings, when being led by female CEOs.

Introduction

• Firm leaders’ characteristics → Firms’ performance and behaviors
  • Overconfidence, Risk-taking behaviors:
    • Military CEOs (Bennedsen and Fredman, 2015)
    • Married CEOs (Roussan and Savor, 2014)
    • Pilot CEOs (Sander, Sutardi, and Zhang, 2017)
  • CEO’s social network (El-Khalil, Fogel, and Jandali, 2015)
  • CEO’s political connection (Fan, Wang, and Zhang, 2007)

• Gender matters
  • Female CEOs are less overconfident in corporate financial and M&A decisions (Huang and Kisgen, 2011)
  • Nonfinancial effect of CEOs’ gender, such as firm environmental protection, has received less attention.

• Research Question: Are firms with female CEOs more eco-friendly?

• Motivation (Why studying firms’ pollution)
  • A significant part of the world’s pollution is caused by firms.
  • 22% of the greenhouse gas, 50% of the total air toxicity (U.S. EPA, 2018)
  • Serious influence of firm pollution.
    • Harms public health (Ebmstein et al., 2015; Ilsen, Rossin-Slater, and Walker, 2017)
    • Lowers labor productivity (Zivin and Neidell, 2012)
    • Influences industrial production (Greenstone, 2002)

• Address endogeneity concerns.
  • Firm with a female CEO may be intrinsically financially different from a firm with a male CEO.
  • In comparison to financial indicators, nonfinancial outcome variables are less likely to be a major consideration in decisions regarding CEO appointments.
  • Identification strategy: difference-in-differences around executive transitions.

Data

• CEO Turnover Data
  • Execucomp
    • 1992 - 2017
    • 47,069 firm-year observations, 7,787 CEOs and 4,186 turnover events.

• Emission and Penalties Data
  • EPA Toxics Release Inventory (TRI)
    • 1997 - 2014
    • 2,525,090 plant-year level observations, 49,157 plants and 13,480 (parent) firms.
  • Manually matched the TRI firm names to the Execucomp firm names.
  • EPA Greenhouse Gas Reporting Program (GHGRP)
    • 2008 - 2017, green house gas emission
  • EPA Enforcement and Compliance History Online (ECHO)
    • 1996 - 2017, Penalties
  • Compustat & EDGAR

Findings

• Female CEOs → More Eco-friendly
  • Panel data analysis
    • Firms with female CEOs
      • Cause less air and water pollution
      • Produce less greenhouse gas emissions
      • Receive a fewer number of environmental penalties
    • Mention more emission-related words in their 10-K filings

• Difference-in-differences (DID) analysis
  • Firms reduce air and water pollution releases, reduce greenhouse gas emissions, receive fewer environmental penalties, and mention more emission-related words in their 10-K filings after experiencing male-to-female CEO transitions.

Empirical Results

Table 1. Total, Air and Water Toxic Releases

<table>
<thead>
<tr>
<th>Total</th>
<th>Air</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Toxic Releases</td>
<td>Total Total Air Emissions</td>
<td>Total Total Water Emissions</td>
</tr>
<tr>
<td>Female</td>
<td>60.39***</td>
<td>(0.10)</td>
</tr>
<tr>
<td>Post * Female</td>
<td>-0.0944**</td>
<td>(2.65)</td>
</tr>
<tr>
<td>Post</td>
<td>-0.0013</td>
<td>(0.01)</td>
</tr>
</tbody>
</table>

Table 2. Greenhouse Gas Emissions and Air Pollution

<table>
<thead>
<tr>
<th>Carbon Dioxide (CO2)</th>
<th>Non-CO2 Emission Plant</th>
<th>NOx Emission (NOx)</th>
<th>SOx Emission (SOx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>(0.20)</td>
<td>(0.10)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>Post * Female</td>
<td>-0.0066***</td>
<td>(2.23)</td>
<td>(1.12)</td>
</tr>
<tr>
<td>Post</td>
<td>0.0015</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
</tbody>
</table>

Table 3. Number of Penalties

<table>
<thead>
<tr>
<th># of Cases with End Penalty</th>
<th># of Cases with State/Local Penalty</th>
<th># of Cases with Post * Female</th>
<th># of Cases with Post * Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Post * Female</td>
<td>-0.0744***</td>
<td>(2.31)</td>
<td>(1.23)</td>
</tr>
<tr>
<td>Post</td>
<td>0.0245**</td>
<td>(0.11)</td>
<td>(0.07)</td>
</tr>
</tbody>
</table>

Table 4. Amount of Penalties

<table>
<thead>
<tr>
<th>Total Penalty Amount</th>
<th>State/Local Penalty Amount</th>
<th>Amount of Cost Recovery Withdrawn</th>
<th>Total Penalty Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>(0.00)</td>
<td>(0.00)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Post * Female</td>
<td>-0.0044**</td>
<td>(2.25)</td>
<td>(1.23)</td>
</tr>
<tr>
<td>Post</td>
<td>0.0021**</td>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
</tbody>
</table>

Table 5. Environmental Awareness

<table>
<thead>
<tr>
<th>Number of Emission-related Words</th>
<th>Frequency of Emission-related Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>(26.48***</td>
</tr>
<tr>
<td>Post * Female</td>
<td>-0.0064***</td>
</tr>
<tr>
<td>Post</td>
<td>0.0021**</td>
</tr>
</tbody>
</table>

Contact

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