Political Economy

Lecture 3: Collective action and diversity

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Differences in access to public goods

Country	Year	% population with access to											
		Clean water			Health facilities			Sanitation			Electricity		
		Overall	Highest region	Lowest region	Overall	Highest region	Lowest region	Overall	Highest region	Lowest region	Overall	Highest region	Lowest region
Brazil	2003	94.30	98.30	76.30				94.10	98.10	89.70	99.50	99.90	97.80
Bulgaria	2001												
China	1999	96.30	100.00	74.72		99.50	61.11						
Egypt	2002	91.30	99.80	72.10	3.80[a]	16.10	1.80	93.60	99.90	73.00	98.70	99.90	75.40
India*	2001	33.70	99.00	2.00	3.20	61.00	0.00				76.00	100.00	36.00
Indonesia	2002	55.20	72.20	21.50	76.90	97.10	49.90	75.00	100.00	43.70			
Kenya	2000	54.90	93.90	37.20	49.00	55.00	11.00						
Mexico	2002	87.45	97.77	67.06	50.84	79.77	22.70	72.31	96.80	38.47			
Nepal	2001	44.80	82.00	12.00	0.30[b]	2.24	0.00	43.72	93.25	11.18	32.15	97.38	5.89
Pakistan	1998												
Russia	2001												
South Africa	2001	72.80	90.50	50.50	66.10	79.00	49.70	90.80	98.70	70.90	71.70	88.10	46.80
Thailand	2001	98.90	99.80	97.10				98.90	100.00	96.60	98.30	99.90	97.20
Vietnam	2001				99.00	100.00	97.20				79.30	98.90	50.50

Source: Banerjee, Iyer, and Somanathan (2008)

- Large differences in availability of public goods across countries.
- Also across regions within the same country.
- Differences in:
  - Physical access to facilities;
  - Quality of public good provision.

- Why these differences?
  - **Differences in preferences**:
    Implausible that these large differences are explained by differences in preferences across communities (as most of them tend to value similar public goods in similar ways).
  - **Differences in resources**:
    At least in part, but differences remain large when taking available resources into account.
  - **Capacity to act collectively**:
    Crucial differences in the capacity of communities to act collectively so as to increase demand for the provision of public goods and improve monitoring of local officials in charge of their delivery.

Collective action and community characteristics

> *" [. . .] Unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, rational, self-interested individuals will not act to achieve their common or group interests."* *Olson (1965)*

- What community characteristics are likely to favor (hinder) collective action?
  - Group size: Collective action problems are more severe in larger groups.
  - Distribution of benefits within the group: collective action problems are more severe in groups in which most of the benefits from public goods are captured by a small number of members.
  - Other factors: Influence, cohesion, etc.

A toy model of collective action

- N individuals endowed with 1€.
- Each individual can contribute c_i to a public good.
- The public good technology is such that the sum of individuals contributions will be multiplied by K before the total quantity is equally divided between all individuals.
- How much do individuals contribute?
- What would be socially optimal?

- Each individual solves:

$$\max_{c_i} U_i = 1 - c_i + \frac{K}{N} \sum_{j=1}^{N} c_j,$$

which can be rewritten as:

$$\max_{c_i} U_i = 1 + (\frac{K}{N} - 1)c_i + \frac{K}{N} \sum_{j=1, j \neq i}^{N} c_j.$$

- Individual i's payoff is increasing or decreasing in c_i depending on $K \lessgtr N$. If N is large, contributions will be null.
- Social optimum is achieved if $c_i = 1$, $\forall i$.
- Mis-alignment of social and marginal benefits creates incentives not to contribute.

2. Canonical model of collective action
   - Setup of the model
   - Equilibrium
   - Adding crowding-out

Setup of the model

- A very simple model of collective action to illustrate the idea that the larger a group, the less it will be able to favor tis common interests.

Alberto Alesina, Reza Baqir and William Easterly , 1999. "Public Goods and Ethnic Divisions," The Quarterly Journal of Economics, MIT Press, vol. 114(4), pages 1243-1284, November.

- A group composed of N individuals.
- Each member i of the group can make effort e_i to help the group achieving a collective objective.
- Let $\mathbb{P}$ be the probability that the group succeeds:

$$\mathbb{P}\left(\sum_{i=1}^{N} e_i\right) = \left[\sum_{i=1}^{N} e_i\right]^{\alpha},$$

with $\alpha \in (0, 1)$.

