FLS 6441 - Methods III: Explanation and Causation

Week 5 - Natural Experiments

Jonathan Phillips

April 2019

Classification of Research Designs

	Independence of Treatment Assignment?	**Researcher Controls Treatment Assignment?**
Controlled Experiments	✓	✓
Natural Experiments	✓	
Observational Studies		

Classification of Research Designs

		Independence of Treatment Assignment	**Researcher Controls Treatment Assignment?**
Controlled Experiments	Field Experiments	✓	✓
	Survey and Lab Experiments	✓	✓
Natural Experiments	Natural Experiments	✓	
	Instrumental Variables	✓	
	Discontinuities	✓	
Observational Studies	Difference-in-Differences		
	Controlling for Confounding		
	Matching		
	Comparative Cases and Process Tracing		

Section 1

Natural Experiments

Natural Experiments

- **Advantages:**
  - We don’t need to run our own experiment!

Natural Experiments

- **Advantages:**
  - We don’t need to run our own experiment!
  - Still have independence of potential outcomes from treatment

Natural Experiments

- **Advantages:**
  - We don’t need to run our own experiment!
  - Still have independence of potential outcomes from treatment
  - Treatment may be more ’realistic’ than in a controlled experiment

Natural Experiments

- **Advantages:**
  - We don’t need to run our own experiment!
  - Still have independence of potential outcomes from treatment
  - Treatment may be more ’realistic’ than in a controlled experiment
- **Disadvantages:**
  - We can never be sure randomization worked

Natural Experiments

- **Advantages:**
  - We don’t need to run our own experiment!
  - Still have independence of potential outcomes from treatment
  - Treatment may be more ’realistic’ than in a controlled experiment
- **Disadvantages:**
  - We can never be sure randomization worked
  - We don’t get to choose the treatments we want to evaluate

Natural Experiments

- **Advantages:**
  - We don’t need to run our own experiment!
  - Still have independence of potential outcomes from treatment
  - Treatment may be more ’realistic’ than in a controlled experiment
- **Disadvantages:**
  - We can never be sure randomization worked
  - We don’t get to choose the treatments we want to evaluate
  - We don’t get to choose the population and sample

Verifying Randomization

- Causal Process Observations

The Problem of not picking your own treatment

- -

Section 2

Randomized

Ferraz and Finan (2008)

- Does accountability also work for negative politician performance like corruption?

Ferraz and Finan (2008)

- Does accountability also work for negative politician performance like corruption?
- But corruption is hard to manipulate ethically

Ferraz and Finan (2008)

- Does accountability also work for negative politician performance like corruption?
- But corruption is hard to manipulate ethically
- What is the inferential problem of using observational data on corruption?

Ferraz and Finan (2008)

- Does accountability also work for negative politician performance like corruption?
- But corruption is hard to manipulate ethically
- What is the inferential problem of using observational data on corruption?
- We can also look at voters' *information* about corruption

Ferraz and Finan (2008)

- Does accountability also work for negative politician performance like corruption?
- But corruption is hard to manipulate ethically
- What is the inferential problem of using observational data on corruption?
- We can also look at voters' *information* about corruption
- What is the inferential problem of using information on corruption?

Ferraz and Finan (2008)

- **Population:** Brazilian municipalities with population less than 450,000
- **Sample:** 373 Municipalities with audits either side of 2004 elections and first-term mayors
- **Treatment:** CGU Audit before election
- **Control:** Audit after election
- **Treatment Assignment Mechanism:** Randomized (Caixa)
- **Outcome:** Vote Share for the Incumbent

Ferraz and Finan (2008)

- Methodology
  - $IncumbVoteShare_{ms} = \alpha + \beta AuditedEarly_{ms} + X_{ms} + FE_s + \epsilon_{ms}$

Ferraz and Finan (2008)

- Methodology
  - $IncumbVoteShare_{ms} = \alpha + \beta AuditedEarly_{ms} + X_{ms} + FE_s + \epsilon_{ms}$
  - NO EFFECT

Ferraz and Finan (2008)

- The importance of a theoretical model:
  1. The content of the information released varies
  2. People's expectations/priors vary
  3. For reports to have an effect, voters must receive it through the media
- It's the interaction of expectations and information content that matters

Ferraz and Finan (2008)

