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The Effectiveness of Information Disclosure: An Examination of the TRI

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RESULTS ARE PRELIMINARY

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Decision-Making Scenario

- Thinking about implementing (or expanding or reducing) an information disclosure requirement
- The program is costly
  - Time for regulated entities
  - Time to process data, administer program
  - Costly to make changes, if any are made, to improve performance
- Benefits are real, but less tangible

Information Disclosure as Policy Tool

- Overcome informational asymmetries
- Improve allocation of public resources
  - Public safety, enforcement, outreach
- Provide data for analysis
  - Internal and external
- Motivate changes in behavior
  - Pollution control instrument
  - Complement or substitute traditional regulation

Information Disclosure as a Pollution Control Instrument

- Causal Inference
  - Under what circumstances does information disclosure about public goods improve environmental performance?
- Causal Mechanism
  - How does information disclosure about public goods improve environmental performance?

Problems With Causal Inference

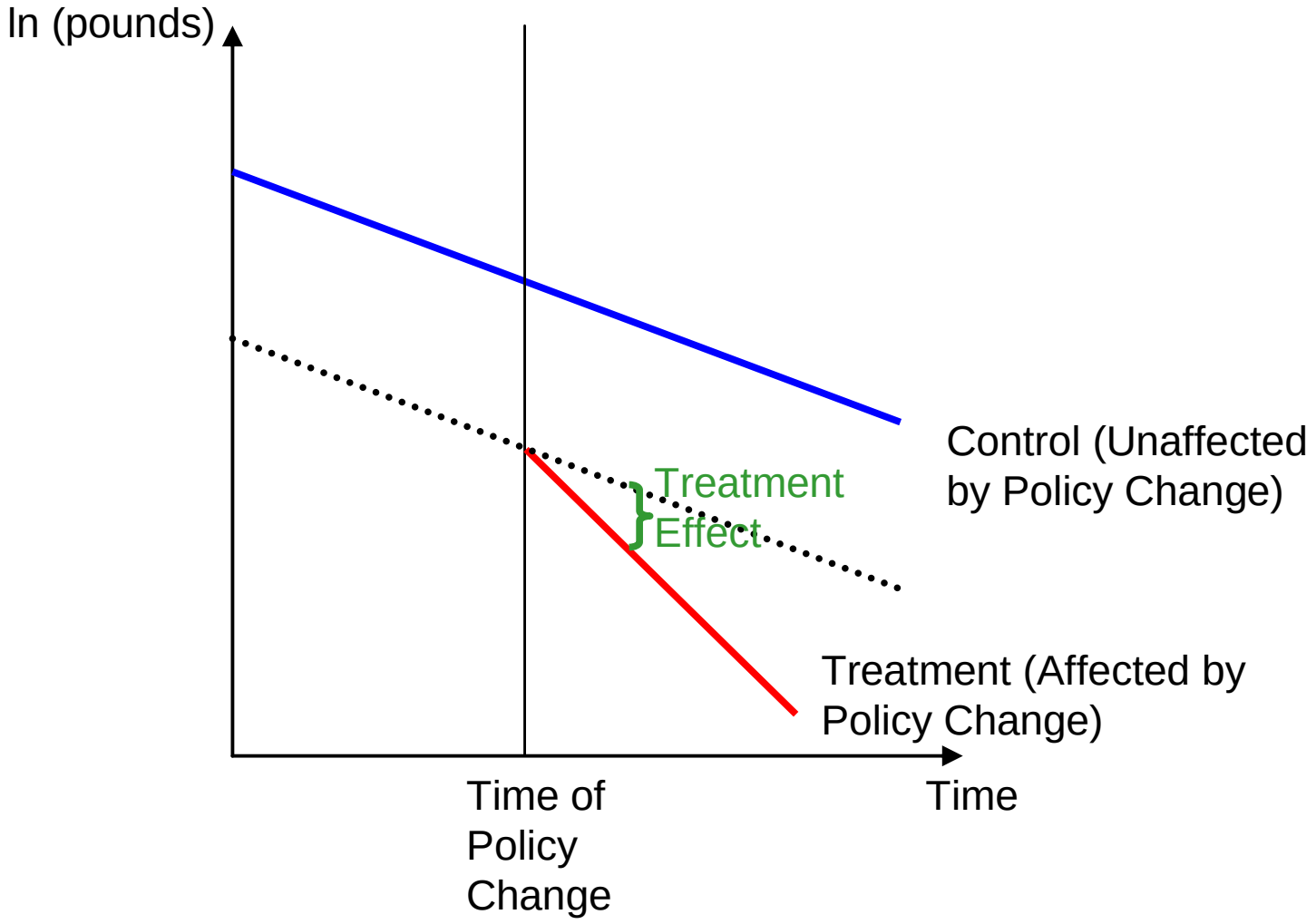
- Only observe data for entities that are required to report.
  - Only observe data for the “treatment” facilities
  - Can’t compare treatment to control facilities that do not report
- Only observe data during years where reporting is required
  - Can’t compare treatment facilities during a regulated year to treatment facilities during an unregulated year

