

Lessons from Randomised Evaluations for Reducing Corruption

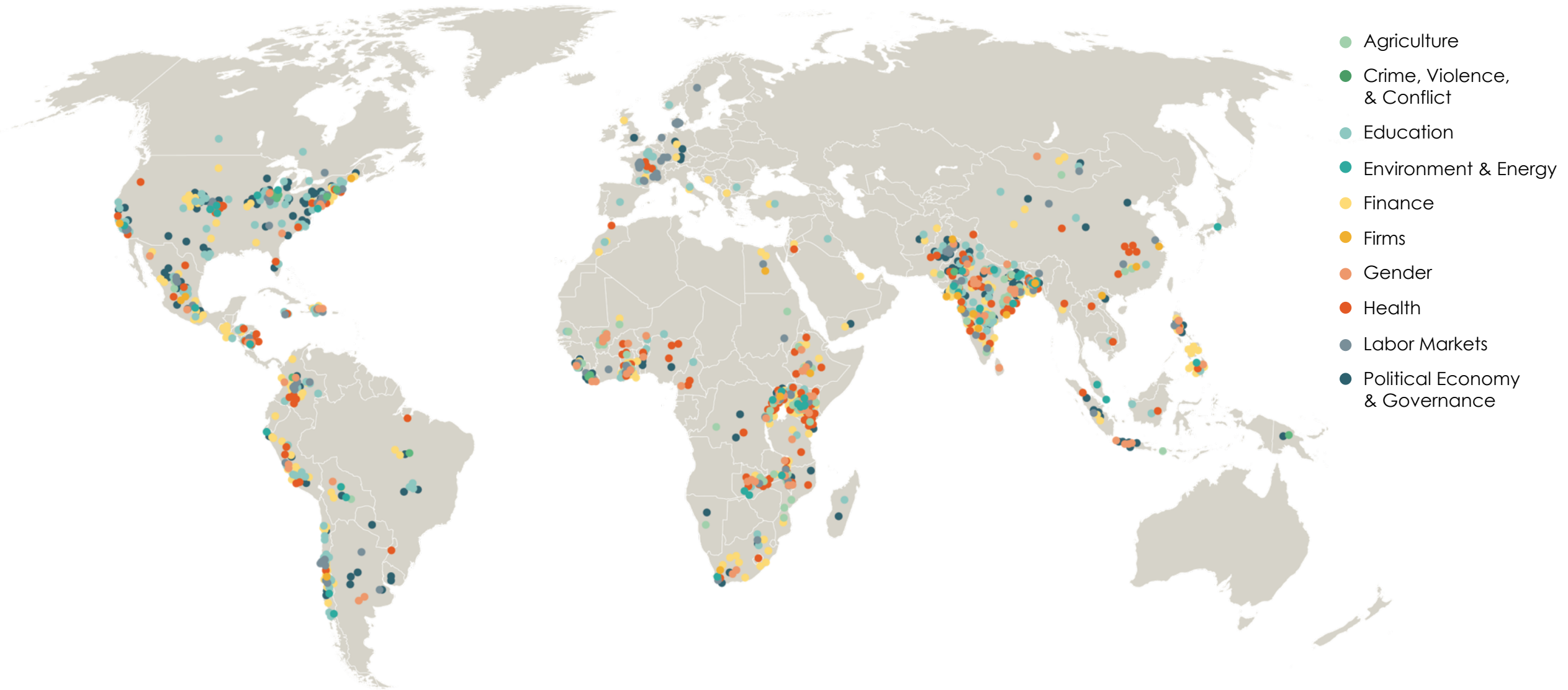
Cillian Nolan, Associate Director, J-PAL Europe
Kyiv, Ukraine
5 July 2019



- I. Framework and Scope: What Can We Learn?
- II. Can Incentives Shift Bureaucrats' Behaviour?
- III. Audits: Can They Work?
- IV. Audits: Principles for Better Design
- V. Audits: A Tool for Political Accountability?
- VI. Conclusion



Globally informed: 941 randomized evaluations in 81 countries



Locally grounded: Six regional offices; hundreds of close govt & NGO partners



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Research

We fund innovative new research and help carry out affiliates' projects on the ground.



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We synthesize research results, build partnerships, lend technical assistance, and embed staff.



Capacity building

We lead executive trainings and develop rigorous online education to build sustainability.

Governance Initiative

- Started in 2011
- Funded by UK Department for International Development
 - Hewlett, DFID, anonymous donor
- Funds randomized evaluations on:
 - Participation in the political and policy process
 - Reducing corruption and leakages
 - Improving state capacity
- Focus on lower and middle-income countries
- Chaired by Ben Olken (MIT) and Rohini Pande (Harvard)

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Some economic considerations

- Private benefit vs. social benefit
 - Social benefits are total benefits to society, both individual benefits + external benefits to third parties
- Transfers vs. efficiency costs
 - An 'efficiency' cost reduces the total amount of economic output
 - A 'transfer' moves money from one person to another but does not change the total amount of resources available to society
 - Transfers can be undone through other transfers (e.g. reducing wages), but efficiency costs represent a net social loss

The principal-agent framework

- Two-part **principal-agent problem**: Governance improves when “agents” are motivated to act in the best interest of the “principal.”
- **Part 1: Principal: Citizens or voters | Agent: Elected officials**
 - Logic: Officials should be motivated to align policies with voters’ interests
- **Part 2: Principal: Elected officials | Agent: Civil servants**
 - Logic: Civil servants should be motivated to implement policies as officials intend
- **Fundamental question: How best to motivate?**



What can randomised evaluations tell us? For example:

- **Provide one way to get around difficult measurement challenges**
 - Random assignment allows us to measure causal impact of different policy interventions on different aspects of corruption
- **Offer insight into the power of varying forms of bureaucratic incentives**
 - Can performance pay drive agents to collect more taxes, or procure higher-quality goods?
 - What about non-monetary forms of incentives?
- **Underscore the power of audits and offer insights toward optimal design**
 - Offer insight into why third-party audits are likely to be more effective...
 - And why information may be ineffective without deterrence
- **Test whether information about corruption can drive political accountability**
 - Publicizing mayors' audit records during elections in Brazil

What might this mean for Ukraine and the region?

- Ideas for aligning bureaucratic incentives with efforts to reduce leakage
- Strategies for strengthening tax collection efforts
- Insights for audit design
- Maximising power of media
- Providing information for electoral accountability

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Key policy questions

- Can we better structure incentives for agents tasked with functions such as procurement or tax collection?
- These “agents of state authority” often face a mismatch between the goals of government and the goals of those with whom they interact
- Incentives could plausibly either:
 - incentivize agents to collect more revenue; or
 - raise bargaining power of agents with taxpayers, leading to higher bribes.
- Three examples from Pakistan evaluate the impact:
 - Performance pay for property tax agents
 - Preferential postings for property tax agents
 - Performance pay or greater autonomy in procurement

Incentives I: Performance pay for tax collectors in Pakistan

- Randomized experiment on property tax in Punjab, Pakistan
- Tax inspectors were randomly assigned to one of three treatment arms or a comparison group:
 - Revenue: “high-powered incentives”, equal to 30% of revenues above historical benchmark, or almost double their pay for some agents
 - Revenue plus: incentives as above but adjusted depending on taxpayer satisfaction, assessment accuracy
 - Flexible bonus: managers awarded agents bonuses based on all of the above plus a director’s rating
- 16,000 individual taxpayers surveyed to measure satisfaction, accuracy of property assessments

