Incentives and the Allocation of Authority in Organizations:
A Field Experiment with Bureaucrats

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Outline

Agency Problems: Rules and Incentives

- Agency problems can be addressed by
  1. Incentives that encourage right behavior
  2. Rules that curtail wrong behavior
- Different organizations use different combinations of rules and incentives
- Bureaucracies mostly use rules

Public Procurement

- Textbook example of moral hazard:

  Agent buys goods she won't use with money she doesn't own

  - Misalignment of interests $\Rightarrow$ low effort and/or corruption

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  - Misalignment of interests $\Rightarrow$ low effort and/or corruption

- Stakes are high
  - Spending on public procurement as GDP share in 2015 (OECD):
    - United States: 9.35%
    - Average OECD country: 13.18%
  - Potential for large savings (Olken and Pande 2012)

Policy Proposals: Incentives and Rules

- Provide purchasing managers with monetary incentives to achieve value for money
  - Eg Laffont and Tirole's (1994) scheme to avoid regulatory capture
- Subject purchasing managers to strict auditing – or maybe not.
  - OECD Third Principle for Integrity in Public Procurement: "The management of public funds should be monitored by internal control and internal audit bodies."
  - Kelman (1990), *Procurement and Public Management: The Fear of Discretion and the Quality of Government Performance*.

This Paper

- First experimental evidence on the effects of rules and autonomy in the public sector.
- Field experiment to generate exogenous variation in *autonomy* and *incentives* faced by procurement officers in Punjab, Pakistan
- Theoretical framework to illustrate how results are informative about the relative alignment of the implementing bureaucrat vs supervisor with the interests of the organisation

Outline

Procurement in Punjab, Pakistan

- Legal authority for public procurement is vested in **Procurement Officers** (POs)
- POs manage **Public Bodies**, allocated budget under different accounting heads (salary, repairs, etc.), including procurement, by the Finance Department
- POs required to submit all expenditures to an independent federal agency - office of the **Accountant General** (AG) - for pre-audit *before* payment can be made.
- AG has offices in each district, responsible for POs in that district

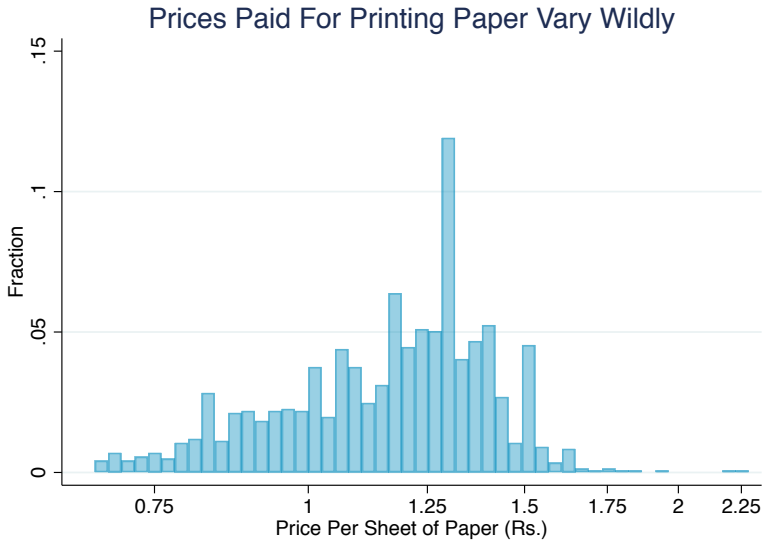
A Typical Procurement Process

1. A demand for an item goes to the PO for approval
2. PO surveys the market for vendors and rates for the items
3. PO receives the goods from the vendors
4. PO sends a request for payment (bill/voucher) to the AG office
5. AG sanctions payment to the vendor or demands more paperwork.
   - POs cannot pay vendors before authorization from AG office

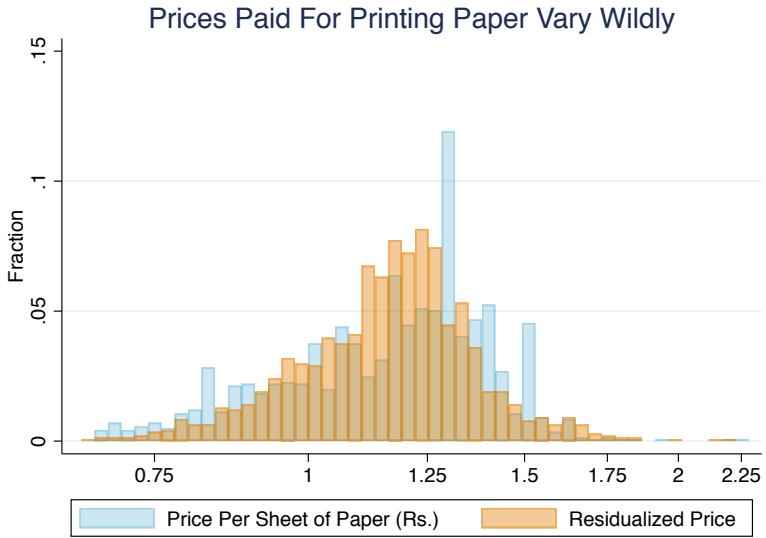
Measuring Value for Money

- We focus on generic (off-the-shelf) goods.
- These account for a large share of government budget
- Bought by many consumers and produced by several suppliers
- Measurable (with some effort!) and comparable performance
- Most are sold in competitive markets, so everybody should pay the same price. And yet. . . .

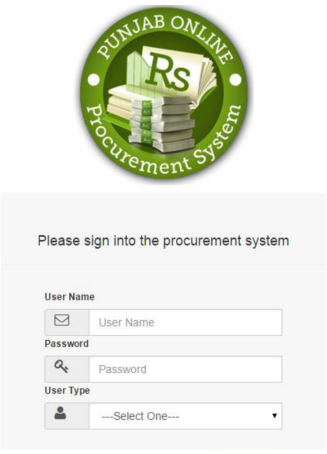
Different POs Pay Very Different Prices for Exactly the Same Good