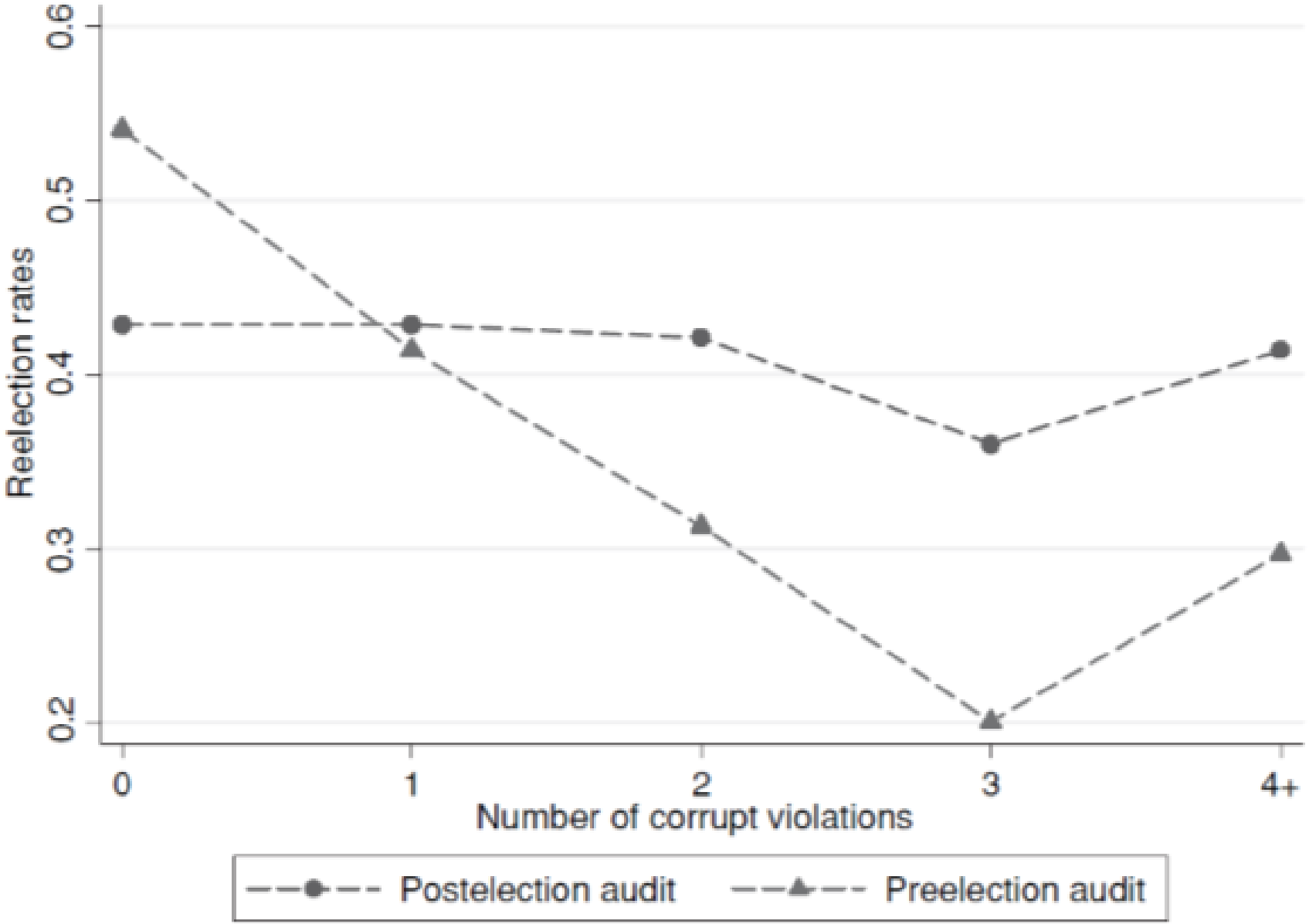
- Methodology
  - So expected results are *conditional on content of the audit report*

Ferraz and Finan (2008)

- Methodology
  - So expected results are *conditional on content of the audit report*
  - $IncumbVoteShare_{ms} = \alpha + \beta AuditedEarly_{ms} + \beta_2 Corruption_{ms} + \beta_3 AuditedEarly_{ms} * Corruption_{ms} + X_{ms} + FE_s + \epsilon_{ms}$

Ferraz and Finan (2008)

- Results
  - Strong corruption information (2 violations) reduces re-election by 7% points
  - Stronger corruption information (3 violations) reduces re-election by 14% points
  - Strong corruption information (2 violations) with local radio reduces re-election by 11% points


Reelection rates
0.2
0.3
0.4
0.5
0.6
0
1
2
3
4+
Number of corrupt violations
Postelection audit
Preelection audit

Ferraz and Finan (2008)

- Did randomization work?
- Excludability: Is treatment the same in pre/post-election audits?
- Are corruption measures exogenous?

Section 3

Non-Randomized

Non-Randomized Natural Experiments

- How can we achieve causal inference without randomization?

Non-Randomized Natural Experiments

- How can we achieve causal inference without randomization?
- Our assumption is always "The treatment Assignment Mechanism is independent of potential outcomes"

Non-Randomized Natural Experiments

- How can we achieve causal inference without randomization?
- Our assumption is always "The treatment Assignment Mechanism is independent of potential outcomes"
- Can we find real-world treatment assignments that ignored potential outcomes?

Posner (2004)

- How can we achieve causal inference without randomization?

Posner (2004)

- How can we achieve causal inference without randomization?
- Our assumption is always "The treatment Assignment Mechanism is independent of potential outcomes"

Posner (2004)

- How can we achieve causal inference without randomization?
- Our assumption is always "The treatment Assignment Mechanism is independent of potential outcomes"
- Can we find real-world treatment assignments that ignored potential outcomes?