Possible Causal Mechanisms

- Market Mechanism
- Political Mechanism
- Institutional Mechanism

Our Analysis of TRI

- Capitalizes on major changes in reporting requirements
- "Treatment" is defined as being newly subject to the TRI requirements (e.g. a facility required to report for the first time or a facility reporting for a chemical for the first time)
- The "control" group are facilities that have reported previously.
- Use differences-in-differences estimators of causal effect.


ln (pounds)
Control (Unaffected by Policy Change)
Treatment Effect
Treatment (Affected by Policy Change)
Time of Policy Change
Time

Identifying Assumptions

- The difference-in-difference estimator will identify the causal affect of the policy change if:
  - In the absence of the policy change the trends in releases for the treatment and control groups would have been parallel.
  - In other words, we are controlling for important differences in the trend.

Treatment Category 1—New Industries

- At inception the TRI only covered manufacturing facilities (facilities in SIC 20-39).
- The TRI has been expanded several times since 1988 to cover more facilities.
- In 1994, federal facilities were required to report to TRI.
- In 1997, coal mining facilities, metal mining facilities, electrical utilities, chemical wholesalers, petroleum terminals/bulk stations, and solvent recovery services were required to report to TRI.

Treatment Effect for New Industries

- Comparing reporting facilities in newly reporting industries to reporting facilities in original industries
- Because industry is a key determinant of both the level of releases and the trend in releases over time, differences-in-differences not likely to yield valid causal effect
- Less priority on this analysis

Treatment Category 2—New Chemicals

- Original list of nearly 300 reportable chemicals.
- In 1995, facilities were required to report releases to the TRI of nearly 300 additional chemicals bringing the total number of chemicals reported to approximately 600.
- “Treatment” is based on chemical and takes a value of 1 if newly reported chemical in 1995.

Treatment Effect for New Chemicals

- Comparing trends in releases of new chemicals to trends in releases of previously reported chemicals
- Why we might find a result
  - When you report for something for the first time, serves as focusing device.
  - More likely to make changes
  - Once initial changes are made (low hanging fruit), changes are less likely
- Why we might not find a result
  - Cannot do this analysis for first set of chemicals (1987)
  - If newly reported chemicals are used in same processes as previously reported chemicals, all of the release-lowering changes may have already been made

Finding for New Chemicals

- Do releases of newly reportable chemicals in 1995 differ from trends in chemicals previously reportable.
  - Within the same facility (control for production, facility-specific factors)
  - Control for industry (industry dummies and separate regressions by 2-digit SIC)
  - Control for common time shock (time dummies)
- Limited evidence of this
  - Usually not statistically significant
  - For a couple of industries you can see a small negative (improved performance) effect

Treatment Category 3—Lowered Thresholds

- Most chemicals facilities are only required to report releases to TRI if they manufacture or process more than 25,000 pounds or otherwise use more than 10,000 pounds of a listed chemical.
- In 2000, Mercury threshold lowered to 10 pounds.
- In 2001, Lead threshold lowered to 100 pounds.
- Treatment in this case is reporting for lead or mercury for the first time in 2001 or 2000, respectively.

Treatment Effect for Lowered Thresholds (1)

- Comparing trends in releases of newly reporting facilities to trends in releases of previously reporting facilities for lead and mercury only
- Why we might find a result
  - When you report for something for the first time, serves as focusing device.
  - More likely to make changes
  - Once initial changes are made (low hanging fruit), changes are less likely
- Why we might not find a result
  - Comparing across facilities
  - Facilities that reported for lead and mercury under higher thresholds may be quite different in ways that affect both the level of releases and the trend in releases

Treatment Effect for Lowered Thresholds (2)

- Also compare trends in lead/mercury to trends in other chemicals for facilities that previously reported for other chemicals, but are newly reporting for lead/mercury.
- Eliminates cross facility comparison problems.
- May not find anything if changes were already made when facility reported for earlier chemicals. Same problem as with new chemical analysis.

Findings for Lowered Thresholds

- In the cross-facility comparison
  - No statistically significant effect for mercury
  - Often statistically significant but POSITIVE effect for lead (opposite of our hypothesis)
  - True even when we eliminate outliers
- In the within-facility comparison
  - Often is statistically significant effect, but POSITIVE (opposite of our hypothesis)

Caveats

- These results are preliminary
- Lack of evidence of causal effect does not mean information disclosure is not worthwhile
  - Cannot identify these effects from initial reporting, only from changes
  - All the action may have been at the beginning
- Even if information disclosure doesn't affect performance, may still be worthwhile
  - Facilitates allocation of public and private resources
  - Provides data for analysis

Future Work

- Examine alternative outcome measures
  - On-site releases versus off-site releases
  - Weight releases by toxicity
  - Engage in more source reduction activities
- Connect data to firm and examine strategic responses