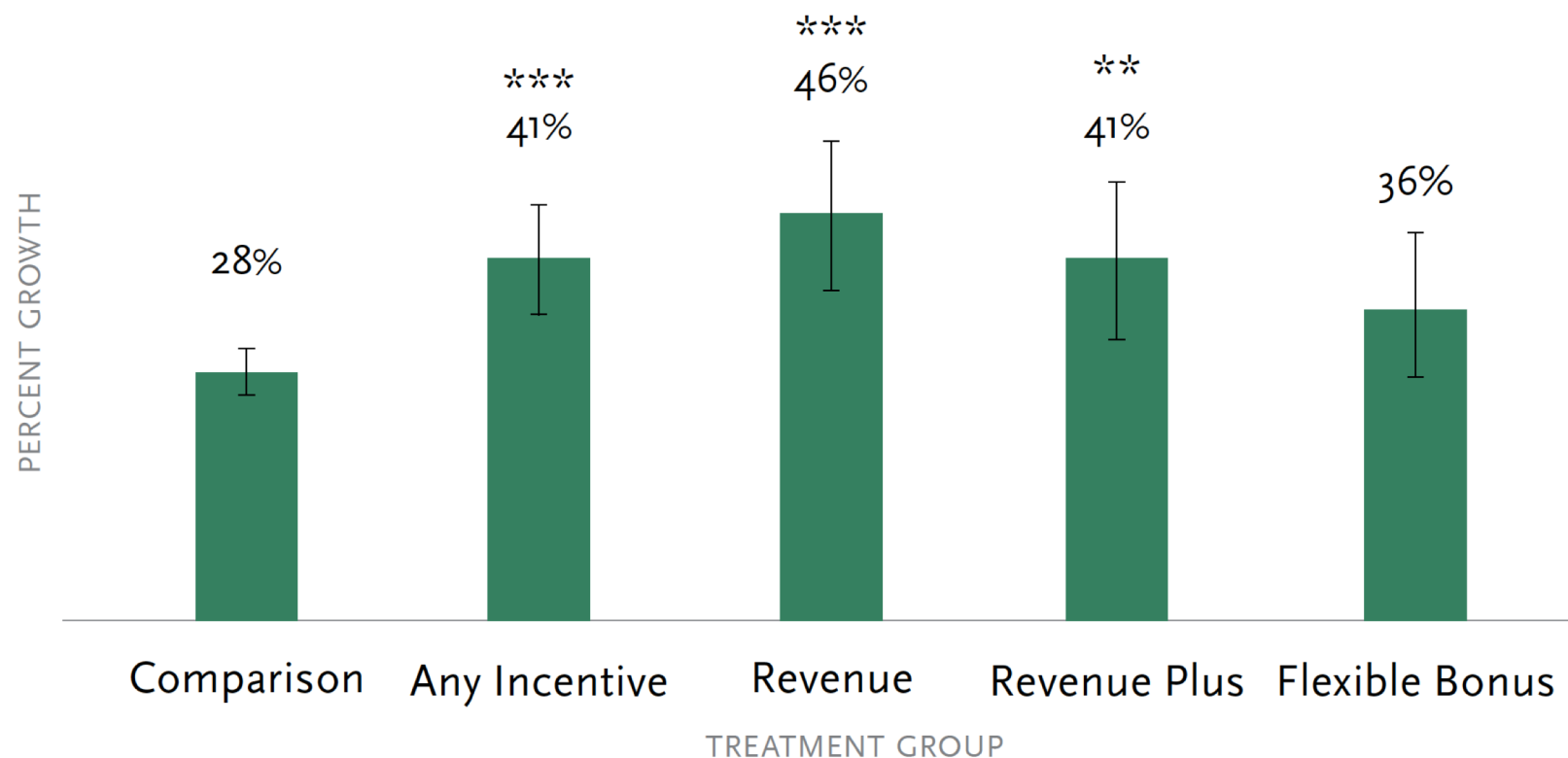
Khan, Khwaja, and Olken 2016

Incentives I: Performance pay for tax collectors in Pakistan

Property tax revenue growth increased by up to 64% over control

Purely revenue-based model had greatest impact on tax revenue.

FIGURE 1. INCENTIVE PAY SCHEMES LED TO SIGNIFICANT GAINS IN PROPERTY TAX REVENUE.



Khan, Khwaja, and Olken 2016

Note: Error bars represent 95% confidence intervals. Statistically significant difference relative to the comparison group is noted at the 1% (***) or 5% (**) level.

Incentives I: Performance pay for tax collectors in Pakistan

- Complex incentive schemes may have yielded lower returns due to uncertainty on nature of reward
- Revenue increase largely driven by expansion in the tax base
 - Officials in the three treatment arms added or reassessed 86% more properties than those in the comparison group
 - Suggestive data that these homes were previously known to tax collectors
- Taxpayers in treatment areas reported paying higher bribes (\$6 more, or a 32% increase over comparison group)
- Performance pay was cost-effective: it yielded returns of 15-30% on average, 35-51% in revenue-only group

Khan, Khwaja, and Olken 2016

Incentives II: Performance-based postings in Pakistan

- One third of tax inspectors are transferred to new posts each year—some postings more desirable than others. Can the ability to express preferences over this transfer act as a kind of incentive?
- Officials were randomly assigned to groups of roughly 10 teams. Some groups implemented a performance-based system and within these, some awarded choice of posting based on tax assessment, others on tax recovery. Groups were re-randomized at end of first year.
- Treatment groups saw revenue growth 41% higher than control.
- The scheme imposed no additional costs on the government and led to an increase in tax revenue about 3/4 as large as performance pay

Khan, Khwaja, and Olken 2019

Incentives III: What about offering more autonomy?

- Bandiera, Best, Khan, and Prat (2018) test the impact of both performance incentives and more autonomy in ensuring efficient procurement in Punjab, Pakistan
- Efficiency in procurement is difficult to measure:
 - goods required vary tremendously so it is difficult to measure quality;
 - difficult for monitors to establish;
 - procedural delays account for a large part of the problem;
 - outcomes are not measured here so an emphasis on rule-following trumps better quality.
- Key question: is it more effective to incentivize and reward savings by procurement officers, or to give them more flexibility in procurement?

Bandiera, Best, Khan, and Prat (2018)

Incentives III: What about offering more autonomy?

- Challenge: procurement officers have limited ability to respond to incentives because all purchases must be approved by an auditor.
 - Existing incentives heavily weighted towards documentation over prices
- They randomised 600 procurement officers to four treatment arms
 - Incentives (gold, silver, bronze prizes for best performance)
 - Autonomy (more cash in hand, simpler audit procedure)
 - A mix of both
 - Control group
- Incentives ran up to two months' salary
- Autonomy: increased petty cash, larger budget disbursements

Bandiera, Best, Khan, and Prat (2018)

Autonomy reduced prices, incentives did not

- On average, the autonomy treatment reduces quality-adjusted prices by 8%, while incentives do not have significant effect
- Bandiera et al. use the share of payments made in the last month of the fiscal year as a proxy for misalignment between the procurement officer and auditor
 - Where their interests are aligned, incentives DID matter (prices ↓10%)
 - Where they are relatively more misaligned, officers responded more to autonomy treatment

Bandiera, Best, Khan, and Prat (2018)

Insights for policy

- A lot of interventions take the bureaucracy as fixed, but changing the structure of incentives within the bureaucracy can substantially help
- Performance pay incentives can shift performance where the agent has sufficient control...
- ...but worth exploring other potentially more cost-effective incentives as well, as well as improving autonomy (adherence to rules may come at expense of efficiency and savings).
- A reminder that officials at different levels tied to same processes may have misaligned incentives.