Different POs Pay Very Different Prices for Exactly the Same Good

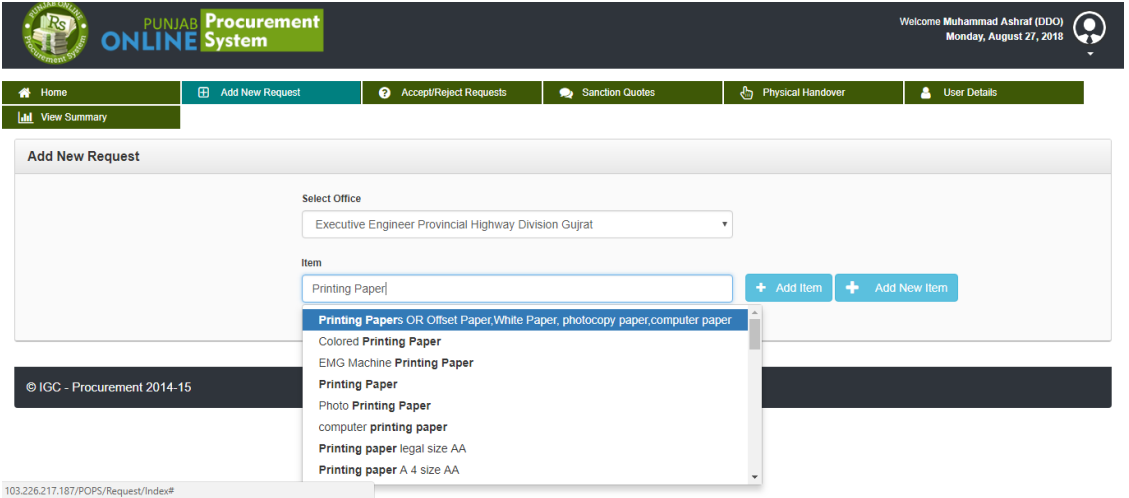


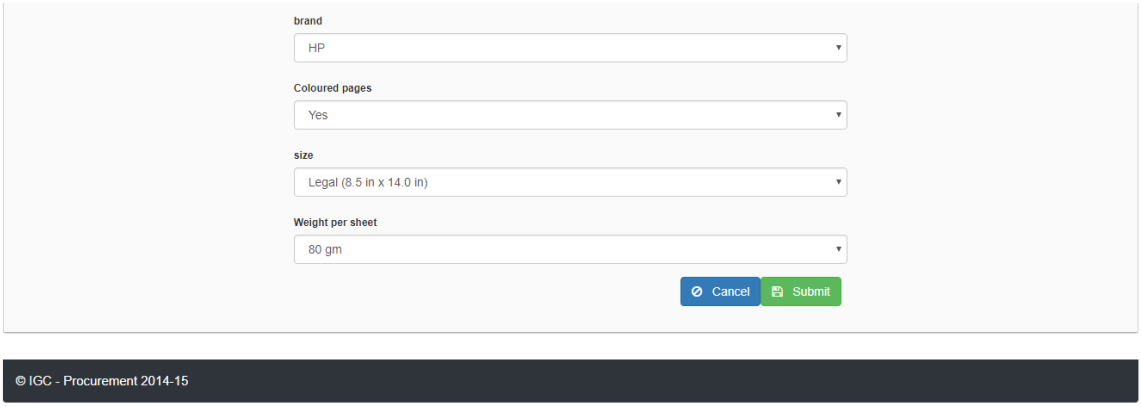
Together with Punjab Procurement Regulatory Authority (PPRA) and Punjab Information Technology Board (PITB), we set up an E-Governance platform: Punjab Online Procurement System (POPS)



POPS Collects Detailed Spending Data

- Through POPS, office staff enter detailed data on what they are buying

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Yes
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Legal (8.5 in x 14.0 in)
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80 gm
Cancel
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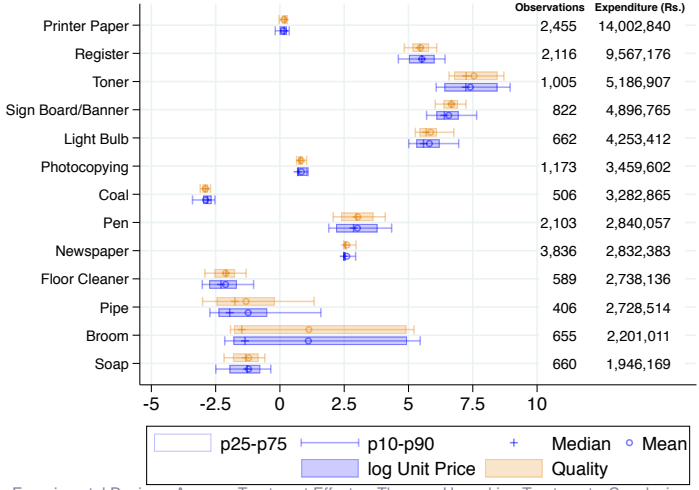
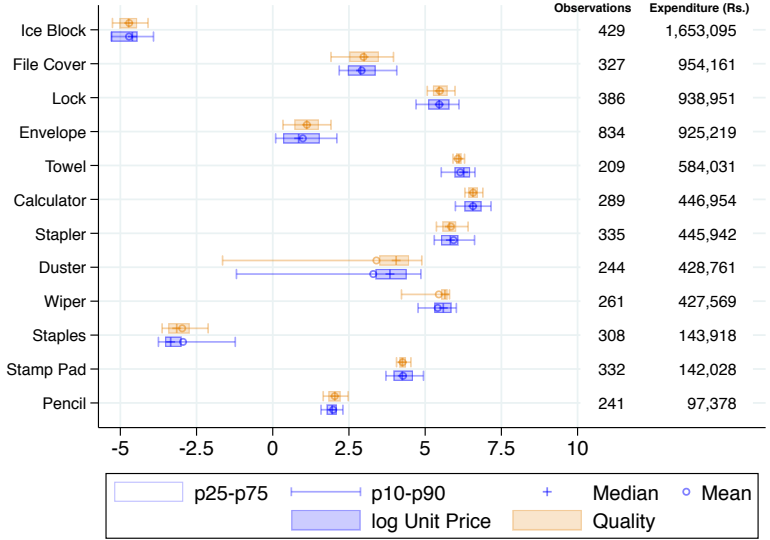
© IGC - Procurement 2014-15

A Rich Dataset on Public Procurement

- 25 goods, 21,503 purchases.
  Trim top/bottom 1% unit prices for each good → 21,183 obs



A Rich Dataset on Public Procurement



Outline

Subjects

- 688 Procurement Officers in charge of procurement of 778 Public Bodies
  - (88% in charge of 1 PB, 10% 2, 2% 3 or more)
  - take-up 85% –> sample contains 587 POs
- 26 Districts (out of 36) - cover over 80% of the population (110million)
- 4 Departments:
  - Agriculture (254 PBs)
  - Higher Education (404 PBs)
  - Health (32 PBs)
  - Communication and Works (60 PBs)

