Quantifying Regulatory Efficacy

OECD Workshop on Socioeconomic Impact Assessment of Chemicals Management

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Agenda

• Why evaluate efficacy of regulation?
• How does evaluation fit in the regulatory process?
• Why is evaluation so challenging?
• Methods for better regulatory evaluation
• Improving incentives for robust evaluation
• Discussion
Why evaluate?

• Feedback is important
• Systems mindset
• Inform existing regulations
  – Delivering expected results?
  – Revise or rescind?
• Inform future regulations/policies
  – Improve ex ante analysis
  – Understand *causal* relationships
Scientific method

1. Observation
2. Hypothesis
3. Experiment
4. Results
5. Revise or Support
Regulatory process

• Regulatory impact assessment (ex ante)
  – Hypothesize causal links between action & outcome
  – Assess risks (models, assumptions)
  – Identify alternative actions to manage risks
  – Estimate benefits, costs & distributional effects

• Public engagement (ex ante)

• Implementation

• Ex post evaluation?
## Challenges

<table>
<thead>
<tr>
<th>Ex-ante analysis</th>
<th>Ex-post analysis</th>
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<tbody>
<tr>
<td>• Well-established principles &amp; procedures</td>
<td>• Procedures less well-established</td>
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<tr>
<td>• Challenging methodologically</td>
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<tr>
<td>– Assumptions and models</td>
<td>– Counterfactual?</td>
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<tr>
<td>– Hypothesize outcomes</td>
<td>– Opportunity costs?</td>
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<td>– Measuring actual reduction in risks</td>
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<td>• Incentives lacking</td>
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Responding to Methodological Challenges

• Plan for retrospective review at outset
• Design rules to allow natural experiments
• Lay out theory of change
• Determine proper scope
• Measure causal relationship
Plan for review at the outset

- Problem to be solved
- Criteria for measuring success
- Causal logic model
- Time frame
Design to enhance learning

- Randomized controlled experiment
- Variation facilitates natural experiments
  - Pilots or trials
  - Different compliance thresholds or timing
  - Differences across jurisdictions
Illustrative Causal Model

Policy Design
- Problem identification,
- Risk assessment
- Impact analysis

Policy Implementation
- Enforcement

Behavioral Change
- Compliance costs
- Emission reductions
- Substitution

Outputs
- Concentration changes
- Exposure changes
- Opportunity costs
- Co-benefits & costs

Environmental & Health Outcomes
- Risk reduction
- Benefits
- Unintended effects
Scope

• Specific regulation vs. program-wide
• Outputs vs. outcomes
• Quantified benefits & costs
• Other factors
  – Innovation
  – Flexibility
  – Distribution
Measure causal relationship

- Quasi-experimental approaches
  - Over time
  - Across jurisdictions
- Statistical tests
  - Is X informative about Y?
  - Does X precede Y?
  - Does ΔX explain ΔY?
  - What do non-parametric methods show?
  - Effect of X w/ other variables held constant
Responding to Incentive Challenges

• Condition new regulation on ex post learning
• Institutionalize independent review
• Change default rules
• Reallocate resources
Conclusions

• Evaluation & feedback important
  – Identify underperforming (or overly costly) rules
  – Improve future policy
    • Modify *ex ante* assumptions
    • Calibrate risk assessments
    • Improve causal predictions of health benefits & other regulatory effects

• Solutions must address methods & incentives
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