- If the objective is achieved, each member of the group receives individual benefit b from the collective effort (b does not depend on N, i.e. there is no congestion).
- Each member's cost of effort is:

$$c(e_i) = e_i^{\beta},$$

with $\beta > 1$.

Optimal decision

- Member i solves:

$$\max_{e_i} b\mathbb{P}\left(\sum_{i=1}^{N} e_i\right) - c(e_i).$$

- First order condition:

$$\alpha b\left[\sum_{i=1}^{N} e_i\right]^{\alpha-1} = \beta e_i^{\beta-1}.$$

- Since, individuals are identical: $\forall i,\ e_i \equiv e$ at equilibrium.
- So:

$$\alpha b\,[Ne]^{\alpha-1} = \beta e^{\beta-1}$$

$$\Leftrightarrow e^* = \left[\alpha\frac{b}{\beta}\right]^{\frac{1}{\beta-\alpha}} N^{\frac{\alpha-1}{\beta-\alpha}}.$$

- Individual effort **decreases** with N.
- Total collective **increases** with N:

$$E^* = Ne^* = \left[\alpha\frac{b}{\beta}\right]^{\frac{1}{\beta-\alpha}} N^{\frac{\beta-1}{\beta-\alpha}}$$

Socially optimal effort

- Socially optimal efforts solve:

$$\max_{\forall i,\, e_i = e} Nb\mathbb{P}\left(\sum_{i=1}^{N} e_i\right) - \sum_{i=1}^{N} c(e_i).$$

- First order condition:

$$N\alpha b\left[Ne\right]^{\alpha-1} = \beta e^{\beta-1}$$

$$\Leftrightarrow \bar{e} = \left[\alpha\frac{b}{\beta}\right]^{\frac{1}{\beta-\alpha}} N^{\frac{\alpha}{\beta-\alpha}}.$$

- Individual effort **increases** with n.
- So does total collective effort:

$$\bar{E} = N\bar{e} = \left[\alpha\frac{b}{\beta}\right]^{\frac{1}{\beta-\alpha}} N^{\frac{\beta}{\beta-\alpha}}$$

- Let us compare E^* and $\bar{E}$.

$$\frac{E^*}{\bar{E}} = N^{\frac{-1}{\beta-\alpha}}.$$

- This ratio is lower than 1 and goes to 0 as N goes to infinity.
- The free-riding problem becomes more severe the larger the size of the group.
- Yet, total effort is increasing in N, such that larger groups still have more access to public goods in this model.

Adding crowding-out

- Assume the good is an impure public good, i.e. there is some private component in the return from the collective action (e.g. congestion, smaller stakes per capita for larger groups).
- Same setting as before (see slide 12, but individual benefit from the success of the collective success is now written as:

$$b + \frac{B}{N}.$$

- New first order condition :

$$\alpha \left(b + \frac{B}{N} \right) \left[\sum_{i=1}^{N} e_i \right]^{\alpha - 1} = \beta e_i^{\beta - 1}.$$

- Optimal individual effort (still decreasing in N):

$$e^* = \left[\left(b + \frac{B}{N}\right)\frac{\alpha}{\beta}\right]^{\frac{1}{\beta-\alpha}} N^{\frac{\alpha-1}{\beta-\alpha}}.$$

- Total effort:

$$E^* = Ne^* = \left[\left(b + \frac{B}{N}\right)\frac{\alpha}{\beta}\right]^{\frac{1}{\beta-\alpha}} N^{\frac{\beta-1}{\beta-\alpha}}$$

- E^* can be either decreasing or increasing in N depending on parameters' values (e.g., it is decreasing if $b = 0$ and $\beta < 2$).
- Idea: The free-riding issue is more severe if less (per capita) efforts are needed to reach the same total effort.

3. Collective action and heterogeneity
   - Heterogeneity
   - Collective action across groups
   - Collective action across groups with different tastes

Heterogeneity

- How might heterogeneity play a role in collective action?
  - The society might be composed of different groups of different sizes that might benefit from different shares of the public good.
  - Groups are made of individuals who share traits but also differ in some dimension. Within-group heterogeneity might hinder coordination.