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Key policy questions

- Can top-down audits work even in highly corrupt environments? (Is there a risk that they simply create a transfer?)
- How useful is grassroots monitoring of public spending? Do we observe evidence of free-rider problems?

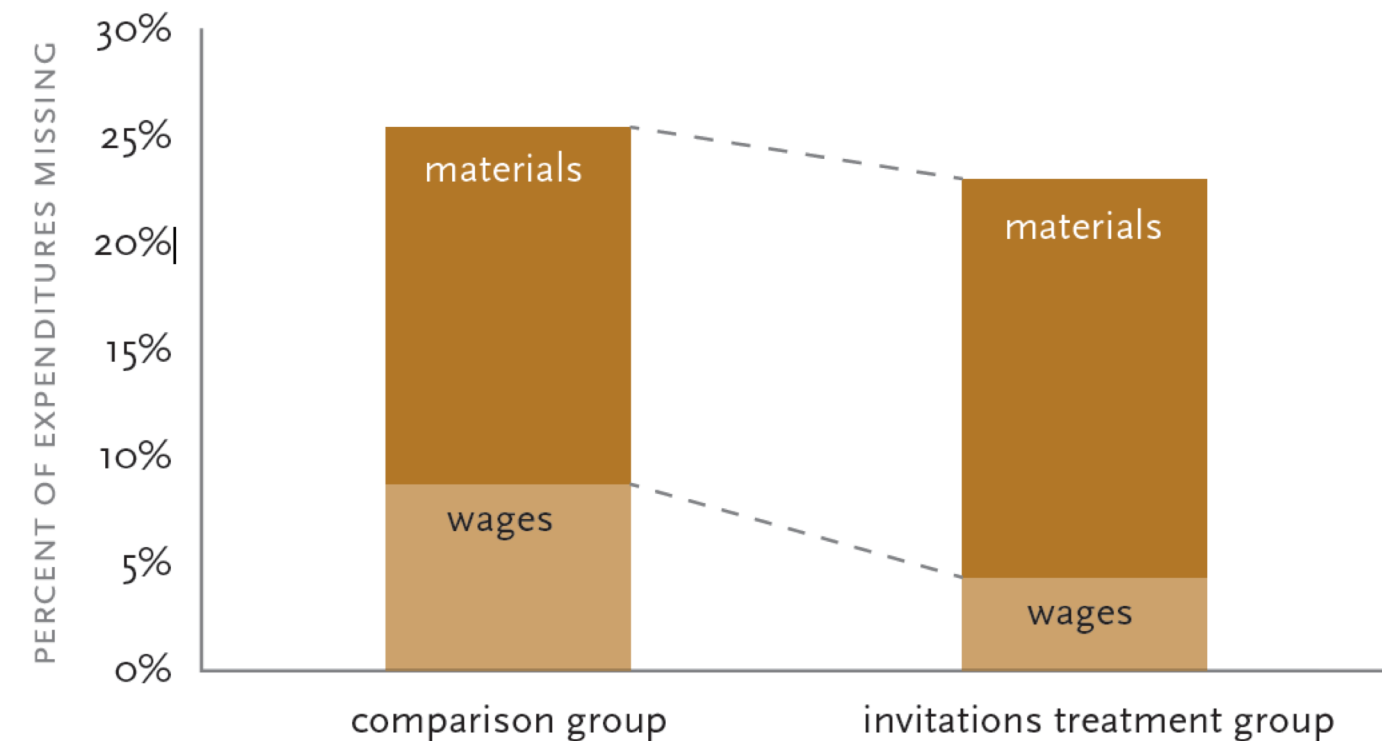
Government audits and community monitoring in Indonesia

- National program in Indonesia provided money for local infrastructure in 15,000 villages, 2003-04
- Typical village received ~\$9k to surface dirt roads, required village meetings
 - Corruption accounted for 20%
 - Probability of audit was 4%
- Two interventions:
 - Invitations to non-elite villagers to encourage grassroots community participation
 - Increasing probability of top-down audits to 100%
- Audit risk was largely social sanction, not legal



What was the impact of government audits?

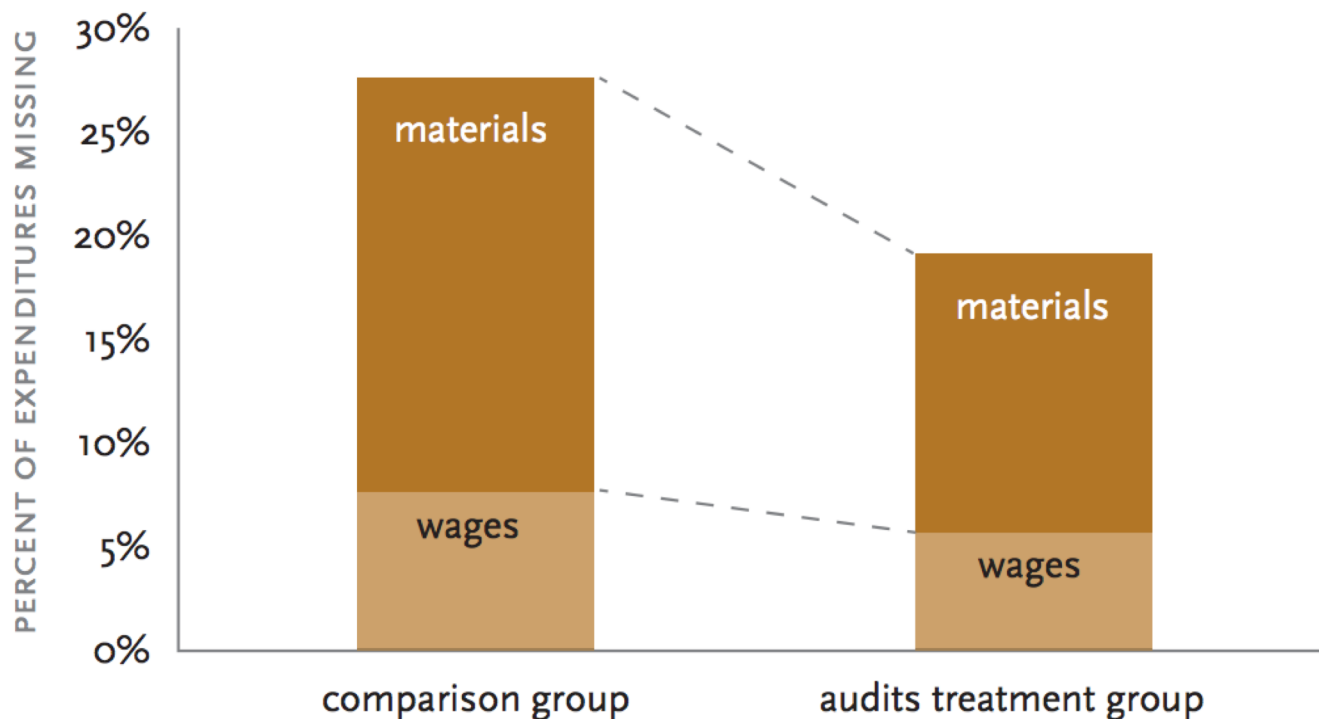
FIGURE 1: EFFECT OF INVITATIONS ON MISSING EXPENDITURES



- While the invitations designed to increase grassroots participation did lead to increased attendance at village meetings, they did nothing to reduce missing materials costs
- They did, however, reduce missing wages, as villagers had more incentive to ensure they were paid

What was the impact of government audits?

