Economics 270B

Graduate Development Economics

Professor Fred Finan

April 6, 2015

Lecture 5 outline

- Overview of the literature on democracy and development
  Acemolgu et al (2014)
- Virtues of democracies: Political accountability
  Ferraz and Finan (2007)
- Virtues of democracies: Legitimacy
  Dal Bo, Foster, and Putterman (2011)
- Virtues of democracies: CDD
  Casey, Glennerster, and Miguel (2011)

Measuring democracy

Democracy is … "the institutional arrangement for arriving at political decisions in which individuals acquire the power to decide by means of a competitive struggle for the people's vote"
Schumpeter 1942

In practice, democracy is associated with a particular set of institutions

- free and fair elections
- accountability of politicians to the electorate
- free entry into politics

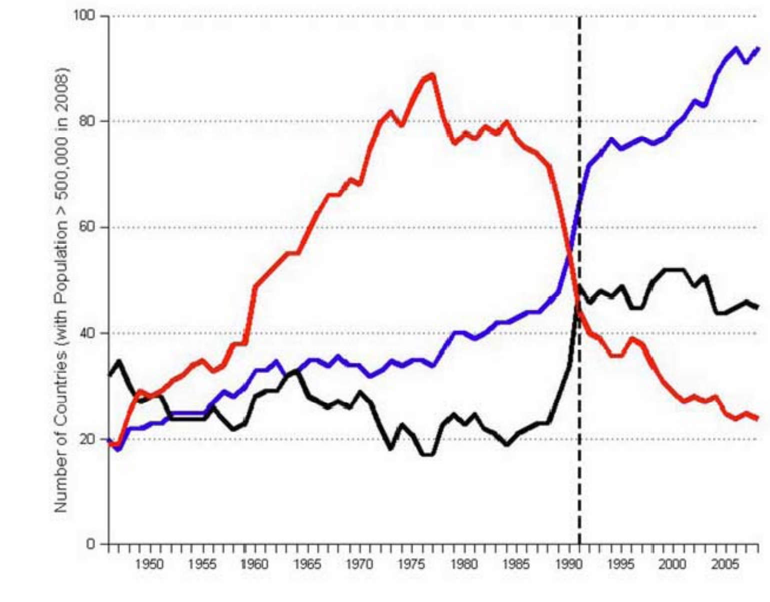
Countries differ as to the extent to which these institutional distinctions are satisfy...so how do we quantify the extent of "democracy"?

Measuring democracy

Two main measures are used to quantify democracy

- Freedom House political rights index
  - 1 to 7 (1 most freedom)
  - checklist of questions on: electoral process, political participation, functioning of government
- Polity's democracy index
  - 0 to 10 (10 most freedom)
  - checklist of questions on: competitiveness of political participation, competitiveness of executive recruitment, constraints on chief executive
  - provide information for all countries since independence starting in 1800

Democracies in the world



Democracy and development

- While we care about democracy for its own sake, we are also interested in understanding whether it impacts economic development?

Democracy and development

- While we care about democracy for its own sake, we are also interested in understanding whether it impacts economic development?

- The literature has focused on several potential channels:
- Political stability
  - Peaceful and predictable transfers of political power
  - Discourages extremism and illegitimate take-over of power
  - Lower degree uncertainty can foster investment and growth
- Distortions
  - Higher levels of income redistribution and inefficient policies (bigger government)
  - But do erect less entry barriers to maintain monopoly positions
  - Depends which of these two types of distortions is more costly for economic activity

Democracy and development

- Human capital
  - Different political regimes aggregate preferences differently $\rightarrow$ different social policies
  - If democracies promote more human capital accumulation $\rightarrow$ lead to more growth
- Other channels
  - Income inequality
  - Trade openness
  - Physical capital accumulation
  - Political selection and accountability

What say the empirical literature?

One-party nondemocracy certainly has its drawbacks. But when it is led by a reasonably enlightened group of people, as China is today, it can also have great advantages. That one party can just impose the politically difficult but critically important policies needed to move a society forward in the 21st century. (Tom Friedman, NYT)

What say the empirical literature?

One-party nondemocracy certainly has its drawbacks. But when it is led by a reasonably enlightened group of people, as China is today, it can also have great advantages. That one party can just impose the politically difficult but critically important policies needed to move a society forward in the 21st century. (Tom Friedman, NYT)

More political rights do not have an effect on growth... The first lesson is that democracy is not the key to economic growth (Barro 1997, pp. 1 and 11).

What say the empirical literature?

One-party nondemocracy certainly has its drawbacks. But when it is led by a reasonably enlightened group of people, as China is today, it can also have great advantages. That one party can just impose the politically difficult but critically important policies needed to move a society forward in the 21st century. (Tom Friedman, NYT)

More political rights do not have an effect on growth... The first lesson is that democracy is not the key to economic growth (Barro 1997, pp. 1 and 11).

the net effect of democracy on growth performance cross-nationally over the last five decades is negative or null (Gerring et al. (2005))

Empirical Challenges

What are the empirical challenges of estimating the effects of democracy on economic growth?

Empirical Challenges

What are the empirical challenges of estimating the effects of democracy on economic growth?

- Measurement Error (Attenuation Bias)
- Causality
- Dynamics

Dynamics

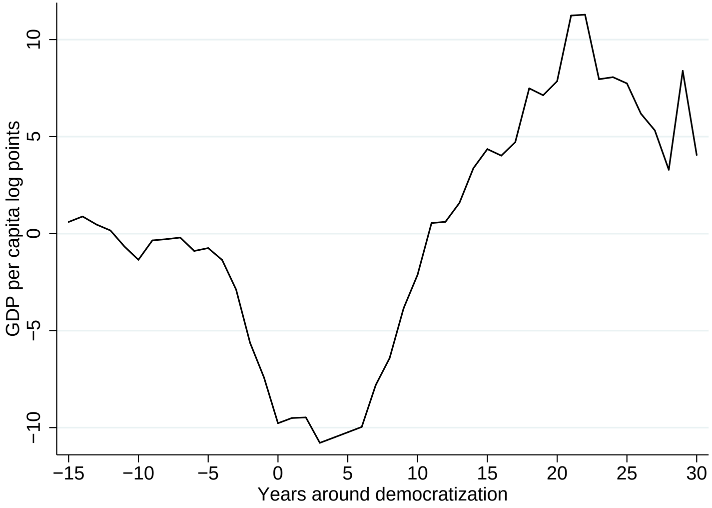


Figure: GDP per capita (in logs, from World Bank, in constant 2005 dollars) around a democratic transition, relative to other nondemocracies.

Acemoglu et al (2014)

Challenge this consensus belief that democracy doesn't matter.
Innovations:

- New measure of democracy - develop a dichotomous index of democracy purged of spurious changes in democracy scores
- Allow for and estimate serially correlated dynamics in (log) GDP
  - Control lags of GDP
  - Semi-parametric time series estimators
- IV - regional waves of democratization and reversals

Data

- Annual panel comprising of 175 countries from 1960 to 2010
- Index of democracy is a dichotomous measure following the work of Papaioannou and Siourounis (2008)
  - Combines information from Freedom House and Polity IV (only codes the country as democratic when all sources agree)
  - Validates coding with work done by Cheibub, Ghandi, and Vreeland (2010) and Boix, Miller, Rosato (2012)
- Main dependent variable: GDP per capita (2000 constant dollars)

Baseline Regression

$$y_{ct} = \beta D_{ct} + \sum_{j=1}^{p} \gamma_j y_{ct-j} + \alpha_c + \delta_t + \epsilon_{ct}$$

- y_{ct} - log of GDP per capita in country c at time t
- α_c - country fixed-effects
- δ_t - time fixed-effects
- p - lags of the log GDP per capita
- Long run effects over time: $\frac{\hat{\beta}}{1-\sum \hat{\gamma}_j}$

Baseline Results

Table: The dependent variable is the log of GDP per capita.

	(1)	(2)	(3)	(4)	(5)
Democracy	-10.112	0.973	0.651	0.787	0.887
	(4.316)	(0.294)	(0.248)	(0.226)	(0.245)
log GDP first lag		0.973	1.266	1.238	1.233
		(0.006)	(0.038)	(0.038)	(0.039)
log GDP second lag			-0.300	-0.207	-0.214
			(0.037)	(0.046)	(0.043)
log GDP third lag				-0.026	-0.021
				(0.028)	(0.028)
log GDP fourth lag				-0.043	-0.039
				(0.017)	(0.034)
$p-$value remaining lags					[0.565]
Long-run effect of democracy		35.59	19.60	21.24	22.01
$p-$ value long-run effect		[0.011]	[0.023]	[0.003]	[0.004]
Persistence of GDP		0.973	0.967	0.963	0.960
Unit root test adjusted $t-$stat		-4.791	-3.892	-4.127	-6.991
p-value (rejects unit root)		[0.000]	[0.000]	[0.000]	[0.000]
Observations	6,934	6,790	6,642	6,336	5,688
Countries	175	175	175	175	175

Nickell Bias

- Arises when estimating panel data models with fixed effects and lagged dependent variables
- We do the within transformation to get rid of the unobserved heterogeneity, we get

$$y_{ct} - \frac{1}{T_c}\sum_s y_{cs} = \beta\left(D_{ct} - \frac{1}{T_c}\sum_s D_{cs}\right)$$
$$+\sum_{j=1}^{p}\gamma_j\left(y_{ct-j} - \frac{1}{T_c}\sum_s y_{cs-j}\right) + \delta_t + \left(\epsilon_{ct} - \frac{1}{T_c}\sum_s \epsilon_{cs}\right)$$

- Bias is of the order $1/T$

Solutions

- Suppose that ϵ_{ct} is serially uncorrelated, then

$$E[(\epsilon_{ct} - \epsilon_{ct-1})(y_{cs}, D_{cs+1})'] = 0 \forall s \leq t - 2$$

- We can use previous lag of the dependent variable as instruments in GMM estimator
- We can also test the hypothesis that there is no serial correlation

Solutions

- Suppose that ϵ_{ct} is serially uncorrelated, then

$$E[(\epsilon_{ct} - \epsilon_{ct-1})(y_{cs}, D_{cs+1})'] = 0 \forall s \leq t-2$$

- We can use previous lag of the dependent variable as instruments in GMM estimator
- We can also test the hypothesis that there is no serial correlation

- Hahn, Hausman and Kuersteiner's (2002) minimum distance estimator. Removes asymptotic bias due to large number of moments.
- Impose different levels for the persistence of GDP from .95 to 1 (also removes unit roots if present).