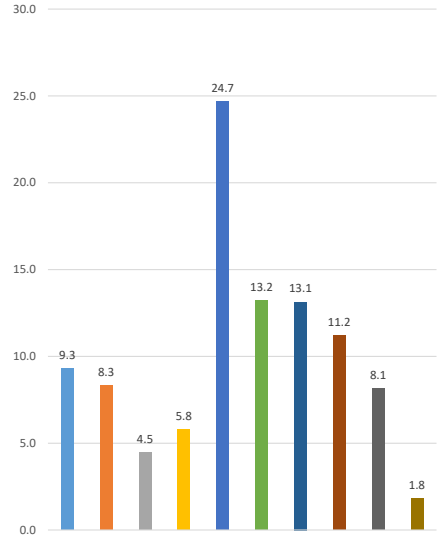
Incentive Treatment

- Twice per year, an independent commission awards 3 prizes

1. “gold”: 2 months wages, to the top 7.5%
2. “silver”: 1 month wages, to the next 22.5%
3. “bronze”: 0.5 month wages, to the next 45%
4. nothing to remaining 25%

- Commissioners: senior private sector auditor & head PPRA (co-chair), representatives of all departments (10 members)
- Data on quality adjusted prices provided by us

Autonomy Treatment



These are potential reasons for why DDOs don't achieve good value for money. In your experience how important is each of these?

- Only a limited number of vendors are willing to wait for delayed payment
- Vendors charge higher prices for delayed payment
- DDOs have nothing to gain by improving value for money
- DDOs are worried that if they change vendors to achieve better value for money this might raise red flags
- Budgets are released late so DDOs cannot plan appropriately
- AG/DAO requirements are not clear and they do not clear bills without inside connections or payment of speed money
- DDOs do not have enough petty cash to make purchases quickly.
- DDOs & office staff do not receive enough training on procurement procedures
- Cost centers cannot roll their budget over into the following year
- Other

Autonomy Treatment

- Removes rules that are set to limit autonomy and corruption
  - Allow “Cash in hand”, Rs 100,000 ($1,000)
  - Give budget in two timely installments instead of four
  - Remove AG discretion on documents to require for audit
- All three can reduce price if used properly but can lead to corruption
  - embezzle cash
  - more flexibility to steal
  - AG can’t stop new loopholes

Timeline

Year 1: July 2014 – June 2015	
06/14	Cost Centers allocated to treatment arms
07–08/14	Trainings on POPS and treatment brochures
08–09/14	Follow-up trainings on POPS
03–04/15	Baseline Survey
Year 2: July 2015 – June 2016	
07–10/15	Refresher trainings on treatments and POPS
10/15	Cash in Hand rolled out
03–04/16	Midline Survey
04/16	Performance Evaluation Committee Midline Meeting
06/16	Experiment Ends
Post-Experiment	
08-09/16	Endline Survey Part 1 & Missing Data Collection
02/17	Performance Evaluation Committee Endline Meeting
02–03/17	Endline Survey Part 2

Variable	N	(1) Incentives Mean/SE	N	(2) Autonomy Mean/SE	N	(3) Both Mean/SE	N	(4) Control Mean/SE	T-test P-value (1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Number of Public Bodies	148	1.49 (.0839)	150	1.33 (.0667)	153	1.45 (.0681)	136	1.26 (.0545)	.153	.742	.0303**	.218	.432	.0365**
Agriculture	148	.297 (.0377)	150	.36 (.0393)	153	.327 (.038)	136	.301 (.0395)	.251	.582	.939	.544	.296	.645
Communication and Works	148	.0608 (.0197)	150	.02 (.0115)	153	.0588 (.0191)	136	.0515 (.019)	.0736*	.942	.734	.0837*	.149	.786
Health	148	.0473 (.0175)	150	.0333 (.0147)	153	.0392 (.0157)	136	.0441 (.0177)	.541	.731	.899	.785	.637	.836
Higher Education	148	.595 (.0405)	150	.587 (.0403)	153	.575 (.0401)	136	.603 (.0421)	.89	.733	.887	.84	.78	.633
Year 1 Original Budget	148	6,017,233 (2,864,983)	150	10,209,334 (7,863,071)	153	11,344,636 (8,233,693)	136	10,659,822 (6,805,446)	.619	.547	.518	.921	.966	.95
Year 1 Final Budget	148	9,009,152 (3,565,036)	150	13,863,444 (9,073,693)	153	14,946,447 (8,615,323)	136	13,073,482 (7,546,271)	.621	.53	.618	.931	.947	.872
Year 1 Total Expenditure	148	8,433,276 (3,440,779)	150	12,945,346 (8,478,290)	153	14,036,940 (8,284,710)	136	10,240,016 (6,785,181)	.624	.538	.808	.927	.806	.727
Year 1 Share of Budget Spent	148	.893 (.00906)	150	.893 (.0104)	153	.878 (.0125)	136	.869 (.0145)	.979	.315	.151	.351	.177	.652
Year 1 Original Procurement Budget	148	5,464,891 (2,702,867)	150	7,751,860 (5,569,681)	153	9,490,174 (6,532,624)	136	8,366,379 (6,297,901)	.713	.574	.664	.84	.942	.902
Year 1 Final Procurement Budget	148	8,078,708 (3,415,806)	150	10,991,450 (6,699,019)	153	12,890,551 (7,159,879)	136	10,673,752 (7,152,640)	.7	.549	.737	.847	.974	.827
Year 1 Procurement Expenditure	148	7,609,503 (3,317,660)	150	10,109,477 (6,123,926)	153	12,193,201 (6,940,102)	136	9,583,936 (6,643,425)	.721	.556	.785	.822	.954	.787
Year 1 Share of Procurement Budget Spent	148	.886 (.0105)	150	.891 (.0102)	153	.88 (.0119)	136	.862 (.0134)	.766	.668	.15	.476	.086*	.328
Year 1 Share of Procurement in Original Budget	141	.965 (.00977)	144	.979 (.00861)	150	.978 (.00778)	132	.971 (.0113)	.309	.314	.728	.949	.566	.585
Year 1 Share of Procurement in Final Budget	148	.872 (.015)	150	.906 (.0123)	153	.88 (.0141)	136	.882 (.0161)	.0857*	.697	.658	.176	.237	.937
Year 1 Share of Procurement in Spending	148	.779 (.0169)	150	.806 (.0144)	153	.777 (.0165)	136	.764 (.0188)	.21	.947	.563	.181	.0708*	.602
Year 2 Original Budget	148	8,000,973 (5,246,844)	150	2,994,857 (1,217,036)	153	4,116,475 (1,527,273)	136	9,184,126 (6,944,377)	.351	.472	.891	.567	.359	.453
Year 2 Final Budget	148	9,951,887	150	5,258,172	153	7,067,398	136	12,496,735	.391	.616	.795	.506	.374	.514

Treatment Effects I

- We estimate

$$p_{igto} = \alpha + \sum_{k=1}^{3} \eta_k \text{Treatment}_o^k + \beta q_{igto} + \rho_g s_{igto} + \delta_s \text{Department}_o \times \text{District}_o + \gamma_g + \varepsilon_{igto}$$

  - p_{igto} is log unit price,
  - s_{igto} size of purchase,
  - q_{igto} is good quality,
  - δ_s, γ_g stratum, good FEs.
  - Weight by control expenditure shares,
  - cluster ε_{igto} by public body.