FIGURE 2: EFFECT OF AUDITS ON MISSING EXPENDITURES



Top-down government audits reduced missing expenditures by 8.5 percentage points (from 27.7% to 19.2%)

In general, finds most theft is on quantities, not prices, since prices are easier to detect

Increased scrutiny from audits led to a switch from theft of materials to nepotism (more difficult to detect)—family members of project head were 14 percentage points more likely to work on project (from mean of 30 percent)

Audits were cost-effective

- Audits cost about \$500 each, but reduced missing expenditure by an average of \$1 165 per village.
- 100% audit probability in this setting does not equate with likelihood of legal sanction
 - Higher punishments could be an important complement
- Impacts measured here were short-term. Auditors might be bribable over time, particularly if they have a repeat relationship with villages.

Audits of corruption violations

- Setting: Brazil, where since 2003 municipalities have faced random audits by federal anti-corruption agency
- Trained audit teams matched accounts with actual funds spent, and verified delivery of public services
- Audit results are public; often disseminated via local media and widely used in political campaigns

Ferraz & Finan, 2008; Avis, Ferraz, & Finan, 2018.



Impact of audits on **corruption**

- Principal measure: irregularities classified by CGU as acts of moderate or severe corruption (excludes acts of mismanagement)
- Main sample: all audits conducted between July 2006 and March 2013.
- Out of the 1,949 municipalities audited, 14 % audited multiple times: 253 audited twice, 18 three times, and one municipality four times
- Municipalities w/ previous audit saw **7.9% fewer acts of corruption** compared to those undergoing first audit. Probably a lower bound due to documented spillovers.
- Those not audited but next to audited municipalities **and with access to local media** also experienced decline in corruption.
 - Where AM radio was present, audit neighbors saw a 7.5 % reduction in corrupt acts relative to control.
 - Audit neighbors with access to local TV saw a 10.4 % reduction

Avis, Ferraz, & Finan, 2018

Policy Implications

- Even entrenched corruption can be susceptible to change and audits play an important role here.
- One potential lever is varying the (perceived) probability of audit; similar other is the experience of being audited.
- Policy recommendation is of course not for 100% audit rate, but difficult to suggest optimal rate
- Important to consider spillover effects of audits when considering design

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Reforming pollution audits in India

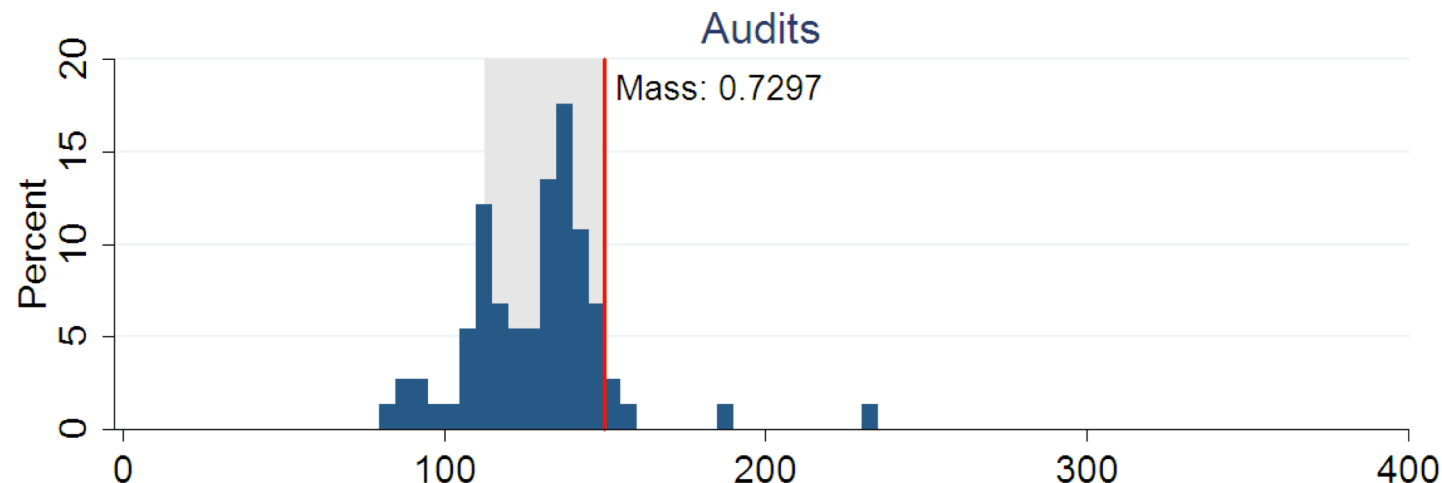
Setting: Gujarat, India, where third-party audits for high-pollutant plants were contracted by plants directly, creating a conflict of interest

Audit reporting was corrupt under the status quo, and reports highly clustered just below the regulatory standard (red line)