Robustness

Table: The dependent variable is the log of GDP per capita.

	Base	ABOND	HHK	Imposing persistence of GDP process At 0.96	At 0.97	At 0.98	At 0.99
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Democracy	0.787	0.875	1.181	0.752	0.867	0.982	1.097
	(0.226)	(0.374)	(0.355)	(0.228)	(0.218)	(0.216)	(0.223)
Long-run effect of democracy	21.24	16.45	24.51	13.28	17.32	22.32	28.56
$p-$ value long-run effect	[0.003]	[0.051]	[0.005]	[0.001]	[0.000]	[0.000]	[0.000]
Persistence of GDP	0.963	0.947	0.952	0.960	0.970	0.980	0.990
Observations	6,636	6,161	6,161	6,636	6,636	6,636	6,636
Countries	175	175	175	175	175	175	175

Semi-parametric Control Strategies

- Let $\Delta y_{ct}^{j}(d)$ - potential change in GDP per capita at time $t+j$ of a country with $\Delta D_{ct} = d$
- Effect of democratization j periods after it occurs on the change in GDP per capita

$$\beta^{j} = E[\Delta y_{ct}^{j}(1) - \Delta y_{ct}^{j}(0)]$$

- CIA assumption

$$\Delta y_{ct}^{j}(d) \perp \Delta D_{ct} | D_{ct-1}, y_{ct-1}, y_{ct-2}, y_{ct-3}, y_{ct-4}, \forall c, t, j$$

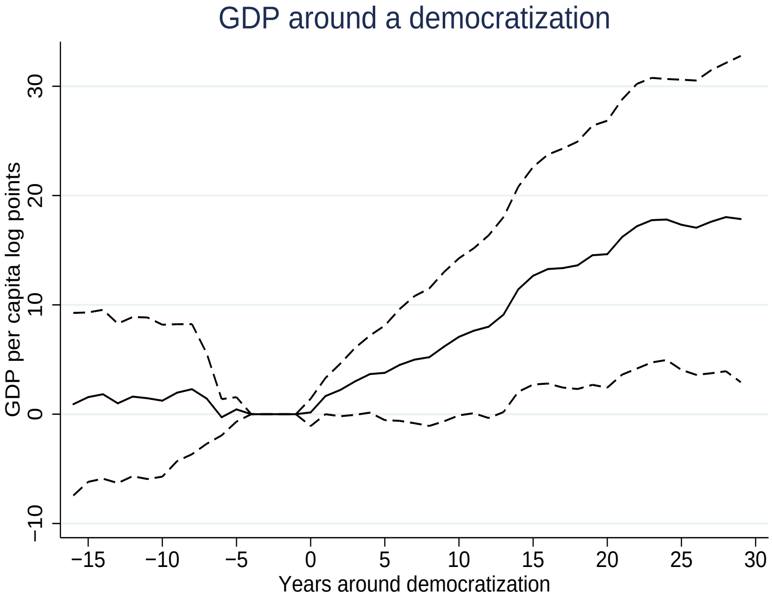
Semi-parametric Control Strategies

- Following Hirano, Imbens, Rider (2003)

$$\hat{\beta}^j = E\left[\Delta y_{ct+j}\left(\frac{1\{\Delta D_{ct}=1\}}{\hat{P}_{ct}} - \frac{1\{\Delta D_{ct}=0\}}{1-\hat{P}_{ct}}\right)\right]$$

- $\hat{P}_{ct}$ - propensity score estimated from a Probit for whether $\Delta D_{ct} = 1$ conditional on $D_{ct-1} = 0$ and $y_{ct-1}, y_{ct-2}, y_{ct-3}, y_{ct-4}, \delta_t$

General Dynamics



Instrumental Variables

- The extensive increase in democratization from 1960 to 2010 took place in regional waves
  - For example: the recent Arab Spring, Latin America and the Caribbean in the 80s, or Eastern European countries in the 90s.
  - No consensus on causes, but literature has emphasized the spread of dissatisfaction or cross-country learning. Not driven by regional economic shocks
- Instrument: jack-knifed average democracy in a region $\times$ initial regime cell

First-Stage Regression

Covariates:	(1)	(2)	GDP in 1960 quintiles× year effects (3)	Soviet dummies (4)	Regional GDP (5)	Regional Unrest (6)	Regional Trade (7)	Region Trends (8)
Democracy wave t-1	0.800	0.547	0.503	0.480	0.537	0.530	0.543	0.498
	(0.073)	(0.101)	(0.130)	(0.099)	(0.100)	(0.098)	(0.102)	(0.092)
Democracy wave t-2		0.133	0.109	0.133	0.133	0.128	0.123	0.129
		(0.081)	(0.094)	(0.080)	(0.079)	(0.081)	(0.081)	(0.081)
Democracy wave t-3		0.227	0.270	0.223	0.223	0.228	0.232	0.228
		(0.067)	(0.077)	(0.065)	(0.069)	(0.067)	(0.068)	(0.070)
Democracy wave t-4		-0.087	-0.119	-0.075	-0.091	-0.067	-0.084	-0.123
		(0.110)	(0.126)	(0.110)	(0.110)	(0.110)	(0.113)	(0.106)
$F-$ statistic	119.1	33.2	16.8	26.7	29.6	33.1	33.2	23.7
Observations	6,312	6,309	5,496	6,309	6,309	6,309	6,309	6,309
Countries	174	174	174	174	174	174	174	174

Exclusion Restriction Assumption

$$E[Z_{cs}\epsilon_{ct}] = 0 \forall s \leq t-1$$

- Holds if ϵ_{ct} not clustered within regions (conditional on controls), or democratic waves not driven by unobserved regional economic shocks
- Previous table suggests observable regional shocks do not explain waves.

2SLS Results

	Base	*Panel A: 2SLS estimates*							
Covariates:				GDP in 1960 quintiles$\times$ year effects	Soviet dummies	Regional GDP	Regional Unrest	Regional Trade	Region Trends
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Democracy	0.787	0.966	1.149	1.125	1.292	2.570	1.272	0.955	1.697
	(0.226)	(0.558)	(0.554)	(0.689)	(0.651)	(0.762)	(0.597)	(0.576)	(0.885)
GDP persistence	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.95
p-value (test < 1)	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Long-run effect	21.24	26.31	31.52	35.23	35.72	59.36	31.88	23.22	36.79
p-value	[0.003]	[0.123]	[0.070]	[0.140]	[0.074]	[0.005]	[0.059]	[0.130]	[0.075]
Hansen p-value			0.21	0.18	0.32	0.19	0.62	0.21	0.28
Observations	6336	6312	6309	5496	6309	6309	6309	6309	6309
Countries in sample	175	174	174	148	174	174	174	174	174
Exc. Instruments F-stat.		119.1	33.2	16.8	26.7	29.6	33.1	33.2	23.7
Long-run effect	21.24	26.31	31.52	35.23	35.72	59.36	31.88	23.22	36.79
p-value	[0.003]	[0.123]	[0.070]	[0.140]	[0.074]	[0.005]	[0.059]	[0.130]	[0.075]
GDP persistence	0.96	0.96	0.96	0.97	0.96	0.96	0.96	0.96	0.95

Mechanisms?

Outcome:	Investment share in GDP (1)	TFP (2)	Economic reforms (3)	Trade share in GDP (4)	Tax revenue share in GDP (5)	Primary enrollment (6)	Secondary enrollment (7)	Child mortality (8)	Riots and revolts (9)
Democracy	2.391	-0.205	0.687	0.689	3.311	1.042	1.345	-0.253	-7.832
	(1.114)	(0.276)	(0.348)	(0.676)	(1.409)	(0.338)	(0.610)	(0.063)	(2.185)
Outcome persistence	0.74	0.93	0.88	0.87	0.79	0.95	0.93	0.99	0.34
p-value (test < 1)	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Long-run effect	9.11	-2.88	5.58	5.45	16.06	21.91	18.96	-34.26	-11.94
p-value	[0.032]	[0.455]	[0.053]	[0.300]	[0.016]	[0.004]	[0.028]	[0.001]	[0.000]
Observations	5665	3879	4692	5738	4511	3714	2883	6084	5646
Countries in sample	169	107	150	172	131	166	158	173	171
Long-run effect	9.11	-2.88	5.58	5.45	16.06	21.91	18.96	-34.26	-11.94
p-value	[0.032]	[0.455]	[0.053]	[0.300]	[0.016]	[0.004]	[0.028]	[0.001]	[0.000]
Outcome persistence	0.74	0.93	0.88	0.87	0.79	0.95	0.93	0.99	0.34

Does Democracy need Development?

Some argue that democracy requires preconditions, especially related to development and education, to work:

- Richard Posner: Dictatorship will often be optimal for very poor countries. Such countries tend not only to have simple economies but also to lack the cultural and institutional preconditions to democracy.
- The authors investigate this hypothesis by considering interactions between democracy and initial level of development and human capital before the transition.

Heterogenous Effects

Interaction with:	log GDP per capita:				Share with secondary:			
Measured at:	1960	1970	1980	Current	1960	1970	1980	Current
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Democracy	0.432	0.572	0.687	0.744	0.446	0.340	0.385	0.495
	(0.275)	(0.248)	(0.248)	(0.246)	(0.254)	(0.253)	(0.246)	(0.241)
Interaction	0.001	0.001	0.002	0.001	0.046	0.049	0.038	0.020
	(0.002)	(0.001)	(0.002)	(0.002)	(0.028)	(0.020)	(0.014)	(0.013)
Long-run effect [25th percentile]	16.23	18.63	20.49	19.84	13.79	10.48	11.84	14.60
p-value	[0.146]	[0.040]	[0.017]	[0.016]	[0.107]	[0.205]	[0.145]	[0.083]
Observations	4281	4909	5525	6336	5300	5300	5300	5300
Countries in sample	93	109	131	175	138	138	138	138

To conclude

- From 1960 to 2010, democratization was associated with a 20% increase in GDP in the 30 years following the event
- Previous literature did not reach a consensus because of failures to address the empirical challenges
- Some evidence on channels (but more needed), and that democracy does not need development to work.