Identification

$$p_{igto} = \alpha + \sum_{k=1}^{3} \eta_k \text{Treatment}_o^k + \beta q_{igto} + \rho_g s_{igto} + \delta_s \text{Department}_o \times \text{District}_o + \gamma_g + \varepsilon_{igto}$$

- η_k: causal effect of treatment k on quality-adjusted prices if

1. treatment does not affect control POs e.g. through AG. SUTVA
   - Experimental POs are a small fraction of total POs supervised
   - Effect on prices paid by control DDOs does not depend on number of treated in same office
2. quality not affected by treatment. bad control
   - no effect on quality, very similar Diff in Diff results
3. q_{igto} adequately captures quality

Measuring Quality

- Method 1: control for all goods' attributes in price regression (*fine* measure)
- Method 1b: aggregate by "pricing" attributes in control group. (*scalar* measure)

$$p_{igto} = \mathbf{X}_{igto}\lambda_g + \rho_g s_{igto} + \gamma_g + \varepsilon_{igto}$$

s_{igto} is the size of the purchase, $\mathbf{X}_{igto}$ are attributes of the item

  - Use $\hat{\lambda}$s to control for quality $\Rightarrow q_{igto} = \sum_{j \in A(g)} \hat{\lambda}_j X_j$ where $A(g)$ is the set of attributes of good g

- Method 2: control for simpler measure of quality (*coarse* measure)
  - Use attributes with large $\hat{\lambda}$s to classify purchases into "high" or "low" quality
- In progress: Use ML to a) find optimal coarseness; b) allow more nonlinearity

Outline

Treatment Effects

	No Quality	Detailed Attributes			Simple Quality	
	(1)	(2)	(3)	(4)	(5)	(6)
	Price					
Incentives	-0.028					
	(0.038)					
	[0.498]					
Autonomy	-0.084					
	(0.038)					
	[0.045]					
Both	-0.071					
	(0.041)					
	[0.121]					
Quality						
Item FEs	yes					
Item Attributes	no					
Simple Quality	no					
p(Incentives $\geq$0)	0.498					
p(Autonomy $\geq$0)	0.045					
p(Both $\geq$0)	0.121					
Observations	11,469					

Treatment Effects

	No Quality	Detailed Attributes			Simple Quality	
	(1) Price	(2)	(3)	(4) Quality	(5)	(6) Quality
Incentives	-0.028			0.016		0.019
	(0.038)			(0.030)		(0.023)
	[0.498]			[0.626]		[0.446]
Autonomy	-0.084			0.029		0.009
	(0.038)			(0.030)		(0.023)
	[0.045]			[0.359]		[0.721]
Both	-0.071			0.055		0.059
	(0.041)			(0.029)		(0.023)
	[0.121]			[0.083]		[0.017]
Quality						
Item FEs	yes			yes		yes
Item Attributes	no					
Simple Quality	no					
p(Incentives $\geq$0)	0.498					
p(Autonomy $\geq$0)	0.045					
p(Both $\geq$0)	0.121					
Observations	11,469			11,469		11,469

Treatment Effects

	No Quality	Detailed Attributes			Simple Quality	
	(1) Price	(2) Price	(3) Price	(4) Quality	(5) Price	(6) Quality
Incentives	-0.028	-0.031	-0.033	0.016	-0.027	0.019
	(0.038)	(0.031)	(0.032)	(0.030)	(0.035)	(0.023)
	[0.498]	[0.368]	[0.350]	[0.626]	[0.496]	[0.446]
Autonomy	-0.084	-0.087	-0.079	0.029	-0.082	0.009
	(0.038)	(0.032)	(0.031)	(0.030)	(0.034)	(0.023)
	[0.045]	[0.014]	[0.016]	[0.359]	[0.022]	[0.721]
Both	-0.071	-0.081	-0.075	0.055	-0.087	0.059
	(0.041)	(0.033)	(0.034)	(0.029)	(0.039)	(0.023)
	[0.121]	[0.024]	[0.037]	[0.083]	[0.038]	[0.017]
Quality			0.751			
			(0.029)			
Item FEs	yes	yes	yes	yes	yes	yes
Item Attributes	no	yes	no		no	
Simple Quality	no	no	no		yes	
p(Incentives $\geq$0)	0.498	0.368	0.350		0.496	
p(Autonomy $\geq$0)	0.045	0.014	0.016		0.022	
p(Both $\geq$0)	0.121	0.024	0.037		0.038	
Observations	11,469	11,469	11,469	11,469	11,469	11,469

Treatment Effects: DiD

	No Quality	Detailed Attributes			Simple Quality	
	(1) Price	(2) Price	(3) Price	(4) Quality	(5) Price	(6) Quality
Incentives × Year 2	-0.036	-0.052	-0.048	0.017	-0.040	0.022
	(0.049)	(0.041)	(0.043)	(0.025)	(0.044)	(0.032)
	[0.463]	[0.236]	[0.280]	[0.481]	[0.374]	[0.494]
Autonomy × Year 2	-0.111	-0.117	-0.108	-0.004	-0.116	0.023
	(0.048)	(0.044)	(0.044)	(0.024)	(0.046)	(0.029)
	[0.020]	[0.007]	[0.008]	[0.890]	[0.009]	[0.417]
Both × Year 2	-0.091	-0.111	-0.111	0.028	-0.095	0.051
	(0.051)	(0.043)	(0.044)	(0.028)	(0.047)	(0.033)
	[0.071]	[0.007]	[0.008]	[0.331]	[0.041]	[0.140]
Quality			0.688			
			(0.022)			
Item FEs	yes	yes	yes	yes	yes	yes
Item Attributes	no	yes	no		no	
Simple Quality	no	no	no		yes	
p(Incentives $\geq$0)	0.463	0.236	0.280		0.374	
p(Autonomy $\geq$0)	0.020	0.007	0.008		0.009	
p(Both $\geq$0)	0.071	0.007	0.008		0.041	
Observations	21,183	21,183	21,183	21,183	21,183	21,183

