Transparency and Accountability Intiatives for India's Mineral Mining Sector

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Plan for the Presentation

1. Motivate our research in the context of a general set of challenges facing policymakers in developing effective regulatory capability

2. Describe the challenges we have faced throughout the project

3. Outline our planned intervention with India's Ministry of Mines' Star Rating Program

4. Discuss quasi-experimental research on the political economy of a transparency and accountability program in India

Outline

About the Research Group

Evidence for Policy Design (EPoD)

> At Harvard University, in Cambridge, MA; the Institute for Financial Management and Research (IFMR), in Delhi; and the Center for Economic and Policy Research (CERP) in Lahore; increasingly working in Indonesia, Nepal, and Saudi Arabia

> Approach is **Smart Policy Design**: long-term policy-research partnerships to support evidence-based decision making from policy design and rollout to evaluation

> On environmental & energy policy, working with the Gujarat Pollution Control Board since 2009 and the Ministry of Environment Forests & Climate Change, along with several other Indian states, since 2011 on a series of evaluations of pollution control policies

Motivation

The Regulator's Puzzle: The simplest economic model (firms minimize expected compliance costs, net of non-compliance penalties) does not explain reality very well.

Appears that firms tend to over-comply relative to expected costs in much the rich world, while regulatory compliance in many developing countries is often low

Research motivation: *What explains the divergence between the model and observed behavior?*

Policy motivation: *How we use these insights to design more effective policy?*

Motivation: Economic Framework for Regulation

Firms minimize compliance costs net of expected fines for noncompliance,

$$\min_e \ EC(e) = \underbrace{Pr(D|\bar{e} - e)}_{\text{Probability of detection}} \cdot \underbrace{F(\bar{e} - e)}_{\text{Fine}} + \underbrace{c(e)}_{\text{Compliance cost}} ,$$

where e is compliance effort; $\bar{e}$ is a regulatory standard for effort; D is detection by the regulator in the event of non-compliance; $F(\bar{e} - e)$ is the fine amount as a function of the extent of noncompliance ($\bar{e} - e$); and $c(e)$ is the cost of effort e (e.g., capital, labor, materials outlays).

Motivation: Economic Framework for Regulation

Environmental policymakers in India have typically focused on increasing probability of detection, or to a lesser extent, fines, to increase environmental compliance.

Mixed results: work in Gujarat shows that improving the quality of information available to regulators improves compliance and reduces pollution (Duflo et al., 2013), while increasing inspections improves compliance marginally but does not reduce pollution (Duflo et al, 2015).

Increasing regulatory contact tends to be expensive and corruptible. Moreover, we do not necessarily see higher fines and probabilities of detection in countries with over-compliance.

Looking beyond expected fines: TAI

Beyond expected fines, several factors may help explain the puzzle:

- Learning/culture of compliance
- Reputation, competitive incentives
- Anticipation/dynamic responses (compliance investments today anticipate increased stringency tomorrow)
- Attention/regulatory contact

TAI attractive: low-cost, scalable, (potentially) less corruptible. May be operating through any or all of these channels

> **Focus to understand not only how effective TAIs are, but also which of these channels (or others) are operating when they succeed**

Context: India's Mining Sector

Mining, oil, and gas comprise a modest share of India's economy ($\sim$2.5% of gdp, employs about 250k), but the sector is large by global comparison:

Globally, by production: 4th in iron, 3rd in pig iron, 5th in aluminum, 5th in bauxite, 6th in manganese, 6th in zinc; 3rd in coal, 22nd in oil, 22nd in natural gas (from USGS and EIA)

Unlike the coal mining sector in India, the mineral mining sector is relatively unconcentrated

The mining sector is a priority for growth and foreign investment for the current government

Context: The Environmental Clearance Process

Centerpiece of environmental regulation in India: all major investment projects in all sectors must seek prior approval from the Ministry of Environment, Forests & Climate Change.

Politically sensitive: since 2006 reforms, in many sectors process takes 3-5 years, and has been blamed for lost growth

Larger projects apply through a national process, smaller projects through state processes. Most larger projects required to conduct an EIA and hold and respond to a public hearing.

It is both a conventional regulatory process and, increasingly, a major transparency initiative ("e-governance"): As of 2014, all project application and clearance data became available online for pending and approved projects since 2006.

Outline

1. Motivation, Context, and Research Questions

2. Experiences and Challenges

3. Intervention Design: Ministry of Mines' Star Rating Program

4. Quasi-Experimental Research: Political Economy in Transpaency and Accountability Initatives

Partnership with the Gujarat Pollution Control Board (GPCB)

Strong partnership with GPCB since 2009, including two completed and one on-going RCT.

Aim was to work with GPCB to design, roll-out, and evaluate an online TAI intervention based on compliance with Environmental Clearance conditions.

Held a series of trainings on various aspects of evidence-based policy with the incoming cohort of junior officers at GPCB, along with mid-level officers.

Data Collection

Second objective was to explore new data sources on the mining sector (and others) in India. We have collected, cleaned, and linked several datasets:

1. All Environmental Clearance Applications since 2006 - planned project characteristics, dates of application, clearance and intermediate steps
2. All Environmental Clearance letters for the mining sector since 2006 - approved project characteristics and clearance conditions
3. Geolocation of all major mineral mines in India
4. Registry of Mining Leases, all major mineral mines since approximately 1920
5. Local environmental quality data from NASA satellite imagery
6. Others: Company characteristics, local political outcome

Outline

Ministry of Mines' Star Rating Program

- Constructs an absolute index from more than 50 indicators of environmental and social performance
- Companies self-report; on-site verification conducted for all mines by the Indian Bureau of Mines
- All mines are legally required to achieve a 4- or 5- star rating within 2 years (by March, 2019)
- Public portal with mine-level performance information is planned for early 2018

Two Interventions Planned:

1. **Peer Reports**
2. **Publication of Mine-Level Star Ratings**

Peer Reports: Intervention, Outcomes, and Measurement

Intervention: Provide mines with a peer report card following submission of their Star Rating self-report, but prior to regulator verification

Outcomes & Measurement:

1. **Star-Rating Performance.** Regulator verification provides an immediate measure of effectiveness without a baseline or endline. Rich mine characteristics data from Indian Bureau of Mines and Environmental Clearance process for covariates.

2. **Environmental Performance.** Satellite-derived air pollution (SO_2 and PM) and land use observations.

3. **Regulatory Compliance.** Over time, observe compliance outcomes at treatment mines.

Expected sample size: About 500 mines

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4. **Press Coverage and Government Responses.** Use FACTIVA keyword searches.

Expected sample size: About 2,000 mines

Outline

Transparency and the Value of Political Connections in the Environmental Clearance Process

Reporting and anecdotes suggest that political connections matter a lot in the environmental clearance process. **Question: what is the value of political connections in the environmental clearance process and how is it affected by TAI?**

Using detailed data from the environmental clearance process, measure the value of political connections in terms of line-skipping in the consideration process.

Use mineral price shocks to generate quasi-random variation in the length of the EC queue.

Does the opening of the EC process to public scrutiny affect the value of political connections?