- We still need a better understanding of:
  - When and why are democracies more responsive to broader segments of society than non-democracies?
  - Is this always good for growth? or excess redistribution?
  - When is the distribution of political power induced by democracy stable?
  - What is the role and interaction of some particular components of democracy (e.g, checks and balances and free elections)?

Lecture 5 outline

- Overview of the literature on democracy and development
  Acemolgu et al (2014)
- Virtues of democracies: Political accountability
  Ferraz and Finan (2007)
- Virtues of democracies: Legitimacy
  Dal Bo, Foster, and Putterman (2011)
- Virtues of democracies: CDD
  Casey, Glennerster, and Miguel (2011)

Information and accountability - Ferraz and Finan 2007

- Corruption is major obstacle to economic development
- Information asymmetries are a major contributing factor to widespread prevalence of systemic corruption
  - Numerous countries have adopted anti-corruption policies predicated on transparency
- In a functioning democracy, the provision of information can have two effects:
  1. Discipline policy makers
  2. Empower citizens to select better policymakers

Information and accountability - Ferraz and Finan 2007

Theoretical framework (Besley 2006)

- 2-period model
- 2-types of politicians
  - c - corrupt politician
  - nc - non-corrupt politician
- π - proportion of non-corrupt politicians in the pool of potential candidates

Information and accountability - Ferraz and Finan 2007

- Each period the elected politician sets a state-dependent policy $e_t(s_t, i)$
  - $i \in \{c, nc\}$ - type of politician
  - $s_t \in \{0, 1\}$ - state of the world at time t
- Each state occurs with equal probability and is only observed by the incumbent politician.

Information and accountability - Ferraz and Finan 2007

- Voters' payoff:

$$\begin{cases} V & \text{if } e_t = s_t \\ 0 & \text{o.w.} \end{cases}$$

- $e_t(s_t, nc) = s_t$ - non-corrupt politicians set policy to maximize voters' objectives

- corrupt politicians's payoff at period t:

$$\begin{cases} r_t & \text{if } e_t \neq s_t \\ 0 & \text{o.w.} \end{cases}$$

- $r_t \sim G(r)$ with mean μ and finite support $[0, R]$
- $R > \beta(\mu + E)$, where E - ego rents and β - discount factor

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents
- Politicians choose e_t setting policy

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents
- Politicians choose e_t setting policy
- With probability χ (independent of type) voters observe their payoff V

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents
- Politicians choose e_t setting policy
- With probability χ (independent of type) voters observe their payoff V
- With probability τ voters observe the politician's type

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents
- Politicians choose e_t setting policy
- With probability χ (independent of type) voters observe their payoff V
- With probability τ voters observe the politician's type
- Voters head to the polls to either reelect the incumbent or select a random challenger from the pool of potential politicians

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents
- Politicians choose e_t setting policy
- With probability χ (independent of type) voters observe their payoff V
- With probability τ voters observe the politician's type
- Voters head to the polls to either reelect the incumbent or select a random challenger from the pool of potential politicians
- After elections, the corrupt politicians receive another independent draw r_2

Information and accountability - Ferraz and Finan 2007

Timing of the game

- Beginning of the period $\rightarrow$ politicians is elected
- s_t - state of world is revealed to incumbent
- $i \in \{c, nc\}$ - politician type is revealed (if newly elected)
- r_t - revealed to corrupt incumbents
- Politicians choose e_t setting policy
- With probability χ (independent of type) voters observe their payoff V
- With probability τ voters observe the politician's type
- Voters head to the polls to either reelect the incumbent or select a random challenger from the pool of potential politicians
- After elections, the corrupt politicians receive another independent draw r_2
- Period 2 actions then follow and payoffs are realized. World ends.

Information and accountability - Ferraz and Finan 2007

- Perfect Bayesian Nash equilibrium

Information and accountability - Ferraz and Finan 2007

- Perfect Bayesian Nash equilibrium
- Period 2, absent re-election incentives, each politician sets his preferred policy

Information and accountability - Ferraz and Finan 2007

- Perfect Bayesian Nash equilibrium
- Period 2, absent re-election incentives, each politician sets his preferred policy
  - $e_2(s, nc) = s_2$

Information and accountability - Ferraz and Finan 2007

- Perfect Bayesian Nash equilibrium

- Period 2, absent re-election incentives, each politician sets his preferred policy
  - $e_2(s, nc) = s_2$
  - $e_2(s, c) = 1 - s_2$

Information and accountability - Ferraz and Finan 2007

- Perfect Bayesian Nash equilibrium
- Period 2, absent re-election incentives, each politician sets his preferred policy
  - $e_2(s, nc) = s_2$
  - $e_2(s, c) = 1 - s_2$
- Voters want maximize the likelihood that a non-corrupt politician is elected to period 2

Information and accountability - Ferraz and Finan 2007

Voting rule: Re-elect the incumbent politicians if voters observe V.
Why?

Information and accountability - Ferraz and Finan 2007

Voting rule: Re-elect the incumbent politicians if voters observe V. Why?

Let λ denote the probability that a corrupt incumbent does what voters want (i.e. is disciplined). Then the probability that the politician is non-corrupt conditional on observing V

$$Pr(i = NC|V) = \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(V)}$$

Information and accountability - Ferraz and Finan 2007

Voting rule: Re-elect the incumbent politicians if voters observe V. Why?

Let λ denote the probability that a corrupt incumbent does what voters want (i.e. is disciplined). Then the probability that the politician is non-corrupt conditional on observing V

$$Pr(i = NC|V) = \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(V)}$$

$$= \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(i = NC) + Pr(i = C)\lambda}$$

Information and accountability - Ferraz and Finan 2007

Voting rule: Re-elect the incumbent politicians if voters observe V. Why?

Let λ denote the probability that a corrupt incumbent does what voters want (i.e. is disciplined). Then the probability that the politician is non-corrupt conditional on observing V

$$Pr(i = NC|V) = \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(V)}$$

$$= \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(i = NC) + Pr(i = C)\lambda}$$

$$= \frac{1 \cdot \pi}{\pi + (1 - \pi)\lambda}$$

Information and accountability - Ferraz and Finan 2007

Voting rule: Re-elect the incumbent politicians if voters observe V. Why?

Let λ denote the probability that a corrupt incumbent does what voters want (i.e. is disciplined). Then the probability that the politician is non-corrupt conditional on observing V

$$Pr(i = NC|V) = \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(V)}$$

$$= \frac{Pr(V|i = NC)Pr(i = NC)}{Pr(i = NC) + Pr(i = C)\lambda}$$

$$= \frac{1 \cdot \pi}{\pi + (1 - \pi)\lambda}$$

$$Pr(i = NC|V) \geq \pi$$

What if voters do not observe V? $\rightarrow$ voters re-elect the incumbent

Information and accountability - Ferraz and Finan 2007

Period 1 equilibrium

- $e_1(s, nc) = s_1$: Non-corrupt behave in accordance with voters preferences

- Corrupt incumbents face a tradeoff:
  - Extract rents r_1 in period 1 and forgo re-election
  - Behave as a non-corrupt politician to guarantee re-election and reap the benefits of a second term

- What is the probability that a corrupt politician pools?

Information and accountability - Ferraz and Finan 2007

What is the probability that a corrupt politician pools?

- Suppose that corrupt politicians decides to be corrupt.
  - Then voters will observe that he is corruption with probability: $\tau + (1-\tau)\chi$
  - He is re-elected: $(1-\tau)(1-\chi)$

- Doing what voters want, the corrupt politician gets re-elected: $1-\tau$

- Cost-Benefit:

$$\begin{aligned} r_1 + (1-\tau)(1-\chi)(\beta(\mu+E)) &\leq (1-\tau)(\beta(\mu+E)) \\ r_1 &\leq \chi(1-\tau)(\beta(\mu+E)) \end{aligned}$$

- A corrupt politician will pool with probability: $\lambda = G(\chi(1-\tau)(\beta(\mu+E)))$

Information and accountability - Ferraz and Finan 2007

Implications of the model

- Suppose we increase χ - probability of observing the policy

$$\frac{\partial \lambda}{\partial \chi} > 0$$

  - More discipline but worse selection in period 2
- Suppose we increase τ - probability of observing the politician's type

$$\frac{\partial \lambda}{\partial \tau} < 0$$

  - Less discipline but better selection in period 2

Information and accountability - Ferraz and Finan 2007

What about ex ante voter welfare?

- Period 1

$$V_1(\lambda) = [\pi + (1-\pi)\lambda]V$$

- Period 2

$$V_2(\lambda) = \pi V + (1-\pi)\lambda[\tau\pi V] + (1-\pi)(1-\lambda)[\tau\pi V + (1-\tau)\chi\pi V]$$

- Ex-ante discounted welfare

$$W(\lambda) = V_1(\lambda) + \beta V_2(\lambda)$$

- Increase in χ increases welfare
- Increase in τ ambiguous $\rightarrow$ could be negative with low π (i.e. better information is not too value because all politicians are corrupt)

Information and accountability - Ferraz and Finan 2007

- Research question: Does disclosing local government corruption practices affect the re-election success of mayors in municipal elections?

Information and accountability - Ferraz and Finan 2007

- Research question: Does disclosing local government corruption practices affect the re-election success of mayors in municipal elections?

- Another point about the theory
  - The effects of providing information ultimately depend on people's prior beliefs

Information and accountability - Ferraz and Finan 2007

- Research question: Does disclosing local government corruption practices affect the re-election success of mayors in municipal elections?
- Another point about the theory
  - The effects of providing information ultimately depend on people's prior beliefs
  - Voters may punish corrupt politicians but it assumes
    - voters care about corruption
    - politicians committed more corruption than expected
  - If corruption is revealed but less than voters' expected then information may actually improve re-election chances

Information and accountability - Ferraz and Finan 2007

- What did the previous empirical literature have to about this question?