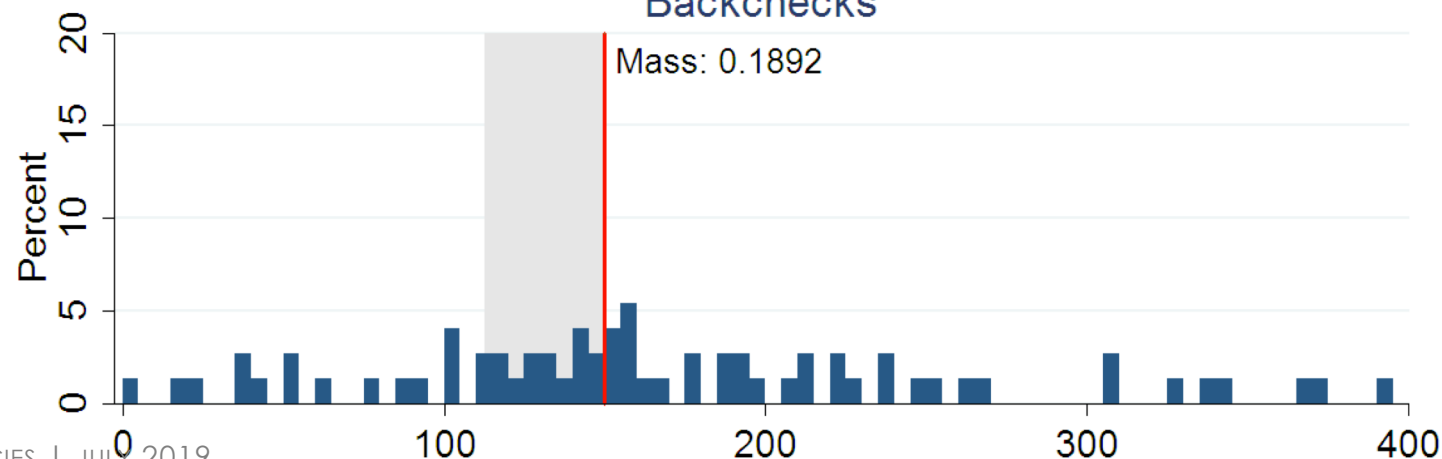
Duflo, Greenstone, Pande, and Ryan 2013

Suspended particulate matter, mg/Nm³

A. Control, midline



Backchecks

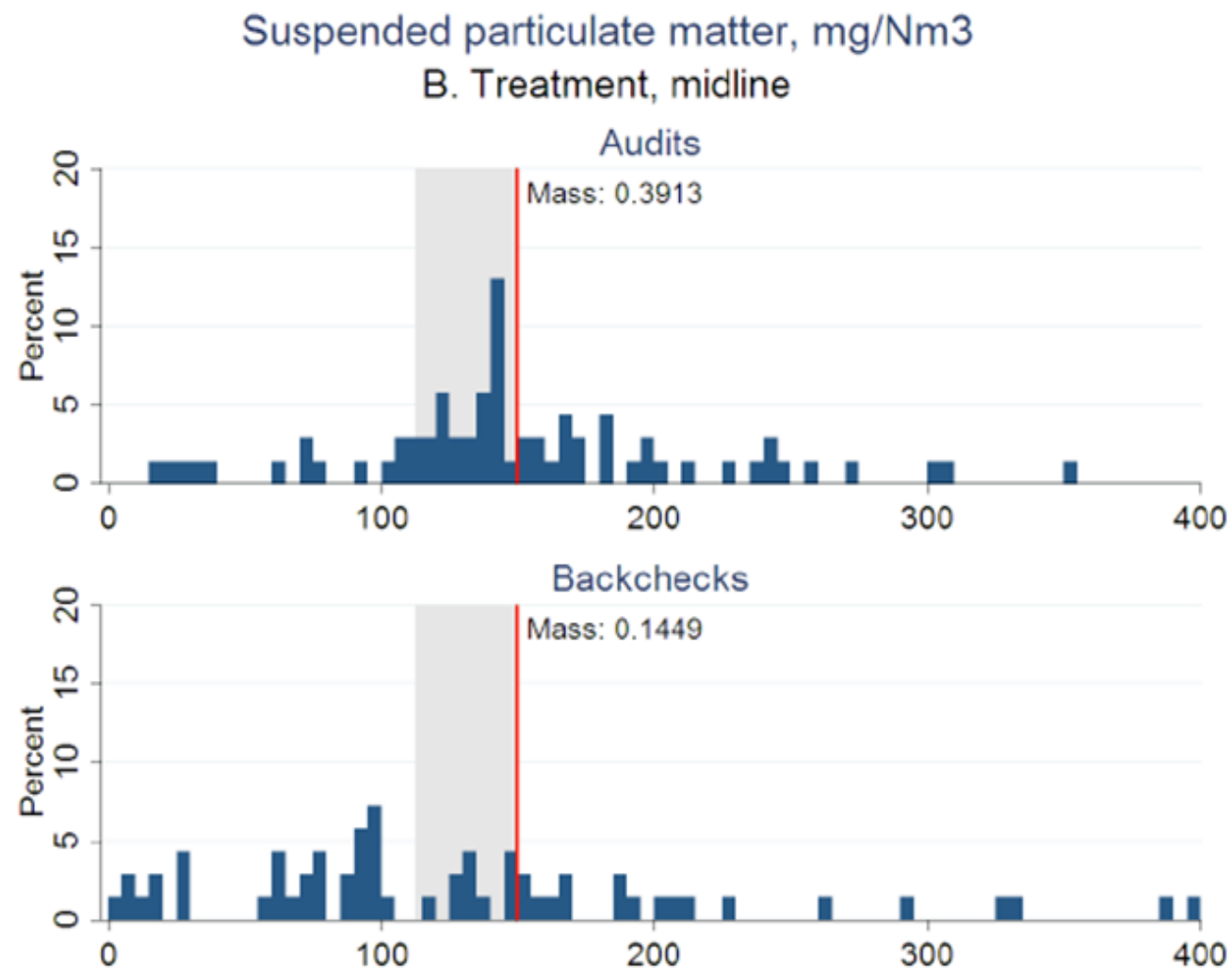


Introducing third-party audits

- Gujarat Pollution Control Board and Duflo, Greenstone, Pande, and Ryan designed an audit reform with four main components:
 - Random assignment of auditors to firms
 - Fixed payments from a central pool
 - Monitoring of auditors through backchecks (20%)
 - Bonus payments to auditors for accurate reporting
- Goal: to change the structure of the audit market so that it would incentivize accurate reporting, and pollution abatement
- Two-year experiment (2009-11)