Open Questions

- We found that treatments reduce prices, leave quantity, quality and the composition of purchases unchanged
- Why is the effect of incentives so muted? Why don't incentives and autonomy leverage one another?
- What is the role of the supervisor?
- We now use a simple model to rationalise these findings and provide auxilliary predictions

Outline

A Model of Shifting Agency Problems

- Monitoring of rules creates a second set of agents - auditors, inspectors- who are also subject to an agency problem (Shleifer & Vishny 1993; Barron & Olken 2009)
- Whether rules are effective at ensuring efficient procurement depends on the relative strength of misalignment
  - more rules $\rightarrow$ more authority to the monitor $\rightarrow$ less corruption by the agent but the monitor can exploit it to personal advantage
- Choice of incentives and the allocation of authority needs to strike a *balance* between the two agency problems

Players and Actions

- Procurement purchases are made by an agent and monitored by a supervisor with probability r
- Agent (supervisor) choose markups x_a (x_s)
- "Mark-up" captures all sources of interest misalignment: bribes, effort, fastidiousness

Payoffs

- Agent's payoff:

$$V_a = u_a\left(x_a\right) - k_a\left(x_a, \theta_a, \lambda, b, r\right)$$

- Supervisor's payoff:

$$V_s = u_s\left(x_s\right) - k_s\left(x_a, x_s, \theta_s, r\right)$$

- Key Parameters:
  1. θ_a: Agent's alignment ("honesty")
  2. θ_s: Supervisor's alignment ("honesty")
  3. r: Supervisor's power (– agent's autonomy)
  4. b: Agent's bonus ("incentive")
  5. λ: Good's homogeneity

Payoffs

- Agent's payoff:

$$\begin{aligned} V_a &= u_a\left(x_a\right) - k_a\left(x_a, \theta_a, \lambda, b, r\right) \\ &= x_a - \frac{1}{2}\lambda\left(\theta_a + b + r\right) {x_a}^2 \end{aligned}$$

- Supervisor's payoff:

$$\begin{aligned} V_s &= u_s\left(x_s\right) - k_s\left(x_a, x_s, \theta_s, r\right) \\ &= \begin{cases} x_s - \frac{1}{2}\theta_s\left(x_a + x_s\right)^2 & \text{w/pr } r \\ 0 & \text{w/pr } 1 - r \end{cases} \end{aligned}$$

  - Key Parameters:

1. θ_a: Agent's alignment ("honesty")
2. θ_s: Supervisor's alignment ("honesty")
3. r: Supervisor's power (– agent's autonomy)
4. b: Agent's bonus ("incentive")
5. λ: Good's homogeneity

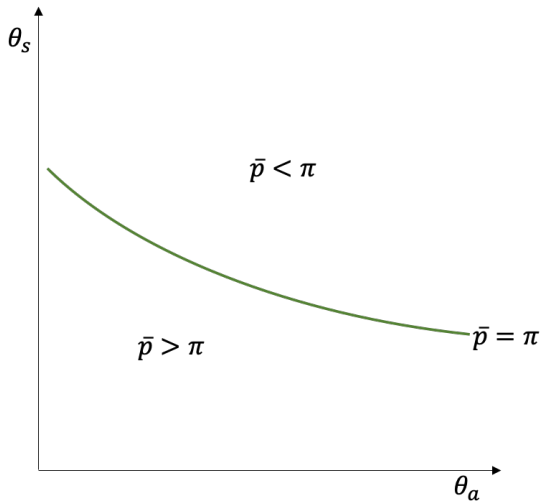
Equilibrium Markups and Prices

$$x_a^* = \frac{1}{\lambda\left(\theta_a + b + r\right)}$$

$$x_s^* = \frac{1}{\theta_s} - x_a^*$$

$$\bar{p} = \frac{r}{\theta_s} + \frac{1-r}{\lambda\left(\theta_a + b + r\right)}$$

$$\left(\bar{p} = x_a + r x_s\right)$$



Incentive Treatment: Increase in b

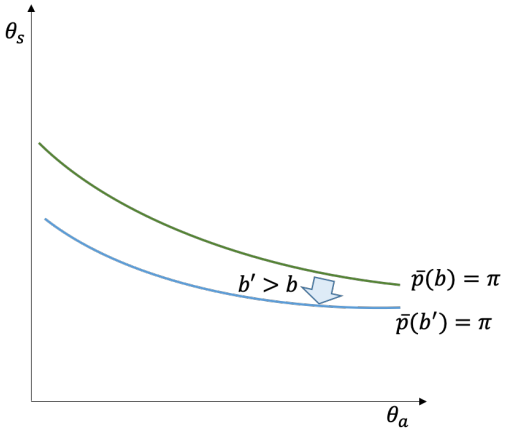
$$\bar{p} = \frac{r}{\theta_s} + \frac{1-r}{\lambda(\theta_a+b+r)}$$

Proposition

An increase in the agent's incentive reduces average price; the relative size of the reduction is decreasing in the supervisor's alignment.

Incentive Treatment: Increase in b

$$\bar{p} = \frac{r}{\theta_s} + \frac{1-r}{\lambda(\theta_a+b+r)}$$



Proposition

An increase in the agent's incentive reduces average price; the relative size of the reduction is decreasing in the supervisor's alignment.

Increasing b reduces $\bar{p}$

1. Agent less misaligned $\rightarrow$ decreases markup x_a
2. Supervisor increases markup x_s

- net effect is $\frac{d\bar{p}}{db} = -\frac{1}{\lambda}\frac{1-r}{(b+r+\theta_a)^2} < 0$

Autonomy Treatment: Decrease in r

Proposition

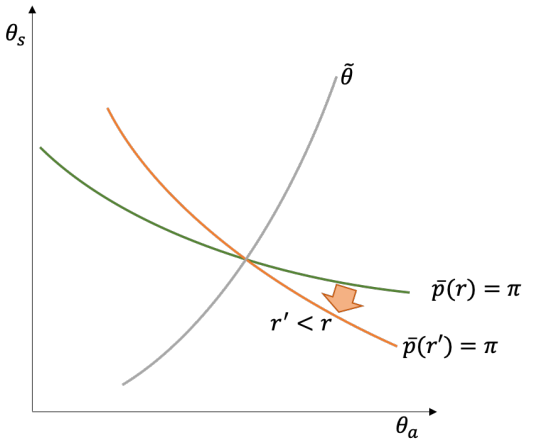
A decrease in supervisory power r *increases average price* $\bar{p}$ *if and only if the supervisor is sufficiently aligned* $\left(\theta_s > \tilde{\theta}_s > 0\right)$