Information and accountability - Ferraz and Finan 2007

- What did the previous empirical literature have to about this question?
- Not much! For at least two reasons:

Information and accountability - Ferraz and Finan 2007

- What did the previous empirical literature have to about this question?
- Not much! For at least two reasons:
    1. Identification problems associated with the non-random nature of information dissemination

Information and accountability - Ferraz and Finan 2007

- What did the previous empirical literature have to about this question?
- Not much! For at least two reasons:
  1. Identification problems associated with the non-random nature of information dissemination
  2. Poor measures of corruption

Information and accountability - Ferraz and Finan 2007

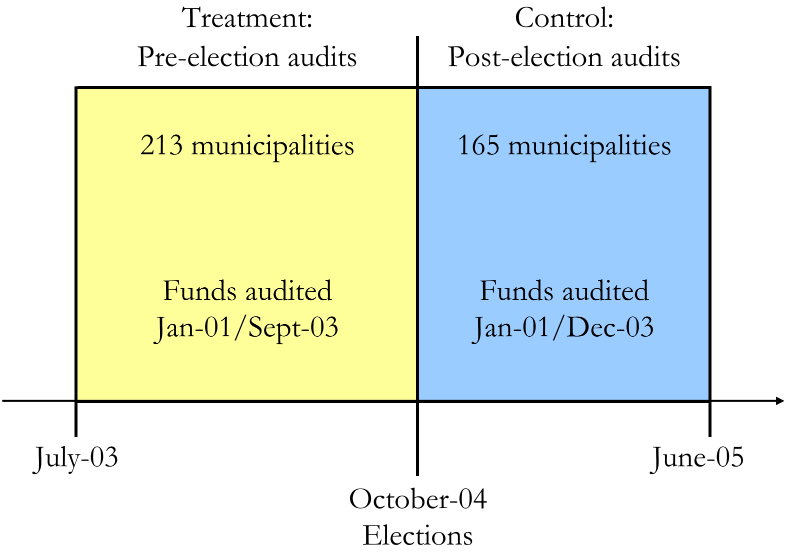
- What did the previous empirical literature have to about this question?
- Not much! For at least two reasons:
  1. Identification problems associated with the non-random nature of information dissemination
  2. Poor measures of corruption
- Contribution was this paper was to overcome these two liimitations

Information and accountability - Ferraz and Finan 2007

Our approach → exploit an anti-corruption policy in Brazil

- Randomly selects municipalities for audits
- Public disseminates the findings to both the municipality and the general media
    - Measures a mayor's corruptness
    - Role of media in disseminating the information

Timing of the release of the audits - Ferraz and Finan 2007



Brazil's anti-corruption policy - Ferraz and Finan 2007

- Brazil is one of the most decentralized countries in the world
- Local governments provide health, primary school education, infrastructure, sanitation
- Mostly paid for from federal block grants
- Concerned with extent of local corruption, in May 2003 the Federal government began to audit federal funds transferred to municipalities
- Each month the Controladoria Geral da Uniao (CGU), joint with the national lottery, draws 60 municipalities randomly across 5000 municipalities

Lottery - Ferraz and Finan 2007

Information and accountability - Ferraz and Finan 2007

- 10-20 auditors are immediately sent to examine the allocation of the federal funds
  - Local governments are required to provide proof of purchase for any public good
  - Talk to contractors and suppliers, members of the communities, program beneficiaries
  - Goal: To produce evidence that could be used in a court of law
- After a week of inspections, a detail report describing all the irregularities is submitted to Brasilia
- A summary of the findings is posted on the internet and disclosed to the mass media

Documentation - Ferraz and Finan 2007

Evidência:

Visita à Escola, entrevista à professora e fotografias anexas.

Sala da Escola Joaquim Gomes Bezerra

Sala da Escola Joaquim Gomes Bezerra

Vista Frontal da Escola Joaquim G. Bezerra

Documentation - Ferraz and Finan 2007

Documentation - Ferraz and Finan 2007

Evidência:

1- Detalhe das casas em construção.

2- Detalhe das casas em construção.

Evidência:

1- Passagem molhada em Jaburuna.

2- Passagem molhada em Boi Morto.

Key aspects of the program - Ferraz and Finan 2007

- Municipalities are randomly selected $\rightarrow$ Address identification issues
- Audit reports are publicly available $\rightarrow$ Measure corruption and the information voters received
- Media was used to disseminated audit findings $\rightarrow$ program to have a differential effect in municipalities with local media

Anecdotal evidence - Ferraz and Finan 2007

- The conclusions from the CGU were used extensively in the political campaigns, by not only the opposition parties but those that received positive reports as well...The reports were decisive in several cities. In the small city of Vicosa, in Alagoas, where a lot of corruption was found, the mayor Flavis Flaubert (PL) was not re-elected. He lost by 200 votes to Pericles Vasconcelos (PSB), who during his campaign use pamphlets and large-screen tv in the citys downtown to divulge the report. Flaubert blames the CGU for his lost. (Diario de Para)

Anecdotal evidence - Ferraz and Finan 2007

- Giovanni Brillantino from Itagimirim, in Bahia, who just before the elections claimed that We knew that the opposition party would exploit this information in the election. (Folha de Sao Paulo)
- In Taperoa, Bahia, where several incidences of fraud were uncovered, the local legislator Victor Meirelles Neto (PTB) claimed that the population was shocked when this information was revealed (Agencia Folha 12/06/2003).

Coding corruption - Ferraz and Finan 2007

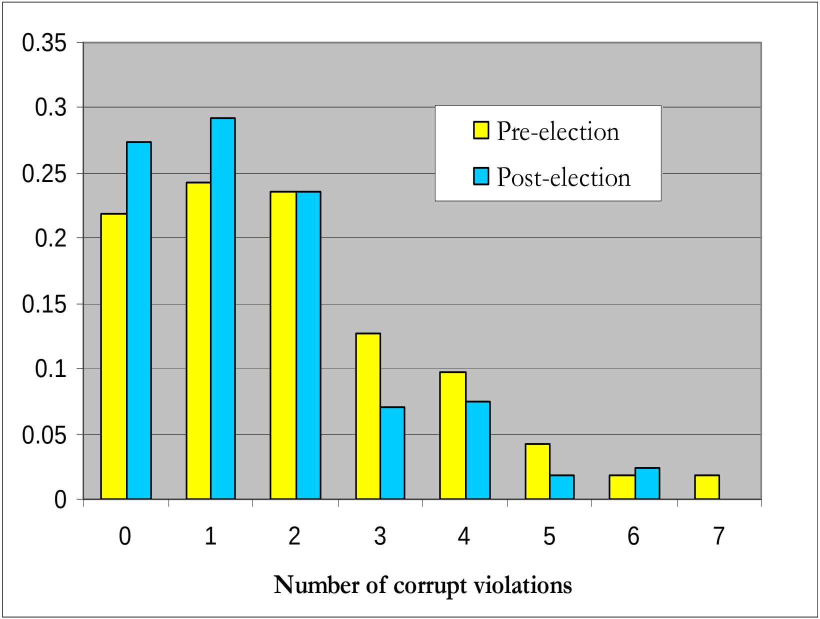
Malhada de Pedras, BA (lottery 5):

Fraud, diversion of funds, and use of fake receipts associated with the Fundef program: the auditors identified R$100,000 in fake receipts used by the municipal government to account for Fundef related expenditures. Based on interviews conducted by the auditors, all twelve firms that appear as product suppliers on the receipts claimed to have never done business with the local government. The auditors also discovered that more than R$610,000 of Fundef funds, were used irregularly between 2002 and 2003. The funds were used to pay wages of persons not associated with education.

Measuring corruption - Ferraz and Finan 2007

- Based on the audit reports, we define corruption as any irregularity associated with:
  - Fraud in procurement
  - Diversion of public resources
  - Over-invoicing
- Measure: Number of irregularities associated with corruption

Distribution of corrupt violations - Ferraz and Finan 2007



Data sources - Ferraz and Finan 2007

- Corruption data
  - Audit reports
- Election data
  - Results for 2000 and 2004 mayor elections, mayor characteristics, measures of political competition, and electoral performance
- Municipal data
  - 1999 municipal survey: general characteristics of the municipality including laws and regulations
- Economic data
  - 2000 population census: measure of per capita income, Gini, demographic characteristics

Summary stats - Ferraz and Finan 2007

	Post-election audit (1)	Pre-election audit (2)	Difference (3)	Standard error (4)
Panel A: Political characteristics				
Re-election rates for the 2004 elections	0.413	0.395	0.018	0.045
Re-election rates for the 2000 elections	0.423	0.443	-0.020	0.040
2004 re-election rates, among those that ran	0.585	0.559	0.026	0.044
Ran for re-election in 2004	0.707	0.707	-0.001	0.060
Number of parties in 2000	2.881	2.933	-0.052	0.140
Margin of victory in 2000	0.142	0.131	0.012	0.019
Mayor's vote share in 2000	0.529	0.525	0.004	0.013
Panel B:Mayor characteristics:				
Age	47.5	48.0	-0.5	0.9
Years of education	12.2	12.0	0.3	0.3
Male	0.96	0.94	0.02	0.03

Summary stats - Ferraz and Finan 2007

	Post-election audit (1)	Pre-election audit (2)	Difference (3)	Standard error (4)
Panel C: Municipal characteristics:				
Population density (Persons/km)	0.57	0.73	-0.16	0.33
Literacy rate (%)	0.81	0.80	0.01	0.03
Urban (%)	0.62	0.62	0.00	0.05
Log per capita income	4.72	4.66	0.06	0.15
Income inequality	0.55	0.54	0.00	0.01
Zoning laws	0.29	0.21	0.08	0.07
Economic Incentives	0.66	0.58	0.07	0.06
Paved roads	58.99	58.30	0.69	7.74
Size of public employment	42.45	42.76	-0.32	1.53
Municipal guards	0.20	0.21	-0.01	0.07
Small claims court	0.38	0.34	0.04	0.08
Judiciary district	0.59	0.56	0.03	0.07
Number of Newspapers	3.58	2.21	1.37	0.79
Municipalities with a radio stations	0.31	0.24	0.07	0.06
Number of radio stations, conditional on having one	1.37	1.29	0.08	0.11
Number of corrupt violations	1.952	1.584	0.369	0.357
Total resources audited ($R)	5,770,189	5,270,001	500,188	1,361,431