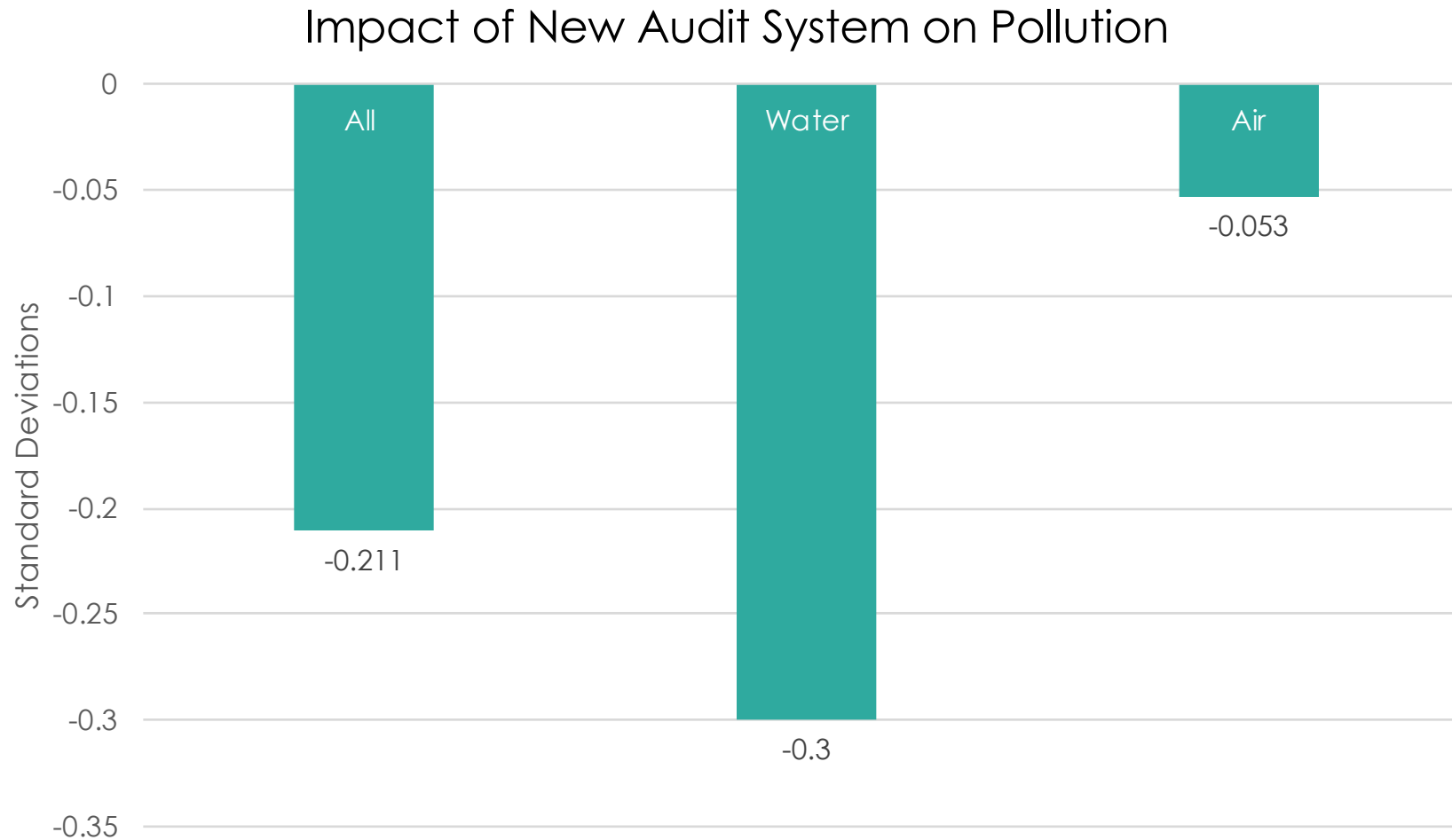
Duflo et al, 2013

Under new auditing system, auditors were more truthful



Duflo et al, 2013

New system also caused plants to reduce pollution



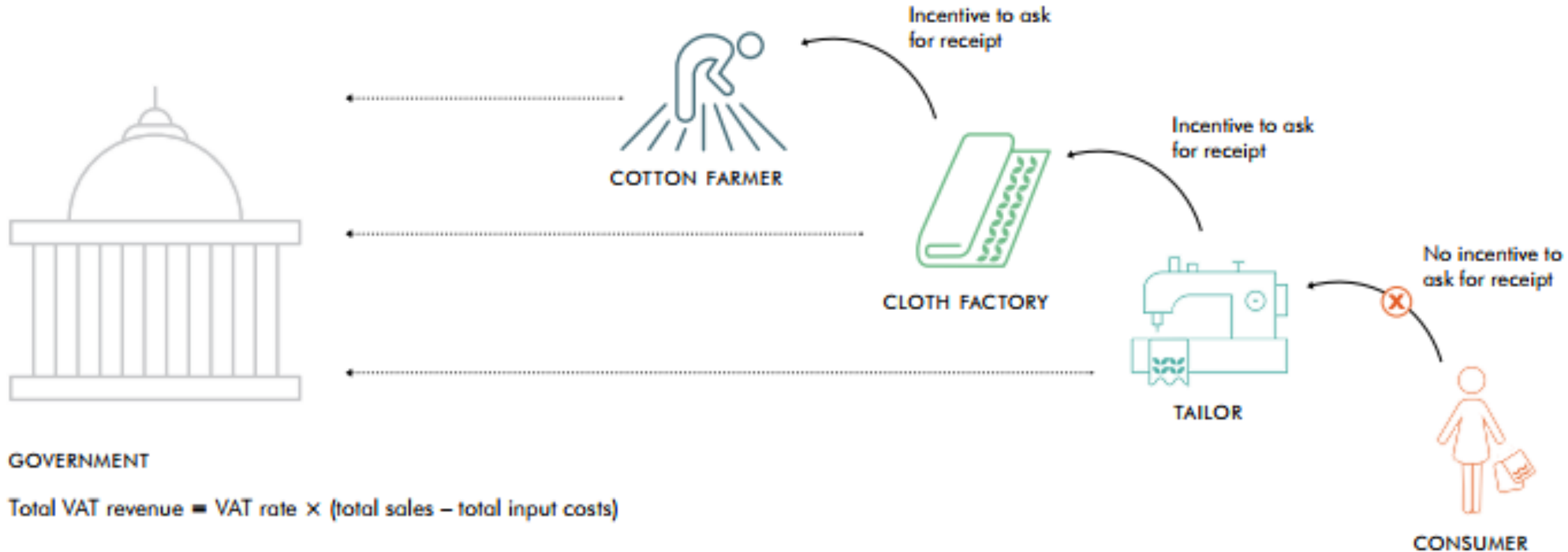
Duflo et al, 2013

Shifting firm behaviour in Chile: Strengthened deterrence

- Pomeranz (2015) explores several methods for strengthening VAT collection in Chile, where VAT accounts for ~half of tax revenues. In Chile, few firms have to automatically report paper trail to authorities
- Value Added Taxes (VAT) are often thought of as self-enforcing
 - Auditable paper trail created
 - Downstream clients have an incentive to ask for receipts (to deduct costs)
 - No gains from collusion: each firm has opposing incentives
- But consumers may have no incentive to ask for receipts, and firms do not always report information about suppliers

Pomeranz 2015

Shifting firm behaviour in Chile: Strengthened deterrence



Increasing firms' perceived probability of tax audits

- Randomly assigned over 400,000 small and medium firms to receive one of three letters:
 - Deterrence Letter (informed firms they were being monitored)
 - Tax Morale Letter (emphasised high compliance rate in Chile)
 - Placebo Letter (offered information about website)

- Deterrence letter increased monthly VAT payments by 7.6 percent
- Analysis showed the shift was in VAT paid on final sales, not input costs: that is the part not covered by the paper trail
 - Evidence of paper trail's deterrent effect
- No signif. impact from placebo or morale letters