Collective action across groups

- Let us introduce the idea that individuals coordinate within groups and that groups compete over access to the public good.
- Assume there are G groups (indexed by $j = 1, \ldots, G$) of identical size n, such that $G \times n = N$.
- Assume that the public good as a pure public component b and a private component w that can be captured by one of the groups.
- Conditional on the public good to be produced, the probability that group j captures its private component is:

$$\mathbb{P}_j = \left(\sum_{i \in j} e_i \right) \Big/ \left(\sum_{j=1}^{G} \sum_{i \in j} e_i \right).$$

- Individual's $i \in j$ solves:

$$\max_{e_i} \left[b + w\mathbb{P}_j \right] \mathbb{P} \left(\sum_{i=1}^{N} e_i \right) - c(e_i).$$

- After some algebra, we get the following equilibrium condition for total collective effort E:

$$\alpha b + w - (1-\alpha)\frac{w}{G} = \beta \left(\frac{E}{n} \right)^{\beta-1} E^{1-\alpha}.$$

- Keeping n fixed, increasing G increases heterogeneity (number of groups).
- Here, increasing heterogeneity increases total collective effort.

- In this model, groups are competing with one another to capture the good, and the smaller each group is, the more each individual has an incentive to work hard.
- Here, group size matters only because your incentive to make efforts depends in part on what is happening in your group and bigger groups discourage effort. So having smaller groups increases effort. Making groups smaller reduces the collective action problem for that group; on aggregate many smaller groups do better than few larger groups.
- In order to capture the intuition that heterogeneity hurts, we need to look for a context where the free-rider problem is not the big problem. Instead, let us look at a context where the problem is heterogeneity in tastes

Collective action across groups with different tastes

- Let us assume that citizens vote both on the **size** and the **type** of a public good.
- Citizen i utility is given by:

$$U_i = g^{\alpha}(1 - d_i) + y - t,$$

with $0 < \alpha < 1$, g the size of the public good, d_i the distance between individual i's most preferred public good and the actual type of public good, y is income, and t is a lump-sum tax used to finance the public good which is produced through $g = Nt$, where (N is the size of the population, normalized to 1).

- Open agenda:
  1. Vote on the size of the public good, i.e. on t and g.
  2. Vote on the type of the public good.

Optimal decisions

- Voter i solves:

$$\max_{g} g^{\alpha}(1-\hat{d}_i)+y-g,$$

where $\hat{d}_i$ is the distance of individual i from the the type of public good favored by the median voter (to be chosen next).

- Voter i's bliss point is:

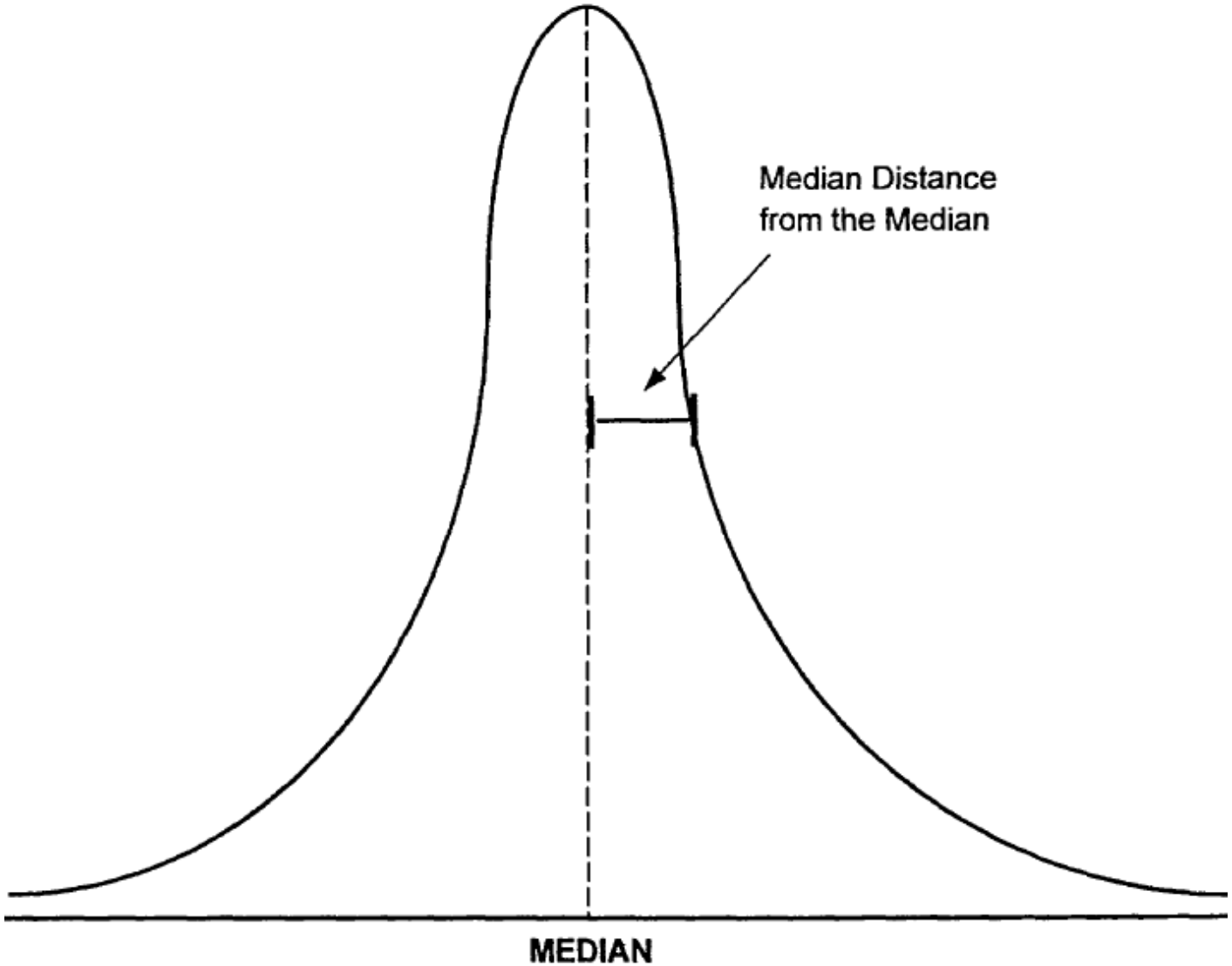
$$g_i^* = \left[\alpha(1-\hat{d}_i)\right]^{\frac{1}{1-\alpha}}.$$