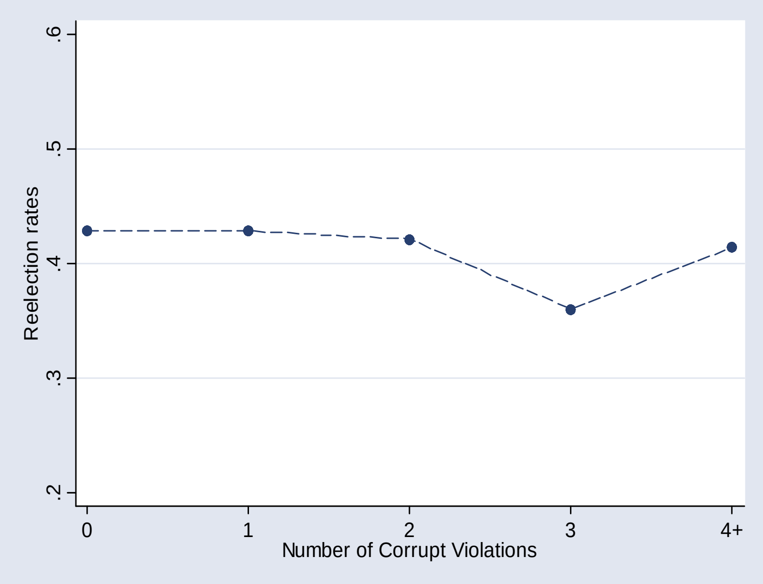
Sample of interest - Ferraz and Finan 2007

- CGU audits municipalities with a population of less than 450,000 inhabitants (excludes 8 percent of Brazilian municipalities)
- Mayors that are eligible for re-election
  - Excludes second-term mayors
  - Focus is on mayors and not political parties
- Municipalities that were audited

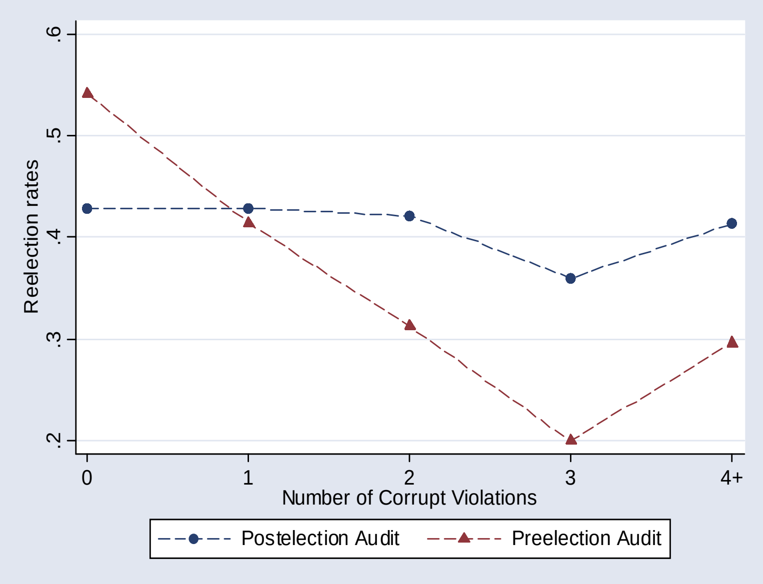
Results - Ferraz and Finan 2007

	All incumbent		Only mayors that ran for reelection				
	Pr(re-election)		Pr(re-election)	Vote share	Win margin	Change in vote share	Change in win margin
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Preelection Audit (1/0)	-0.036	-0.036	-0.059	-0.055	-0.020	-0.032	-0.028
	[0.053]	[0.052]	[0.065]	[0.072]	[0.027]	[0.018]+	[0.027]
Observations	373	373	263	263	263	263	263
R-squared	0.05	0.17	0.22	0.16	0.22	0.39	0.31
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal characteristics	No	Yes	Yes	Yes	Yes	Yes	Yes
Mayor characteristics	No	Yes	Yes	Yes	Yes	Yes	Yes

Results - Ferraz and Finan 2007



Results - Ferraz and Finan 2007



Results - Ferraz and Finan 2007

	Linear		Quadratic	Semi-parametric	Corruption ≤ 5	Corruption ≤ 4
	(1)	(2)	(3)	(4)	(5)	(6)
Preelection audit	0.029	0.030	0.126	0.084	0.068	0.086
	[0.083]	[0.082]	[0.101]	[0.104]	[0.087]	[0.088]
Preelection audit × Number of corrupt violations	-0.038	-0.038	-0.200		-0.070	-0.088
	[0.035]	[0.035]	[0.090]*		[0.041]+	[0.043]*
Preelection audit × Number of corrupt violations^2			0.034			
			[0.017]*			
Preelection audit × Corruption = 0				0.010		0.003
				[0.156]		[0.036]
Preelection audit × Corruption = 2				-0.253		
				[0.148]+		
Preelection audit × Corruption = 3				-0.321		
				[0.192]+		
Preelection audit × Corruption = 4+				-0.159		
				[0.168]		
Observations	373	373	373	373	362	351

Results - Ferraz and Finan 2007

Dependent variables:	Pr(re-election)		Margin of victory		Vote share		Change in vote share	
	Full sample	Corruption ≤ 5	Full sample	Corruption ≤ 5	Full sample	Corruption ≤ 5	Full sample	Corruption ≤ 5
	(1)	(2)	(4)	(5)	(7)	(8)	(10)	(11)
Preelection audit	0.045	0.072	0.037	0.053	0.078	0.104	-0.014	0.006
	[0.095]	[0.099]	[0.037]	[0.039]	[0.102]	[0.106]	[0.027]	[0.027]
Preelection audit × Corrupt violations	-0.06	-0.086	-0.034	-0.049	-0.078	-0.104	-0.01	-0.029
	[0.039]	[0.046]+	[0.015]*	[0.019]**	[0.041]+	[0.048]*	[0.012]	[0.013]*
Number of corrupt violations	-0.016	0.001	0.011	0.019	-0.002	0.014	-0.001	0.01
	[0.030]	[0.036]	[0.012]	[0.014]	[0.032]	[0.039]	[0.010]	[0.010]

Results - Ferraz and Finan 2007

- Treatment effect by corruption
  - With one violation, the audit policy reduced re-election rates by 4.6 percentage points
  - With 3 violations, the audit policy reduced re-election rates by 17.7 percentage points
- Interpretation
  - Voters priors are that the average politician is corrupt
  - Politicians are punished only when found to be extremely corruption
  - Politicians that are not corrupt are reward at the polls

Threats to identification - Ferraz and Finan 2007

- Municipalities were randomly selected!

Threats to identification - Ferraz and Finan 2007

- Municipalities were randomly selected!
- But, this is does NOT guarantee that the audits themselves were not corrupt
  - Mayors affiliated with the state or national party might have received more favorable audits
  - Mayors engaged in tightly contested elections may have a higher incentive to bribe auditors
- Unlikely
  - Corruption levels were balanced
  - Interviews
  - Robustness tests

Robustness - Ferraz and Finan 2007

	Full sample				Corruption ≤ 5		Corruption ≤ 4	
Dependent variable:	Number of corrupt violations		Pr(re-election)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Preelection audit	-0.332	-0.231	0.067	0.079	0.043	0.096	0.056	0.111
	[0.261]	[0.298]	[0.121]	[0.132]	[0.110]	[0.125]	[0.115]	[0.129]
Preelection audit × Number of corrupt violations			-0.21	-0.180	-0.08	-0.071	-0.09	-0.088
			[0.091]*	[0.090]*	[0.040]+	[0.039]+	[0.043]*	[0.041]*
Preelection audit × Number of corrupt violations²			0.035	0.031				
			[0.017]*	[0.017]+				
Preelection audit × Member of the governor's coalition	-0.155	-0.155	0.056	0.055	0.06	0.059	0.1	0.103
	[0.256]	[0.388]	[0.134]	[0.132]	[0.136]	[0.134]	[0.140]	[0.138]
Preelection audit × Margin of victory in 2000 elections		-0.638		-0.09		-0.198		-0.22
		[0.868]		[0.311]		[0.316]		[0.315]
Preelection audit × PT	-0.004	-0.034	0.269	0.299	0.28	0.3	0.186	0.208
	[0.861]	[0.864]	[0.286]	[0.278]	[0.290]	[0.278]	[0.280]	[0.267]
Preelection audit × PMB	0.157	0.132	0.19	0.141	0.145	0.073	0.106	0.033
	[0.389]	[0.398]	[0.130]	[0.128]	[0.134]	[0.130]	[0.136]	[0.134]
Preelection audit × PFL	0.064	0.052	-0	-0.01	-0.08	-0.101	-0.02	-0.033
	[0.445]	[0.455]	[0.153]	[0.147]	[0.157]	[0.149]	[0.160]	[0.151]
Preelection audit × PSDB	-0.456	-0.471	-0.28	-0.25	-0.48	-0.533	-0.52	-0.566
	[0.989]	[0.978]	[0.262]	[0.295]	[0.244]*	[0.241]*	[0.249]*	[0.248]*
Preelection audit × PSB	0.093	0.073	-0.33	-0.44	-0.32	-0.46	-0.29	-0.422
	[0.628]	[0.637]	[0.262]	[0.253]+	[0.262]	[0.253]+	[0.264]	[0.255]+
Preelection audit × PTB	-0.549	-0.562	0.324	0.272	0.295	0.232	0.274	0.216
	[0.591]	[0.594]	[0.207]	[0.221]	[0.212]	[0.227]	[0.216]	[0.231]
Observations	373	373	373	373	362	362	351	351
R-squared	0.35	0.35	0.19	0.28	0.21	0.27	0.22	0.28
F-test of the additional interaction terms (P-value)	0.97	0.97	0.20	0.39	0.09	0.08	0.15	0.13