Autonomy Treatment: Decrease in r

Proposition

A decrease in supervisory power r increases average price $\bar{p}$ if and only if the supervisor is sufficiently aligned $\left(\theta_s > \bar{\theta}_s > 0\right)$ Decreasing r has 2 effects:

1. Agent less supervised $\rightarrow$ increases markup x_a
2. Supervisor has less chance to impose her own markup x_s



Summary [ADD NEW PREDICTIONS]

- The effect of both treatments depends on the relative strength of the agency problem
  - The effect of **autonomy** is stronger when the supervisor is relatively **less aligned**
  - The effect of **incentives** is stronger when the supervisor is relatively **more aligned**
  - Test directly by finding a proxy of alignment?
- The effect of both treatments is stronger with less homogeneous goods

Outline

Outline

Measuring Alignment

- We do not observe AG type θ_s directly.
- But different AG in each district means we can use district-level proxies:
  - Share of transactions approved at the FYE (0-97%, median 39%)

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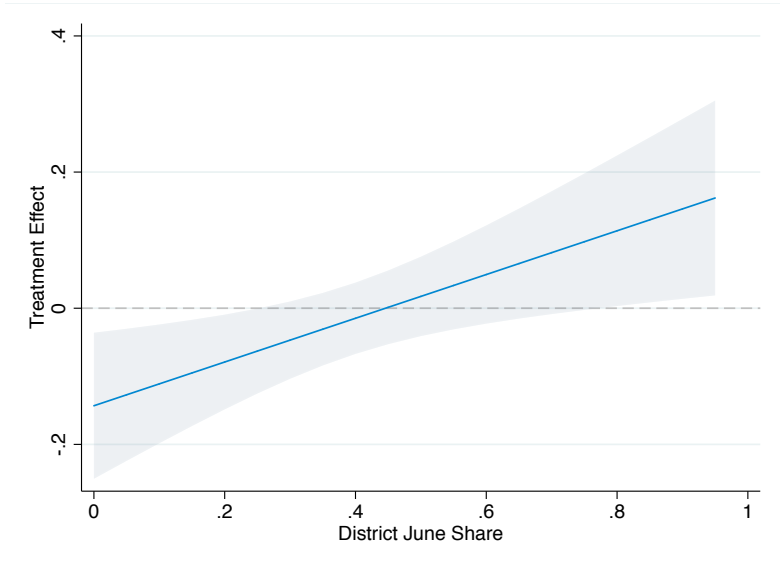
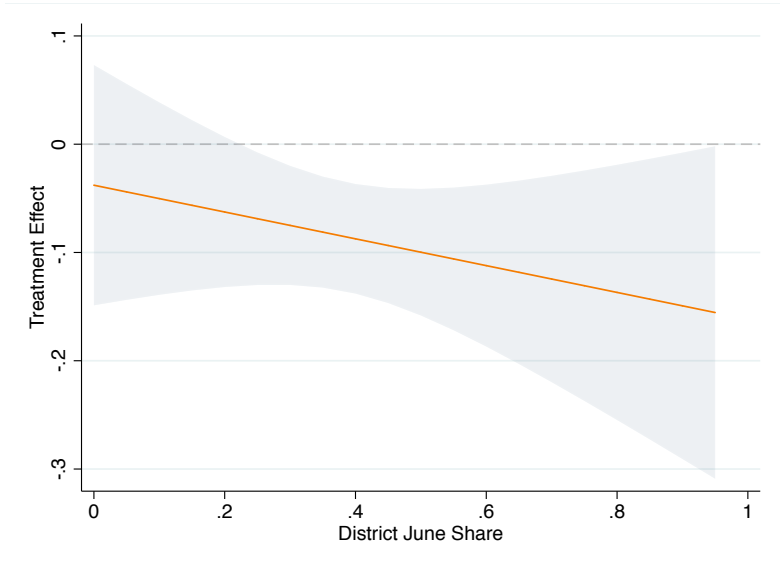
- Theory predicts that
  - Autonomy is more effective at reducing prices when θ_s is low
  - Incentives is more effective at reducing prices when θ_s is high

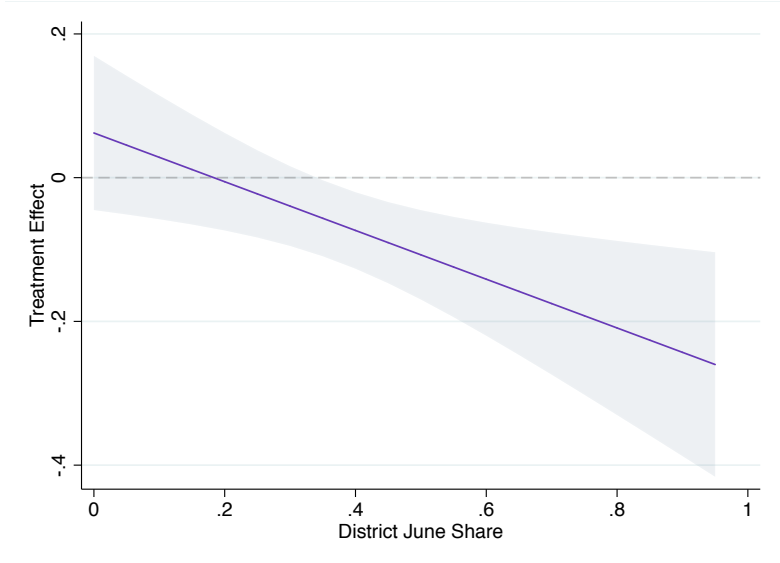
Incentives more effective at reducing prices when θ_s is high



Autonomy more effective at reducing prices when θ_s is low



Autonomy prevails in the combined effect



Heterogeneity by AG type

Table: Treatment Effect Heterogeneity by District

	(1)	(2)	(3)	(4)
Incentives	-0.121	-0.126**	-0.143**	-0.098
	(0.078)	(0.062)	(0.065)	(0.068)
Autonomy	-0.019	-0.065	-0.038	-0.013
	(0.083)	(0.067)	(0.067)	(0.074)
Both	0.107	-0.009	0.062	0.083
	(0.078)	(0.066)	(0.065)	(0.077)
Incentives × District June Share	0.279*	0.257*	0.321**	0.204
	(0.169)	(0.147)	(0.145)	(0.149)
Autonomy × District June Share	-0.187	-0.071	-0.124	-0.196
	(0.195)	(0.157)	(0.156)	(0.171)
Both × District June Share	-0.447**	-0.192	-0.339**	-0.430**
	(0.186)	(0.162)	(0.154)	(0.187)
Item Type Control	none	Attribs	Scalar	Coarse
Observations	11666	11666	11666	11666

Outline

Good Homogeneity

- When goods are less homogeneous, there is more naturally occurring price dispersion.