- Using the median voter theorem, the voted quantity of public good is given by:

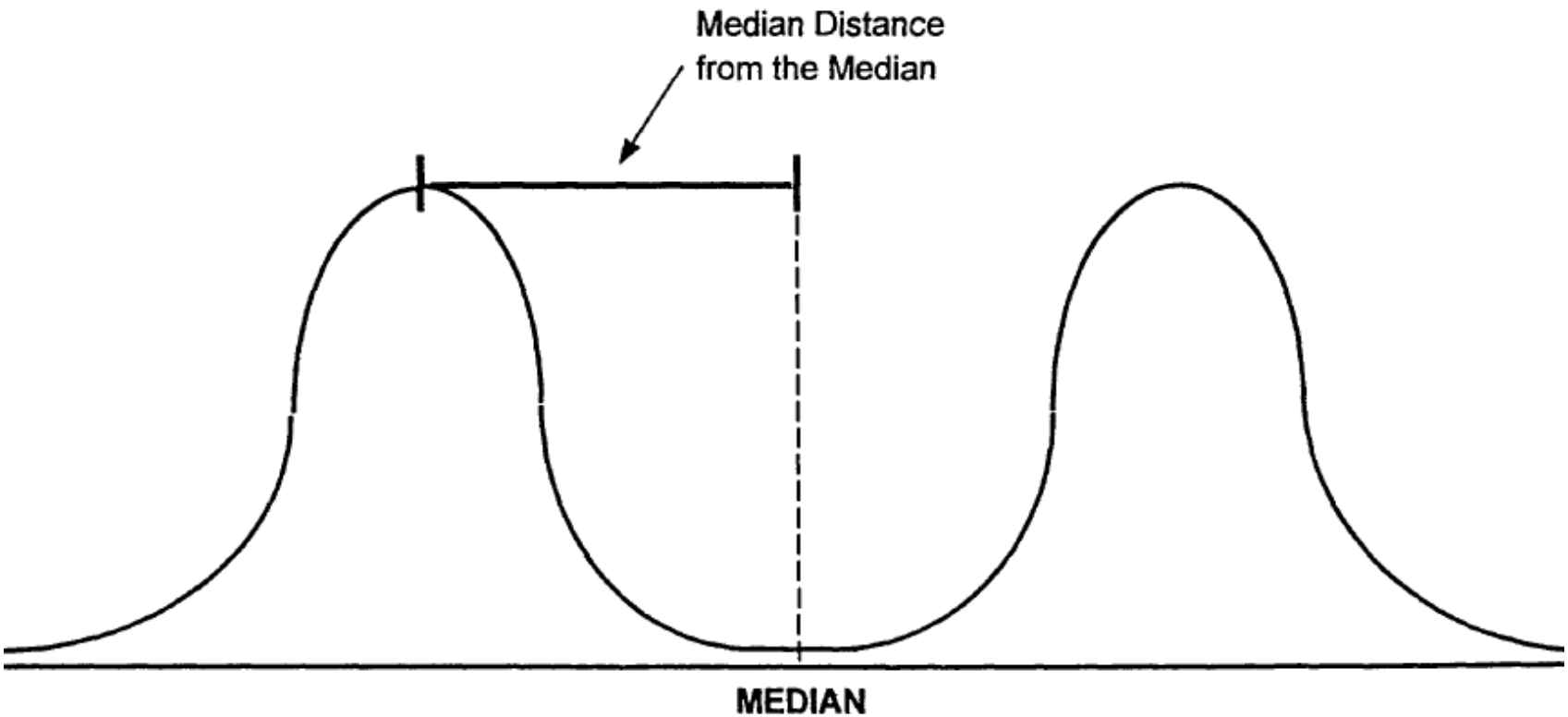
$$g^* = \left[\alpha(1 - \hat{d_i^m})\right]^{\frac{1}{1-\alpha}},$$