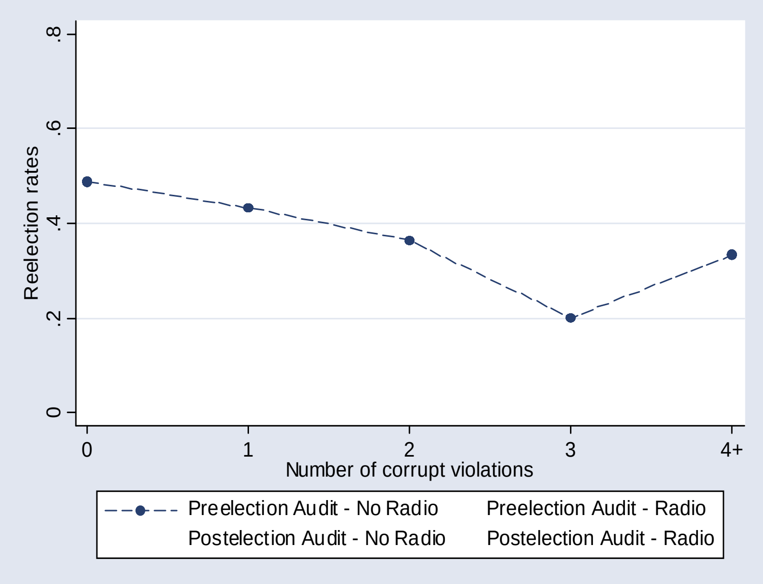
Robustness - Ferraz and Finan 2007

Dependent variable:	Vote share in 2000				Margin of victory in 2000			
	Full Sample		Corruption ≤ 5	Corruption ≤ 4	Full Sample		Corruption ≤ 5	Corruption ≤ 4
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Preelection audit	-0.001	0.007	0.000	0.001	-0.011	-0.003	-0.012	-0.011
	[0.014]	[0.016]	[0.014]	[0.015]	[0.022]	[0.027]	[0.023]	[0.024]
Preelection audit × Number of corrupt violations	-0.003	-0.015	-0.003	-0.004	0.000	-0.014	0.001	0.000
	[0.006]	[0.015]	[0.006]	[0.007]	[0.010]	[0.024]	[0.010]	[0.012]
Preelection audit × Number of corrupt violations^2		0.002				0.003		
		[0.003]				[0.005]		
Number of corrupt violations	0.003	0.009	0.005	0.005	-0.001	0.005	0.001	0.002
	[0.005]	[0.011]	[0.005]	[0.006]	[0.007]	[0.018]	[0.008]	[0.009]
Number of corrupt violations^2		-0.001				-0.001		
		[0.002]				[0.003]		
Observations	369	369	358	347	369	369	358	347
R-squared	0.42	0.42	0.42	0.42	0.17	0.18	0.18	0.18
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mayor characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

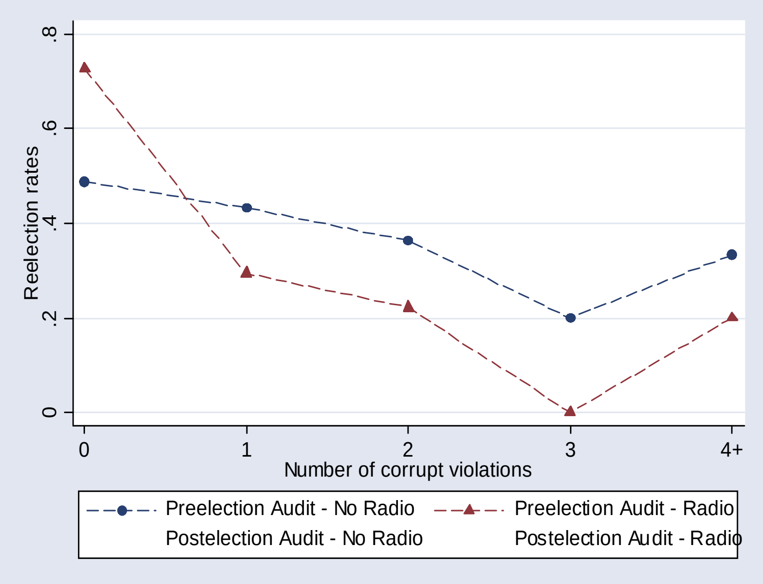
Mechanism - Ferraz and Finan 2007

- So far...convincing evidence of a reduce-form results
  - The audits and their release reduced the likelihood of re-election among mayors found to be corrupt
- Mechanisms
  - Information
  - Campaign contributions
  - Incumbents platform

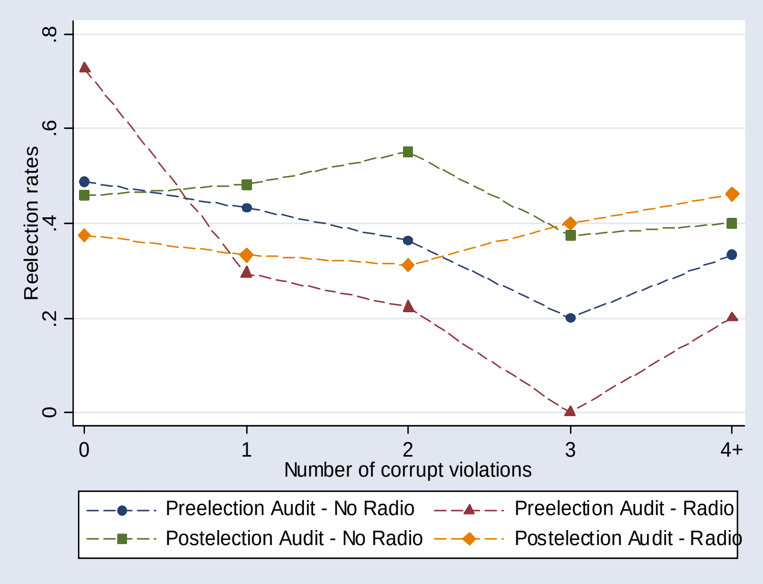
An information story - Ferraz and Finan 2007



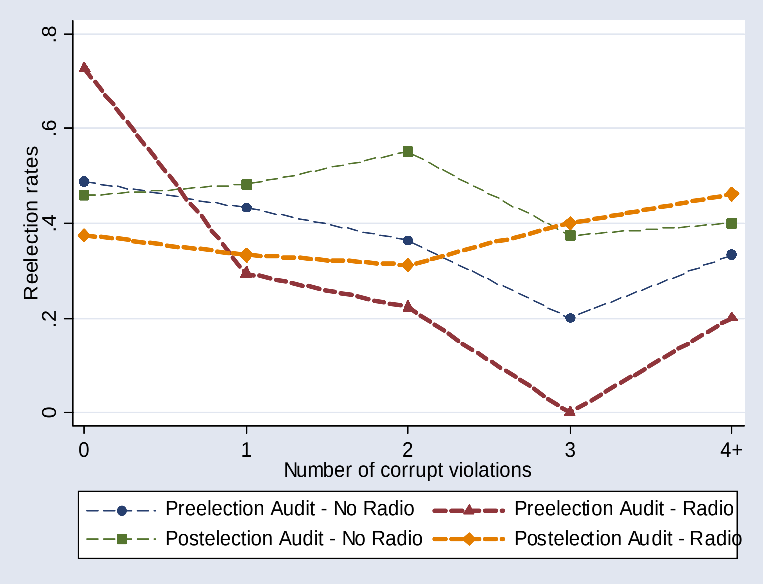
An information story - Ferraz and Finan 2007



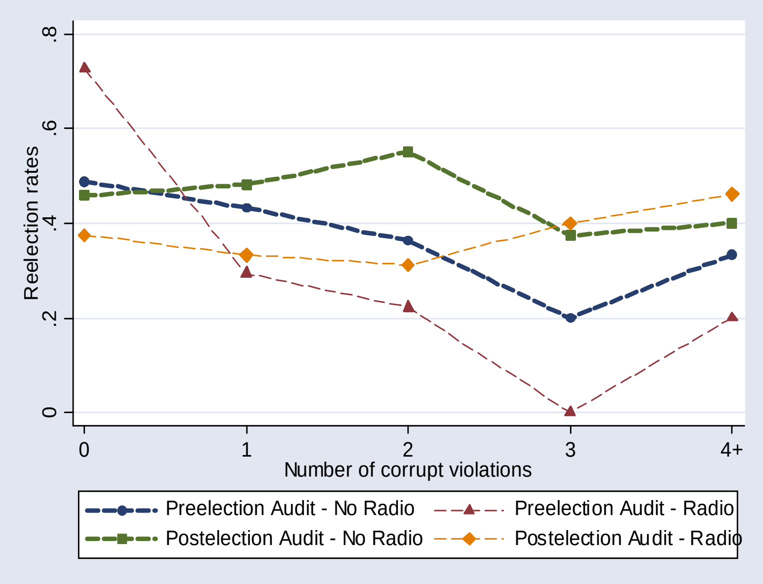
An information story - Ferraz and Finan 2007



An information story - Ferraz and Finan 2007



An information story - Ferraz and Finan 2007



An information story - Ferraz and Finan 2007

Dependent variable: *Pr(re-election)*	Full sample	Corruption ≤ 5	Demographic interactions	Demographic and institutional interactions	Households w/ radio
	(1)	(2)	(3)	(4)	(5)
Preelection audit	-0.059	-0.033	0.296	0.208	-0.954
	[0.091]	[0.096]	[1.121]	[1.247]	[0.629]
Number of corrupt violations	-0.034	-0.013	-0.13	-0.069	-0.161
	[0.029]	[0.035]	[0.224]	[0.288]	[0.194]
Number of radio stations	-0.131	-0.150	-0.216	-0.253	
	[0.064]*	[0.063]*	[0.073]**	[0.083]**	
Preelection audit × Number of radio stations	0.229	0.271	0.356	0.449	
	[0.099]*	[0.104]**	[0.115]**	[0.129]**	
Preelection audit × Number of corrupt violations	0.007	-0.018	-0.236	-0.412	0.458
	[0.038]	[0.044]	[0.402]	[0.430]	[0.229]*
Number of corrupt violations × Number of radio stations	0.050	0.058	0.082	0.09	
	[0.026]+	[0.025]*	[0.025]**	[0.028]**	
Preelection audit × Corrupt violations × Radio stations	-0.118	-0.157	-0.185	-0.238	
	[0.045]**	[0.067]*	[0.051]**	[0.064]**	
Proportion households with radio					-0.834
					[0.782]
Preelection audit × Households w/ radio					1.225
					[0.752]
Number of corrupt violations × Households w/ radio					0.181
					[0.243]
Preelection audit × Corrupt violations × Households w/ radio					-0.645
					[0.292]*

Other mechanims - Ferraz and Finan 2007

- We do not find any evidence that the audits work through other mechanisms such as:
  - Changes in incumbents platforms
  - Type of candidate that the opposition party ran
  - Campaign contribution

Conclusions - Ferraz and Finan 2007

- Our findings lend strong support for the value of information in enhancing political accountability
- How this information is consequently interpreted depends on voters prior beliefs
- These results also highlight the influence media have on political outcomes, and particularly in helping to screen out bad politicians and promoting good politicians. (Besley and Burgess 2004; Stromberg 2004; Besley, Pande, and Rao 2005)

Lecture 5 outline

- Overview of the literature on democracy and development
  Acemolgu et al (2014)
- Virtues of democracies: Political accountability
  Ferraz and Finan (2007)
- Virtues of democracies: Legitimacy
  Dal Bo, Foster, and Putterman (2011)
- Virtues of democracies: CDD
  Casey, Glennerster, and Miguel (2011)

Dal Bo, Foster, and Putterman (2010)

It is not always feasible to consult the whole people, either directly or indirectly, in the formation of the law; but it cannot be denied that, when such a measure is possible, the authority of the law is much augmented. This popular origin, which impairs the excellence and wisdom of legislation, contributes prodigiously to increase its power (de Tocqueville 1839)

Dal Bo, Foster, and Putterman (2010)

- Beyond its effect on policy choices, does the process of democracy have direct effects on individual behavior, and thus outcomes?
- The notion of political legitimacy is key: do people tend to follow laws (or norms) they feel are legitimate? And does democracy tend to promote legitimacy?