Pomeranz 2015

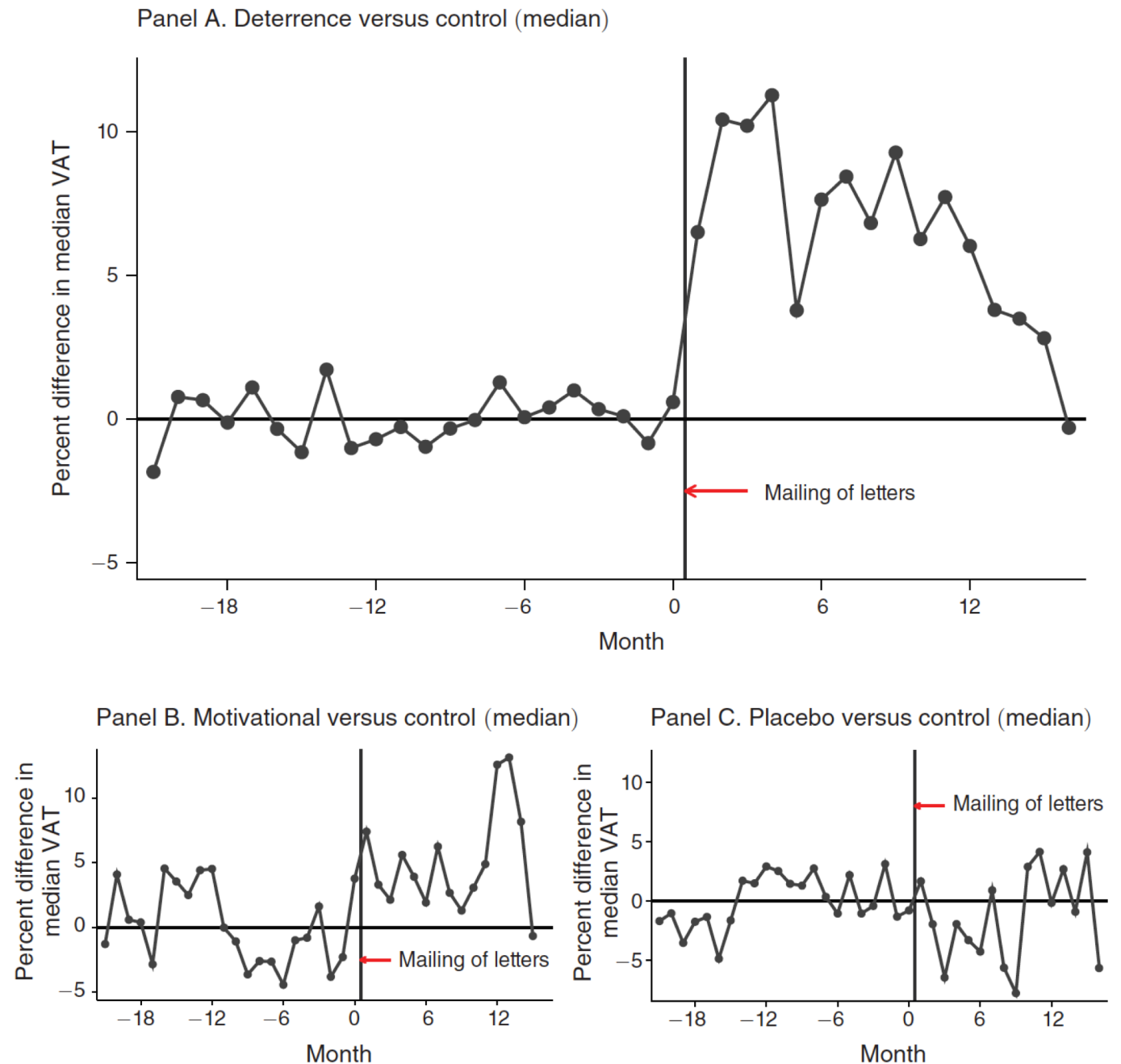
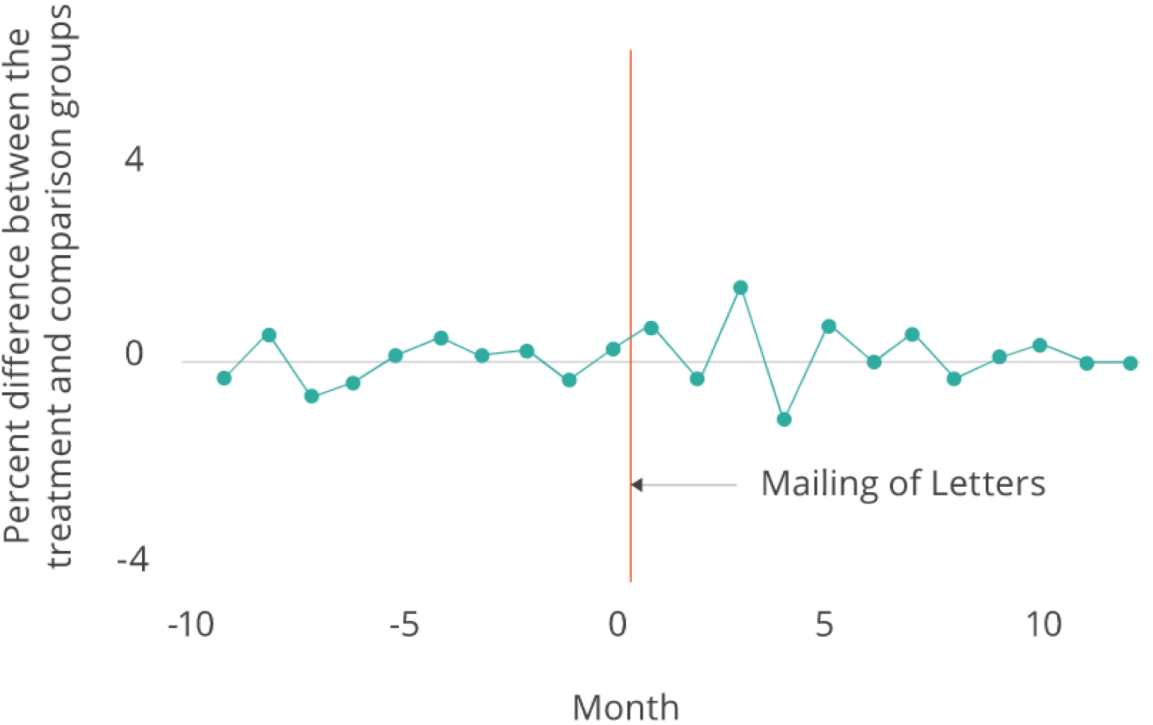
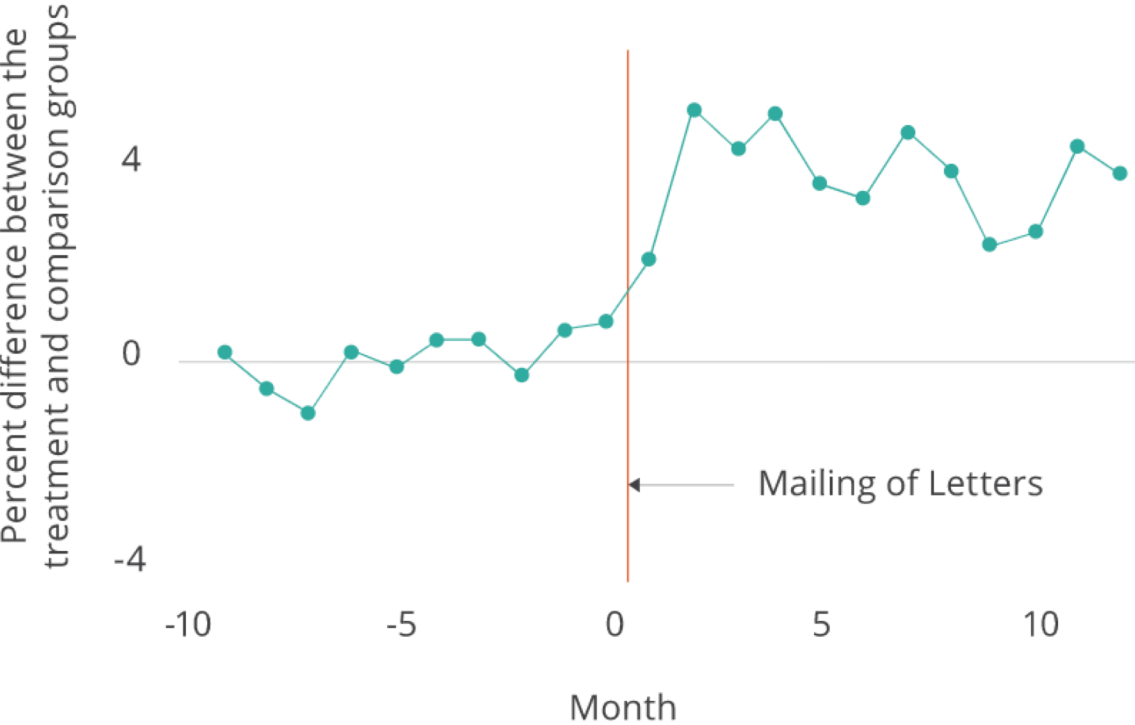


FIGURE 2. IMPACT OF THE THREE TYPES OF LETTERS

Intermediary Sales: Probability of declaring more sales compared to the previous year



Final Sales: Probability of declaring more sales compared to the previous year



Upstream spillover effects

- In a parallel experiment, an audit announcement was sent randomly to half of 5,600 micro firms. Control group received no letter.
 - These smaller firms probably perceived audit risk to be quite low.
- All firms were audited six months later. Information was gathered on trading partners from up to 3 months before announcement.
- VAT declarations increased not just in treated firms, but also upwards along the supply chain, affecting suppliers but not clients. Monitoring a firm increases tax payments by its suppliers.
 - Indicates that the impact on compliance was not just information sharing.