where $\hat{d_i^m}$ is the median distance from the median voter most preferred type of public good, a.k.a. the **median distance from the median**.

- Equilibrium amount of the public good is decreasing in $\hat{d_i^m}$.
- Polarization increases this distance.



Source: Alesina, Baqir, and Easterly (1999)



Source: Alesina, Baqir, and Easterly (1999)

4 Empirical evidence
- The empirics of diversity
- Heterogeneity and the design of jurisdictions
- Ethnic diversity and public goods

- Theoretical models indicate (i) that larger groups have more difficulty to coordinate (free-riding problem) and (ii) that diversity shapes policies. In particular, heterogeneity impose coordination costs and implies differences in preferences.
- Empirical evidence on policies or outcomes:
  1. Design of (political) jurisdictions.
  2. Voluntary contributions.

- How to measure heterogeneity/diversity?
- Probability that two randomly drawn individuals will be from different two different groups.
- Let s_j be the share of total population of some area that belongs to group j.
- Heterogeneity in a given area is:

$$h = 1 - \sum_{j=1}^{G} (s_j)^2.$$

- Groups can be races, ethnic group, nationalities, same-language groups, income groups, etc. or any combination of these criteria (depending on the question we are interested in).

Heterogeneity and the design of jurisdictions

Alberto Alesina, Reza Baqir, and Caroline Hoxby, 2004. "Political Jurisdictions in Heterogeneous Communities," Journal of Political Economy, The University of Chicago Press, vol. 112(2), pages 348-396, April.

- Jurisdictions are designed in response to the trade-off between benefits of a larger scale and costs of a more heterogeneous population.
- The **number of school districts** (of smaller their size) in a county should be **increasing in heterogeneity** (disutility of sharing the same public good with other groups and/or differences in ideologies or tastes).
- Empirical strategy:

$$\#\text{school districts}_i = \alpha + \beta \text{Heterogeneity}_i + \ldots$$

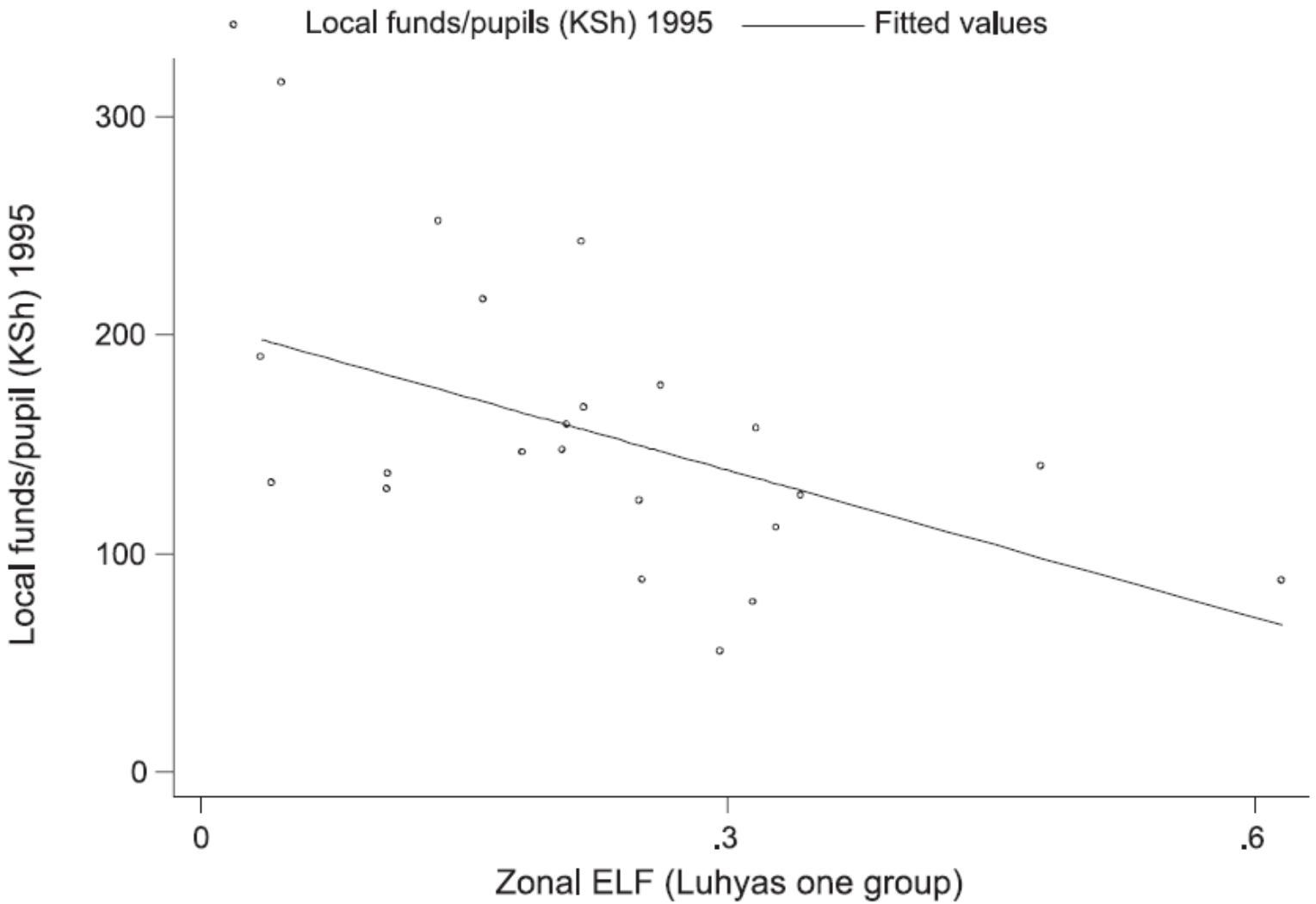
  - Also using changes across time and shocks to racial heterogeneity generated by the two world wars.

- Results:
  - Strong evidence that racial heterogeneity shapes jurisdictions.
  - Evidence that income heterogeneity shapes jurisdictions.
  - Little evidence that ethnic heterogeneity shapes jurisdictions.

Ethnic diversity and public goods

Edward Miguel and Mary Kay Gugerty, 2005. "Ethnic diversity, social sanctions, and public goods in Kenya," Journal of Public Economics, Elsevier, vol. 89(11-12), pages 2325-2368, December.

- School funding in rural Kenya.
- Theoretical approach:
  - Assume no preference heterogeneity over types of public goods.
  - Focus on voluntary contribution to finance public goods (no compulsory taxes).
  - Stress the role of social sanctions in sustaining public goods provision.
  - No ability to impose effective sanctions outside own ethnic group.
  - Predict that ethnic diversity undermines contributions to public goods.
- Simple cross-section estimation.



Local funds per pupil and local ethnolinguistic fractionalization.
Source: Miguel and Gugerty (2005)

- Comment:
  - The theoretical framework we just sketched suggests that informal sanction are important to make sure individuals act cooperatively and in the direction that benefits to all.
  - Broader idea: Social capital is an important determinant of collective action.
  - Strength of social links, interpersonal trust, civic capital, etc.

5 Collective monitoring of officials
- Theoretical background
- Empirical evidence

Theoretical background

- A manifestation of collective action failure might be insufficient or bad monitoring of officials (agents) by citizens (principals).
- An appealing simple solution to this problem is to increase the ability of citizens to monitor local officials.