Dal Bo, Foster, and Putterman (2010)

- Use a laboratory experiment to estimate democracy effects
- They are able to experimentally manipulate the actual policy chosen (thus eliminating the effect of democracy on policies per se), and then conditioning on the policy, they estimate any impacts of choosing a rule democratically
- A simple game set-up: a classic Prisoners Dilemma. The key vote is a rule change that would change the game from PD to a coordination game. Sometimes this modification occurs endogenously (EndoMod) and sometimes it occurs exogenously as determined by a computer random number generator (ExoMod) (Table 1, Figure 1)

Dal Bo, Foster, and Putterman (2010)

TABLE 1—STAGE GAME PAYOFFS (*in points*)

Initial/unmodified payoffs			Modified payoffs		
	Other's action			Other's action	
Own action	C	D	Own action	C	D
C	50	10	C	50	10
D	60	40	D	48	40

Dal Bo, Foster, and Putterman (2010)

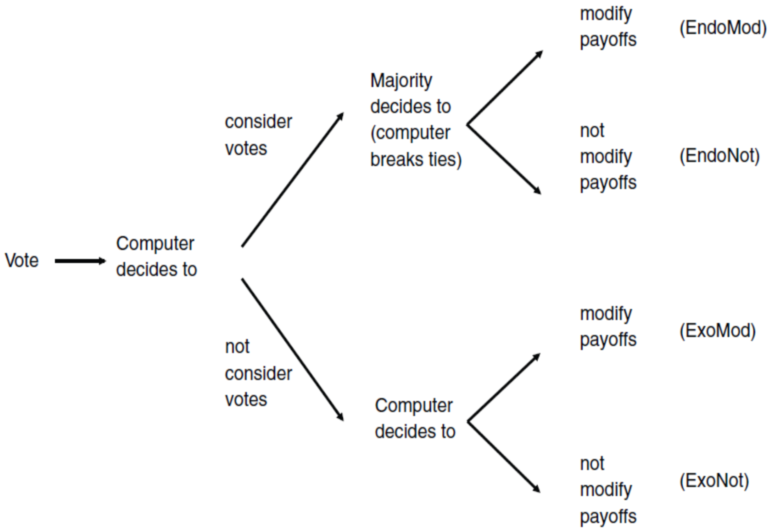


FIGURE 1. VOTING STAGE

Dal Bo, Foster, and Putterman (2010)

- $M \in \{Endo, Exo\}$ - mechanism of selection
- $P \in \{Mod, Not\}$ - payoff structure
- $v_i \in \{Y, N\}$ - vote
- μ_i - type

- $C_i(M, P, v_i, \mu_i)$ - Probability that i cooperates
- $v_i = v(\mu_i)$ - individual's vote only depends on his type
  - individuals are randomly matched
  - do not know how others will vote
- $C_i(M, P, \mu_i)$

Dal Bo, Foster, and Putterman (2010)

$$E(C_i|Endo, P) - E(C_i|Exo, P) =$$

$$\int [C_i(Endo, P, \mu_i) f(\mu_i|Endo, P) - C_i(Exo, P, \mu_i) f(\mu_i|Exo, P)] d\mu_i$$

Even if there is no differences in behavior by mechanism $C_i(Exo, P, \mu_i) = C_i(Endo, P, \mu_i)$, it could still be the case

$$f(\mu_i|Endo, P) \neq f(\mu_i|Exo, P) = f(\mu_i)$$

Identifying the Effects of Democracy

1. Condition on voting

$$f(\mu_i|Endo, P, v_i) = f(\mu_i|Exo, P, v_i) = f(\mu_i, P, v_i)$$

$$E(C_i|Endo, P, v_i) - E(C_i|Exo, P, v_i) =$$
$$\int [C_i(Endo, P, v_i, \mu_i) - C_i(Exo, P, v_i, \mu_i)] f(\mu_i|P, v_i) d\mu_i$$

2. Group level data and the groups for which the votes were tied

Results

TABLE 4—THE EFFECT OF DEMOCRACY–INDIVIDUAL LEVEL DATA

	Consider votes		Not consider votes		
Vote for modify	Modify (EndoMod)	Not modify (EndoNot)	Modify (ExoMod)	Not modify (ExoNot)	Total
Panel A. Number of observations by vote stage outcome and individual vote					
No	17	55	31	26	129
Yes	55	25	33	34	147
Total	72	80	64	60	
Panel B. Cooperation percentage in round 10					
No	5.88	3.64	9.68	11.54	
Yes	5.45	4.00	9.09	8.82	
Total	5.56	3.75	9.38	10.00	
Panel C. Cooperation percentage in round 11					
No	41.18	14.55	41.94	3.85	
Yes	81.82	24.00	57.58	23.53	
Total	72.22	17.50	50.00	15.00	

Results

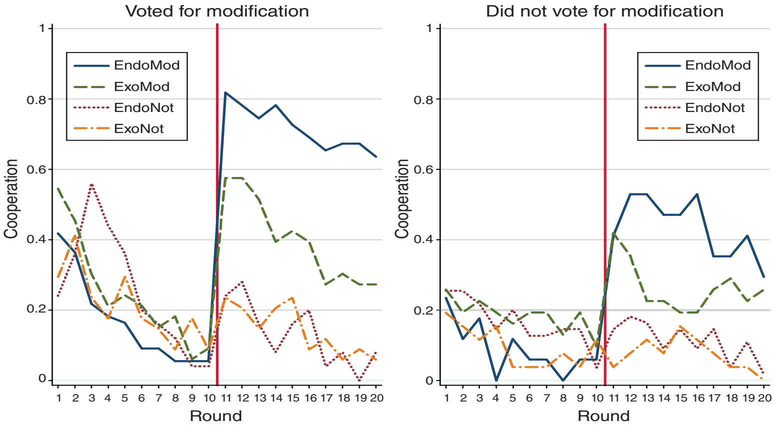


FIGURE 3. COOPERATION BY ROUND, VOTE STAGE RESULTS AND INDIVIDUAL VOTE

Decomposing the Total Effect of an Endogenous Modification

$g(v, M, P)$ - proportion of subjects who voted for $v \in \{Y, N\}$, given, the payoff structure $P \in \{Mod, Not\}$ and mechanism $M \in \{En, Ex\}$

Total Effect of Endogenous Modification

$$\begin{aligned} TE &= g(Y|En, Mod)C(Y|En, Mod) - g(Y|En, Not)C(Y|En, Not) \\ &+ g(N|En, Mod)C(N|En, Mod) - g(N|En, Not)C(N|En, Not) \end{aligned}$$

Decomposing the Total Effect of an Endogenous Modification

$g(v, M, P)$ - proportion of subjects who voted for $v \in \{Y, N\}$, given, the payoff structure $P \in \{Mod, Not\}$ and mechanism $M \in \{En, Ex\}$

Total Effect of Endogenous Modification

$$\begin{aligned} TE &= g(Y|En, Mod)C(Y|En, Mod) - g(Y|En, Not)C(Y|En, Not) \\ &+ g(N|En, Mod)C(N|En, Mod) - g(N|En, Not)C(N|En, Not) \end{aligned}$$

$$\begin{aligned} TE &= g(Y|En, Mod)C(Y|En, Mod) - g(Y|En, Not)C(Y|En, Not) \\ &+ g(N|En, Mod)C(N|En, Mod) - g(N|En, Not)C(N|En, Not) \\ &- g(Y|En, Mod)C(Y|En, Not) + g(Y|En, Mod)C(Y|En, Not) \\ &- g(N|En, Mod)C(N|En, Not) + g(N|En, Mod)C(N|En, Not) \end{aligned}$$

Total Effect

$$
\begin{aligned}
TE &= g(Y|En, Mod)(C(Y|En, Mod) - C(Y|En, Not)) \\
&+ g(N|En, Mod)(C(N|En, Mod) - C(N|En, Not)) \\
&- \{(g(Y|En, Mod) - g(Y|En, Not))C(Y|En, Not) \\
&+ (g(N|En, Mod) - g(N|En, Not))C(N|En, Not)\}
\end{aligned}
$$

TABLE 4—THE EFFECT OF DEMOCRACY–INDIVIDUAL LEVEL DATA

	Consider votes		Not consider votes		
Vote for modify	Modify (EndoMod)	Not modify (EndoNot)	Modify (ExoMod)	Not modify (ExoNot)	Total
Panel A. Number of observations by vote stage outcome and individual vote					
No	17	55	31	26	129
Yes	55	25	33	34	147
Total	72	80	64	60	
Panel C. Cooperation percentage in round 11					
No	41.18	14.55	41.94	3.85	
Yes	81.82	24.00	57.58	23.53	
Total	72.22	17.50	50.00	15.00	

Exogenous Treatment Effect

- Change in cooperation due to an exogenous modification of payoffs
- Proportion of the different types of voters is kept constant to Endo Treatment

$$
\begin{aligned}
ExoTrE &= g(Y|En, Mod)(C(Y|Exo, Mod) - C(Y|Exo, Not)) \\
&+ g(N|En, Mod)(C(N|Exo, Mod) - C(N|Exo, Not))
\end{aligned}
$$

Dal Bo, Foster, and Putterman (2010)

TABLE 4—THE EFFECT OF DEMOCRACY–INDIVIDUAL LEVEL DATA

	Consider votes		Not consider votes		
Vote for modify	Modify (EndoMod)	Not modify (EndoNot)	Modify (ExoMod)	Not modify (ExoNot)	Total
Panel A. Number of observations by vote stage outcome and individual vote					
No	17	55	31	26	129
Yes	55	25	33	34	147
Total	72	80	64	60	
Panel C. Cooperation percentage in round 11					
No	41.18	14.55	41.94	3.85	
Yes	81.82	24.00	57.58	23.53	
Total	72.22	17.50	50.00	15.00	

- Total Effect = ((17/72)41.18+(55/72)81.82) - ((55/80)14.55+(25/80)24)=54.72
- Selection Effect = (17/72 - 55/80)14.55 + (55/72 - 25/80)24 = 4.27
- Endogenous Treatment Effect = 50.45
- Exogenous Treatment Effect = (17/72)(41.94 - 3.85) + (55/72)(57.58 - 23.53) = 36
- Endogeneity Premium (democracy effect) = 14

Is this a story about information?