  $\Rightarrow$ greater scope to hide bribes in prices but also more scope to save.

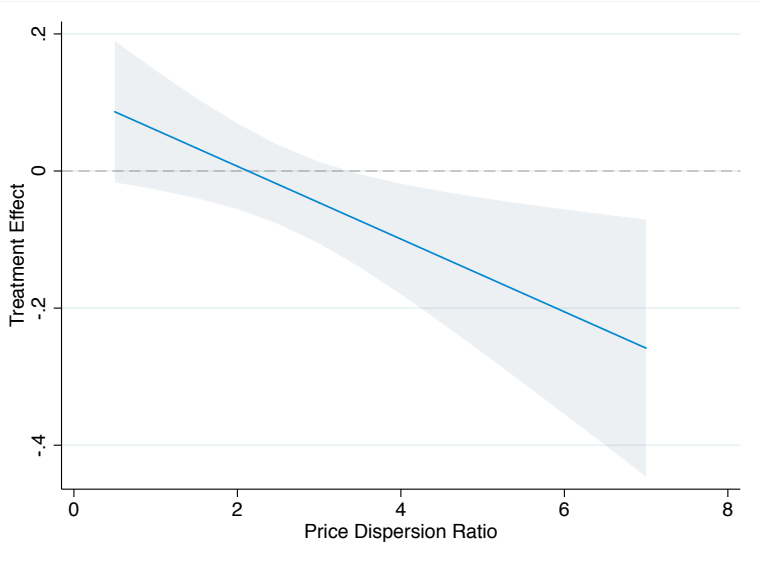
- Proxy for goods' heterogeneity with price dispersion ratio

$$\phi_g = \frac{\text{Var}_i\left(p_{ig}\right)}{\text{Var}_i\left(\hat{p}_{ig}\right)}$$

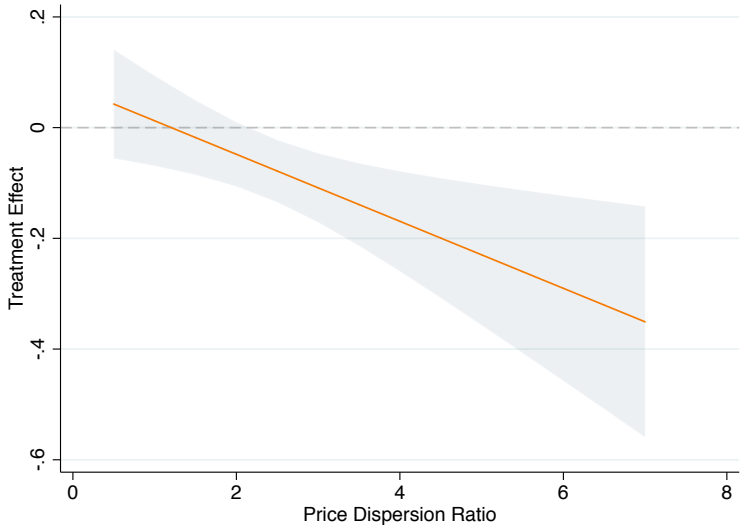
  where $\hat{p}_{ig}$ is prices predicted by attributes (as in scalar control)

- Theory predicts
  - Incentives more effective for less homogenous products
  - Autonomy more effective for less homogenous products

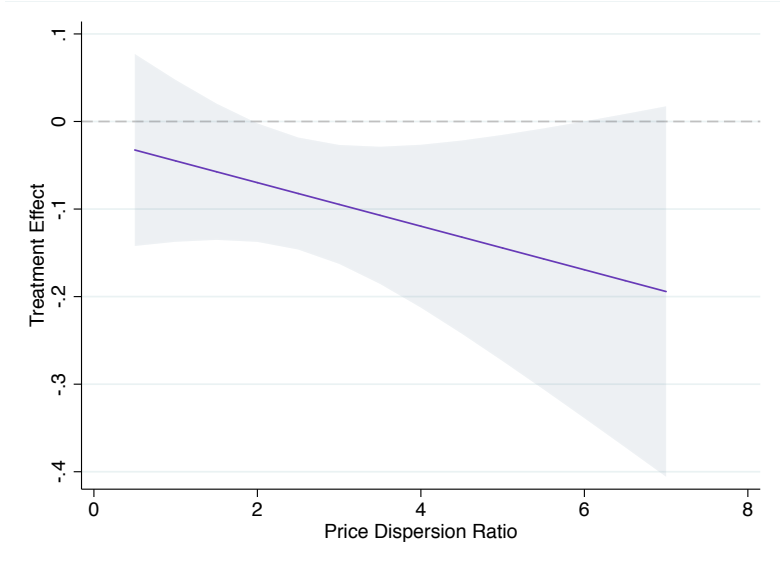
Incentives more effective when agents have discretion over prices



Autonomy more effective when agents have discretion over prices



and for the combined treatment



Heterogeneity by Good Homogeneity

Table: Treatment Effect Heterogeneity by Item

	(1)	(2)	(3)	(4)
Incentives	0.135	0.045	0.046	0.113
	(0.087)	(0.054)	(0.059)	(0.073)
Autonomy	0.075	0.049	0.039	0.073
	(0.084)	(0.060)	(0.063)	(0.071)
Both	0.013	-0.067	-0.074	-0.020
	(0.083)	(0.059)	(0.063)	(0.078)
Incentives $\times$ Price Dispersion Ratio	-0.060**	-0.029	-0.028	-0.053**
	(0.027)	(0.020)	(0.020)	(0.025)
Autonomy $\times$ Price Dispersion Ratio	-0.062**	-0.054**	-0.047*	-0.061**
	(0.029)	(0.023)	(0.024)	(0.026)
Both $\times$ Price Dispersion Ratio	-0.031	-0.007	0.001	-0.025
	(0.028)	(0.021)	(0.022)	(0.027)
Item Type Control	none	Attribs	Scalar	Coarse
Observations	11666	11666	11666	11666

Outline

Why Does the Autonomy Treatment Work?

- Supervision is a bad idea per se?
  - knowing that someone will second-guess my decisions makes me less motivated
  - solution: remove monitor altogether or turn it into an advisor?
- Supervision is fine – it's the second veto player?
  - requiring double approval for every purchase creates more corruption or inefficiency
  - solution: move from ex ante granular monitoring to ex post holistic monitoring?