> *"Putting poor people at the center of service provision: enabling them to monitor and discipline service providers, amplifying their voice in policymaking, and strengthening the incentives for service providers to serve the poor."* *World Development Report (2004)*

A simple model of monitoring

- Assume there is moral hazard:
  - Officials can exert some effort $e \in [0, 1]$ to produce a good.
  - They face a convex cost of effort $\frac{1}{2}ce^2$, with $c > 0$.
  - Effort is not observed by citizens.
  - The good is produced with probability e.
  - If it is produced, each citizen gets utility $\frac{1}{N}$, 0 otherwise.
- Monitoring:
  - One citizen is designated as monitor.
  - She needs to pay a (personal) cost $\frac{1}{2}\alpha m^2$ to observe with probability m whether the good was produced or not.
  - If she observes that the good was not produced, she can decide to pay a cost s to share the information with others. In that case, officials will suffer a punishment p.
- Timing: (1) The monitor announces her monitoring plan m; (ii) officials choose their effort e; (iii) payoffs are realized.

Optimal decisions

- Officials solve:

$$\max_e -p(1-e)m - \frac{1}{2}ce^2,$$

which yields:

$$e^* = \frac{pm}{c}.$$

- Officials' effort is obviously increasing in the probability to be caught shrinking and in the expected punishement.

- The monitor solves:

$$\max_m e^* \frac{1}{N} - \frac{1}{2}\alpha m^2 - ms(1 - e^*),$$

which yields:

$$m^* = \frac{p - csN}{Nc\alpha - 2psN}.$$

- So, at equilibrium:

$$e^* = \frac{p}{c}\frac{p - csN}{Nc\alpha - 2psN}.$$

- Reducing the cost of monitoring (α) increases monitoring and effort. Reducing the cost of sharing information (s) increases monitoring and effort. Increasing N lowers monitoring and effort (free rider problem).

Empirical evidence

- Two randomized experiments that sought to increase community-based monitoring of service providers in three different settings.
- Two different sets of results:
  1. Education in India: No impact.
  2. Health in Uganda: Massive impact.

Education in India

Abhijit V. Banerjee, Rukmini Banerji, Esther Duflo, Rachel Glennerster, and Stuti Khemani, 2010. "Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India," American Economic Journal: Economic Policy, American Economic Association, vol. 2(1), pages 1-30, February.

- Education in Uttar Pradesh, India.
- Substantial problems with teacher absence and teacher laziness. 39% of children age 7-14 could not read, nor understand, a simple story.
- Each school has a Village Education Committee (VEC):
  - Three parents, the head teacher, and the head of village.
  - Supposed to mediate between village government and bureaucracy, monitoring performance of schools, and controlling some share of the school budget.
  - But VECs are generally ineffective: Most parents did not know the VEC existed. Many VEC members did not know their responsibilities.

Interventions

1. Monitoring
   - Facilitated small group discussions in each hamlet of the village to talk about education.
   - Facilitated village-wide meeting to talk about education, providing details about the VEC and the role of it plays. Meeting included villagers, teachers, and village officials.
   - Facilitators followed up by visiting each VEC member, gave them a pamphlet on VEC roles and responsibilities, and discussed VEC with them.
2. Monitoring + information
   - Villagers taught how to test kids reading levels.
3. Monitoring + information + remediation
   - Village volunteers given 4 trainings in how to teach kids to read and visited about 7 times per year by a NGO to support their activity.

Experimental design

- 280 villages randomly allocated into 4 groups (65 in each treatment group and 85 in control group).
- Estimation:

$$y_i = \alpha + \beta_1 T_1 + \beta_2 T_2 + \beta_3 T_3 + \dots$$

- Outcomes:
  Knowledge by VEC members, awareness of parents, teacher effort, schooling status, school attendance, performance at tests, etc.

Results

- Results:
  - VEC members know more about their responsibilities.
  - Parents know more about schooling.
  - But parents and VEC members are not more involved.
  - No improvement in teachers' effort, not improvement in schooling outcomes.
  - However, in the third treatment group, youth volunteered to help children and children improved their reading skills.
- Comments:
  - Information alone does not guarantee activism (too pessimistic parents? lack of direct incentives?).
  - Villagers might face constraints in influencing public officials.