Policy Implications

- Information and deterrence can work together powerfully
 - In Gujarat, eliminating conflict of interest by outsourcing audits to private firms provided much higher quality information and led to reduction in pollution
 - Increasing the perceived probability of audits in Chile had powerful deterrent effect, including along the supply chain
- Spillover effects can play a powerful role in enhancing deterrent effect of audits...
- ...but this depends on the credibility of deterrent threat and associated sanctions
- Different European countries have recently introduced incentives for consumers to request VAT receipts to strengthen accountability at end of chain

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Back to Brazil

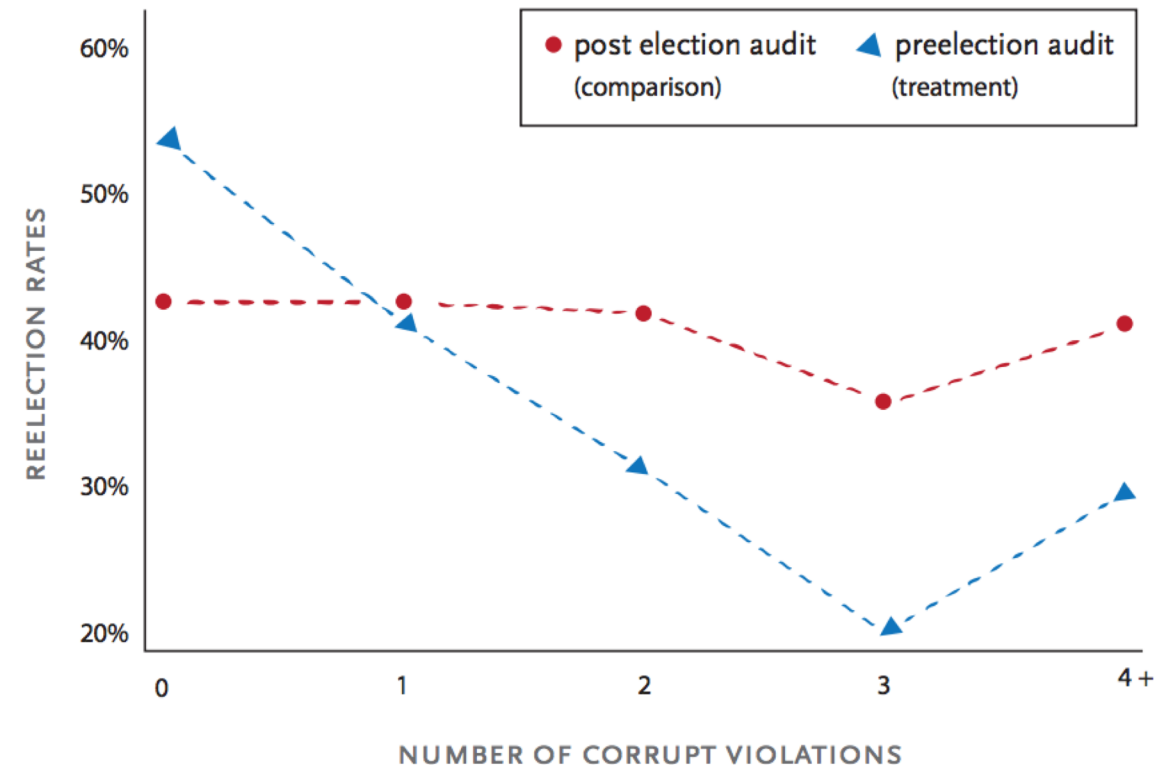
- Do audits deliver more political accountability in elections?
- Ferraz and Finan (2008) compare electoral outcomes for mayors in municipalities audited just before and just after the 2004 election
- Avis, Ferraz, and Finan (2018) seek to explore how audits can promote both political and judiciary accountability



Impact of audits on elections

- Researchers compared municipalities in which results of audits were released before vs. after local elections
- Releasing audit results before elections **reduced likelihood of reelection by an average of 7 percentage points** in municipalities with at least 2 violations
- Impact of audit results **increased with number of violations reported**, suggesting higher levels of corruption were more severely punished

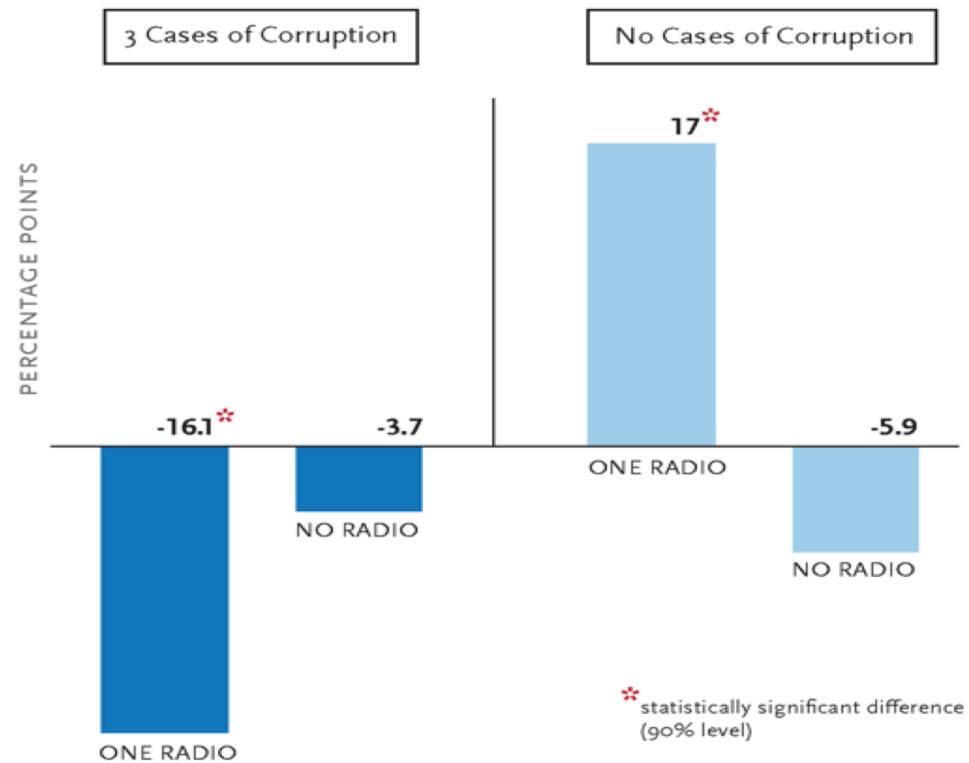
FIGURE 1: REELECTION RATES BY CORRUPTION LEVEL



Ferraz & Finan, 2008

Role of local media

Presence of a radio station enhanced negative effects on reelection for corrupt politicians and positive effects for non-corrupt politicians.



Ferraz & Finan, 2008

Mechanisms

Avis, Ferraz, and Finan (2018) use the broader data (2006-2013) to test four potential channels for reduced corruption among mayors:

- *political selection* (corrupt mayors voted out)
- *electoral discipline* (mayors who want to be re-elected refrain)
- *legal disciplining* (mayors fear reputation or legal costs)
- *political entry* (audit policy spurs new type of mayoral candidates)

They estimate that much of the impact (72%) is driven by legal disciplining effects, with the remainder largely driven by this desire for re-election.

Avis, Ferraz & Finan, 2018

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Other relevant areas of research

- Funds flow reforms and e-payment systems being introduced to release leakage and ensure efficient delivery of benefit programs
- Reducing leakage from major social programs.

Main takeaways

- Aligning bureaucratic incentives is an important part of designing efficient tax and procurement systems.
- Agents do respond to both pay-related and other incentives.
- Audits can play a significant role in reducing corruption, even when capacity may be low or when corruption is entrenched.
- Credibility of deterrence and sanctions matters. Information alone unlikely to be enough.
- Voters care about corruption, and update their beliefs about politicians and change their voting behavior in response to credible information.
- Local media can enhance political accountability and candidate selection. Dissemination is crucial to achieving political accountability.

How can J-PAL work with you?



Evaluate

Conduct a randomized evaluation of your organization's program to better understand its impacts.



Use evidence

Incorporate evidence from rigorous evaluations into your organization's policies and programs.



Build capacity

Participate in J-PAL Executive Education, enroll your team in an online course, or host a customized workshop to help build a culture of rigorous evaluation.



Open doors

Become a funding partner and join the movement to bring a rigorous, data-driven approach to reducing poverty and expanding opportunity for all.



Thank you.

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