Autonomy Treatment Bundle

- Autonomy treatment is a bundle of

1. Petty Cash
2. AG Checklist
3. Early Budget Releases

- Which one drives treatment?

1. Voluntary Takeup $\Rightarrow$ IV strategy
2. Endline recollection of Checklist
3. Endline perceived increase in timeliness of budget release

Petty Cash Takeup

	OLS				IV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Incentives	-0.023	-0.030	-0.030	-0.022	-0.020	-0.030	-0.026	-0.022
	(0.034)	(0.025)	(0.029)	(0.030)	(0.037)	(0.028)	(0.032)	(0.033)
Cash	-0.116***	-0.113***	-0.109***	-0.100***	-0.101**	-0.102***	-0.094**	-0.098**
	(0.041)	(0.028)	(0.031)	(0.036)	(0.049)	(0.036)	(0.038)	(0.043)
Cash & Incentives	-0.096**	-0.102***	-0.098***	-0.114***	-0.098*	-0.112***	-0.101**	-0.116**
	(0.048)	(0.033)	(0.037)	(0.043)	(0.058)	(0.043)	(0.046)	(0.053)
Item Type Control	none	Attribs	Scalar	Coarse	none	Attribs	Scalar	Coarse
Observations	11422	11422	11422	11422	11422	11422	11422	11422

Mediation Analysis of Bundled Treatment

	Baseline	Petty Cash		Early Budget		AG Checklist		All	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Assigned to Autonomy	-0.079**		0.017		-0.090**		-0.072*		0.007
	(0.035)		(0.050)		(0.042)		(0.040)		(0.056)
Autonomy × Received Petty Cash		-0.111***	-0.126**					-0.123***	-0.125**
		(0.038)	(0.058)					(0.040)	(0.056)
Autonomy × Budget Released Early				-0.006	0.040			0.045	0.044
				(0.030)	(0.043)			(0.045)	(0.045)
Autonomy × Received AG Checklist						-0.052	-0.018	-0.010	-0.010
						(0.046)	(0.055)	(0.050)	(0.053)
Assigned to Incentives	-0.028	-0.030	-0.029	0.022	-0.026	0.010	-0.030	-0.033	-0.028
	(0.036)	(0.032)	(0.036)	(0.031)	(0.036)	(0.031)	(0.036)	(0.033)	(0.036)
Assigned to Both	-0.091**		-0.005		-0.064		-0.070*		0.025
	(0.041)		(0.060)		(0.042)		(0.041)		(0.067)
Both × Received Petty Cash		-0.128***	-0.121*					-0.097**	-0.115*
		(0.045)	(0.070)					(0.045)	(0.069)
Both × Budget Released Early				-0.136	-0.115			-0.096	-0.101
				(0.084)	(0.091)			(0.085)	(0.085)
Both × Received AG Checklist						-0.081	-0.052	-0.023	-0.029
						(0.061)	(0.067)	(0.058)	(0.063)
Item Type Control	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse
Observations	10566	10566	10566	10566	10566	10566	10566	10566	10566

Outline

Conclusion

- Organizations often use rules and monitoring to deal with agency issues
  - Creates two sets of agents: implementing agents and monitoring agents.
  - Rules allocate authority between the two agents
  - Incentives to one agent offset by response of the other agent

Conclusion

- Organizations often use rules and monitoring to deal with agency issues
  - Creates two sets of agents: implementing agents and monitoring agents.
  - Rules allocate authority between the two agents
  - Incentives to one agent offset by response of the other agent
- Experimental results from procurement bureaucrats in Punjab, Pakistan show
  - Incentives to implementing agents largely offset by response of monitors
    - no effect on prices on average unless the monitor is well aligned
  - Shifting authority to implementing agents improves outcomes
    - prices go down on average, especially if the monitor is not aligned

Conclusion

- We show how tradeoff between rules and incentives depends on relative misalignment: Is implementing or monitoring agent more aligned with principal?
- Theory shows how we can use responses to changes in autonomy and incentives to back out nature of agency problem.

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- Theory shows how we can use responses to changes in autonomy and incentives to back out nature of agency problem.

- In our setting: bureaucratic performance improved by shifting authority to implementing agents. Little autonomy to respond to incentives.

- In general: Allocation of authority and incentives to different sets of agents hinges on precise nature of agency problems. Provide diagnostic tool

Long run effects

- distrust breeds distrust: *The only way to make a man trustworthy is to trust him; and the surest way to make him untrustworthy is to distrust him and show your distrust.* (Memorandum on the Effects of Atomic Bomb From: Henry Stimson, Secretary of War To: Harry S Truman, President of the Unites States of America Date: September 11, 1945)

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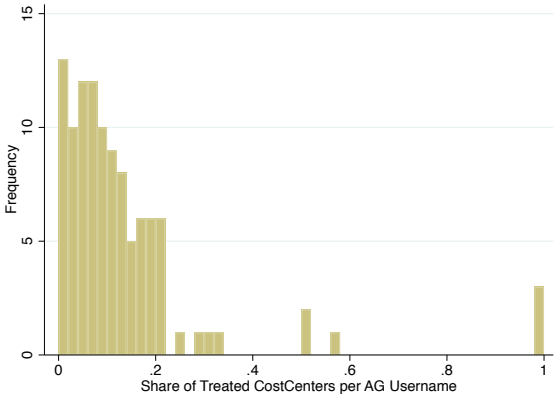
- autonomy might attract talent

Appendix Slides

SUTVA

1. treatment does not affect control POs e.g. through AG (sutva)
   - treated POs are a small fraction of total POs supervised



   - controlling or not for district FEs (each district has an AG) doesn't affect results

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Bad Control

2. quality not affected by treatment (bad control)

- Potential outcomes framework:
  - potential price outcomes $p(D,q)$, treatment $D \in \{0,1\}$, quality $q \in \{0,1\}$
  - potential quality outcomes $q(D)$
  - Experiment $\rightarrow$ unconfoundedness $\{p_i(D,q), q_i(D)\} \perp D_i | X_i$
- Bad control problem?:

$$\begin{aligned}
&\mathbb{E}[p|D=1,q=1] - \mathbb{E}[p|D=0,q=1] \\
&= \underbrace{\mathbb{E}[p(1,1)|q(1)=1] - \mathbb{E}[p(0,1)|q(1)=1]}_{\text{treatment effect on price}} \\
&\quad + \underbrace{\mathbb{E}[p(0,1)|q(1)=1] - \mathbb{E}(p(0,1)|q(0)=1)}_{\text{composition effect}\neq 0?}
\end{aligned}$$

- Results don't show treatment effect on quality
- Diff in Diff results the same

Back