Health in Uganda

Martina Björkman and Jakob Svensson, 2009. "Power to the People: Evidence from a Randomized Field Experiment on Community-Based Monitoring in Uganda," The Quarterly Journal of Economics, vol. 124(2), pages 735-769.

- Health centers ("dispensaries") in rural Uganda. Each dispensary provides preventive care, outpatient care, maternity, laboratory services to a population of about $2,500$ households.
- Many problems: stock-out rate of 50% for basic drugs, only 41% use any equipment at all during examinations, etc.
- Health Unit Management Committee:
  - Health workers and non-political representatives of community.
  - Supposed to monitor but does not have hiring/firing power.

Intervention

- Treatment:
  - Conduct survey of health problems and quality of services.
  - Create facility-specific report card of service delivery, including comparison to other facilities.
  - Facilitate communication:
    - Within the community. Two-day event, including about 150 people. Discussed patient's rights, how to improve service delivery, etc. Culminated in "action plan" of improvements.
    - Within health providers. One-afternoon with all staff. Discussed report card findings.
    - Collective writing of a "community contract", which included promised changes in service and a plan for community monitoring.
- Two goals:
  - Increasing information about health problems and service delivery failures;
  - Strengthening monitoring by citizens.

Experimental design

- 50 dispensaries randomly allocated into 2 groups (25 in each).
- Estimation:

$$y_i = \alpha + \beta_1 T + \dots$$

- Outcomes:
  Community involvement in monitoring, efforts by health workers, health outcomes.

Results

Dependent variable	Suggestion box	Numbered waiting cards	Poster informing free services	Poster on patients' rights	Discuss facility in LC meetings	Received information about HUMC
Specification:	(1)	(2)	(3)	(4)	(6)	(7)
Program impact	0.32***	0.16*	0.27***	0.14	0.13***	0.04***
	(0.08)	(0.09)	(0.09)	(0.10)	(0.03)	(0.01)
Mean control group	0	0.04	0.12	0.12	0.33	0.08
Observations	50	50	50	50	3,119	4,996

Program impact on monitoring and information.
Source: Björkman and Svensson (2009)

Spec.	Dep. variable	Model	Program impact	2005	Mean control group 2005	Obs.
(1)	Equipment used	DD	0.08**	−0.07***	0.41	5,280
			(0.03)	(0.02)		
(2)	Equipment used	OLS	0.01		0.41	2,758
			(0.02)			
(3)	Waiting time	DD	−12.3*	−12.4**	131	6,602
			(7.1)	(5.2)		
(4)	Waiting time	OLS	−5.16		131	3,426
			(5.51)			
(5)	Absence rate	OLS	−0.13**		0.47	46
			(0.06)			
(6)	Management of clinic	OLS	1.20***		−0.49	50
			(0.33)			
(7)	Health information	OLS	0.07***		0.32	4,996
			(0.02)			
(8)	Importance of family planning	OLS	0.06***		0.31	4,996
			(0.02)			
(9)	Stockouts	OLS	−0.15**		0.50	42
			(0.07)			

Program impact on treatment practices and management.
Source: Björkman and Svensson (2009)

Dependent variable	Births	Pregnancies	U5MR	Child death
Specification:	(1)	(2)	(3)	(4)
Program impact	−0.016	−0.03**	−49.9*	
	(0.013)	(0.014)	(26.9)	
Program impact × year of birth 2005				−0.026**
				(0.013)
Program impact × year of birth 2004				−0.019**
				(0.008)
Program impact × year of birth 2003				0.003
				(0.009)
Program impact × year of birth 2002				0.000
				(0.006)
Program impact × year of birth 2001				0.002
				(0.006)
Mean control group 2005	0.21	0.29	144	0.029
Observations	4,996	4,996	50	5,094

Program impact on health outcomes.
Source: Björkman and Svensson (2009)

6 Conclusion

Conclusion

- The **free-rider problem** suggests that as group size increases, per-capita contributions decrease, and can be far below the social optimum.
- Although the impact on total provision with respect to N is theoretically ambiguous, this can lead to under-provision of public goods. This could be solve through social sanctions.
- However, social sanction can might have only limited effects in **heterogeneous** societies, i.e. in societies where individuals have different tastes and/or want to avoid each other.
- Monitoring officials in charge of public good is by itself a "pubic good". Here information and awareness of issues are key, but might still not be sufficient.

End of lecture.

Lectures of this course are inspired from those taught by
D. Acemoglu, Y. Algan, R. Durante, and B. Olken.