- One limitation: the fact that the policy was endogenously chosen carries information about the preferences or "types" of other individuals in your group (i.e., the majority prefers the change), whereas in the exogenous modification case there is no such signal of others types

- They attempt to address this in a second set of experiments where they informed individuals in the exogenous case about whether a majority (≥ 2 people) had in fact voted for the coordination game. This should eliminate information effects.

Is this a story about information?

TABLE 11—THE EFFECT OF DEMOCRACY CONTROLLING FOR INFORMATION–MODIFIED PAYOFFS

	Original sessions Consider votes		Additional sessions Not consider votes Vote share	
Vote for modify	Yes (EndoMod)	No (ExoMod)	≥ 2 (ExoModH)	≤ 2 (ExoModL)
Panel A. Number of observations				
No	17	31	20	38
Yes	55	33	56	14
Total	72	64	76	52
Vote for modify	(EndoMod)	(ExoMod)	(ExoModH)	(ExoModL)
Panel B. Cooperation percentage in round 11				
No	41.18	41.94	35.00	23.68
Yes	81.82	57.58	62.50	64.29
Total	72.22	50.00	55.26	34.62
Panel C. Cooperation percentage in part 2				
No	43.53	26.45	22.00	18.42
Yes	71.82	40.00	50.36	33.57
Total	65.14	33.44	42.89	22.50

Note: The column Vote share ≥ 2 (≤ 2) corresponds to the subjects under exogenous modification in the additional sessions who were informed that at least (at most) two subjects in the group had voted for modification.

Dal Bo, Foster, and Putterman (2010)

- Implications for public policy: are social control and law enforcement inherently easier in democracies, due to the greater legitimacy of political / legal institutions?
- Are randomized evaluations that manipulate policy choices not giving us the full picture of the impacts that would prevail if a community itself endogenously chose the policy? (even controlling for the issue that communities with particular characteristics would select into certain policies) E.g., an external NGO imposes rules for the maintenance of public water wells versus those rules voted on by the community
- The external validity of their results to non-anonymous, small groups is uncertain, and the findings may or may not carry over to large, real-world democracies.

Lecture 5 outline

- Overview of the literature on democracy and development
  Acemolgu et al (2014)
- Virtues of democracies: Political accountability
  Ferraz and Finan (2007)
- Virtues of democracies: Legitimacy
  Dal Bo, Foster, and Putterman (2011)
- Virtues of democracies: CDD
  Casey, Glennerster, and Miguel (2011)

Casey, Glennerster, Miguel (2011)

- Many scholars agree that institutions are important determinants of economic development (Acemoglu, Johnson and Robinson 2001, AER). However, there is limited consensus on exactly what the right institutions are, and even less evidence on how to improve existing institutions in poor countries.
- Measuring institutional performance is challenging:
  - Subjective measures are prone to "halo effects"
  - Institutions are multi-faceted, leaving open the risk of data mining or "cherry-picking" of results consistent with prior beliefs
  - Institutions are themselves affected by economic performance (endogeneity)

Casey, Glennerster, Miguel (2011)

- Foreign aid is a highly relevant context for studying these issues.
- Is it possible for foreign aid donors to transform institutions in less developed countries? (Is it even desirable?)
- Among donors today, arguably the most popular strategy to promote accountability, competence and inclusion of under-represented groups in local government institutions is "community driven development" (CDD). Billions of dollars in donor funding per year.

Experience demonstrates that by directly relying on poor people to drive development activities, CDD [community driven development] has the potential to make poverty reduction efforts more responsive to demands, more inclusive, more sustainable, and more cost-effective than traditional centrally led programsachieving immediate and lasting results at the grassroots level. Dongier et al. (2003), World Bank

Casey, Glennerster, Miguel (2011)

- This paper evaluates one attempt to transform local institutions in post-war Sierra Leone.
- They exploit a randomized experiment to assess CDD impacts on local public goods and institutions
- They develop new, objective institutional performance measures, and employ a pre-analysis plan to eliminate data mining.

Intervention

- Financial grants for local public goods, small enterprise development
  - The “GoBifo” Project (”Move Forward”) we study in Sierra Leone gave $4,667 to communities in 3 tranches ($100 per household)
- Training and facilitation to build durable local collective action capacity (6 months of intensive contact spread out over 4 years)
  - Forms a representative Village Development Committee to promote democratic decision-making
  - Helps communities agree on a medium-term development plan
  - Establishes bank accounts and transparent accounting procedures
- Requirements to increase participation of marginalized groups
  - Women were co-signatories on the community bank accounts
  - Recorded how actively women, youths (18-35 years) participated
  - Women and youths managed own projects, e.g. labor groups

Time line

Appendix C: Project and Research Timeline

Month	Activity
Oct-05	Baseline survey
Nov-05	
Dec-05	
Jan-06	Ward Facilitator Training
Feb-06	
Mar-06	
Apr-06	
May-06	Development Planning
Jun-06	
Jul-06	
Aug-06	
Sep-06	
Oct-06	
Nov-06	
Dec-06	
Jan-07	Ward Development Committee Approval
Feb-07	
Mar-07	
Apr-07	Delays
May-07	
Jun-07	
Jul-07	
Aug-07	
Sep-07	

Month	Activity
Oct-07	First grants disbursed
Nov-07	
Dec-07	
Jan-08	Projects implemented
Feb-08	
Mar-08	
Apr-08	Second grants disbursed
May-08	
Jun-08	Projects implemented
Jul-08	
Aug-08	
Sep-08	Third grants disbursed
Oct-08	
Nov-08	Projects implemented
Dec-08	
Jan-09	
Feb-09	
Mar-09	
Apr-09	
May-09	Follow-up survey 1
Jun-09	Voucher program
Jul-09	
Aug-09*	
Sep-09	
Oct-09	Follow-up survey 2
Nov-09	

* *Ex Ante* Analysis Plan submitted to the Jameel Poverty Action Lab archive

Data collection

- Household survey panel (male, female, youth, non-youth respondents)
- Field supervisor direct assessments of local public goods quality.
- Village focus group discussions with local leaders.
- A novel component - structured community activities (SCAs):
  - Matching grant: communities received six vouchers that could be redeemed with a co-pay at a local building materials store (max value $300). A direct measure of collective action capacity.
  - Communal choice: communities were presented with two equally valued assets (batteries vs. salt) and enumerators observed ensuing deliberations, recording the number of male/female and youth/elder speakers as measures of participation and influence.
  - Managing an asset: communities were given a large tarpaulin, use as an agricultural drying floor or roofing material. Focus on elite capture in a surprise follow-up visit 5 months later.

Results - Hardware Effects

Table 2: GoBifo Treatment Effects by Research Hypothesis

Hypotheses by family	GoBifo Mean Effect (std. error)
Family A: Development Infrastructure or "Hardware" Effects	
Mean Effect for Family A (Hypotheses 1, 2 and 3; 37 total outcomes)	**0.352**** **(0.030)**
H1: GoBifo creates functional development committees (7 outcomes)	0.687** (0.062)
H2: GoBifo increases the quality and quantity of local public services infrastructure (16 outcomes)	0.164** (0.040)
H3: GoBifo improves general economic welfare (14 outcomes)	0.399** (0.047)

Results - Hardware Effects

Table 3: Family A: Illustrative Treatment Effects

Outcome variable	Mean in Controls	Treatment Effect	Standard Error	N
	(1)	(2)	(3)	(4)
Panel B: Hypothesis 2 - Local Public Goods				
Functional primary school in the community	0.462	-0.007	(0.050)	464
Functional grain drying floor in the community	0.237	0.104	(0.066)	459
Functional traditional midwife post in the community	0.079	0.175**	(0.035)	235
Functional latrine in the community	0.462	0.210**	(0.059)	234
Functional community center in the community	0.212	0.241**	(0.063)	469
Community took a proposal to an NGO or donor for funding	0.292	-0.156+	(0.081)	460
Supervisor's physical assessment of construction quality (index from 0 to 1):				
Primary School	0.583	0.116*	(0.055)	123
Grain drying floor	0.375	0.142+	(0.076)	101
Latrine	0.270	0.177**	(0.055)	154
Panel C: Hypothesis 3 - Economic Welfare				
Total petty traders in village	2.432	0.719*	(0.344)	225
Total goods on sale of 10	4.449	0.560*	(0.240)	236
Household asset score	-0.170	0.212*	(0.090)	471
Attended trade skills training	0.061	0.119**	(0.018)	235
Income from top 3 cash earning sources (in 1,000 Leones)	746.94	-21.773	(73.069)	236

Results - Software Effects

Table 2: GoBifo Treatment Effects by Research Hypothesis

Hypotheses by family	GoBifo Mean Effect (std. error)
Family B: Institutional and Social Change or "Software" Effects	
Mean Effect for Family B (Hypotheses 4, 5, 6, 7, 8, 9, 10, 11 and 12; 146 total outcomes)	**0.029** **(0.019)**
H4: GoBifo increases collective action and contributions to local public goods (15 outcomes)	0.041 (0.042)
H5: GoBifo enhances inclusion and participation in community decisions, especially for vulnerable groups (43 outcomes)	0.001 (0.031)
H6: GoBifo changes local systems of authority (25 outcomes)	0.048 (0.036)
H7: GoBifo enhances trust (11 outcomes)	0.042 (0.064)
H8: GoBifo builds groups and networks (12 outcomes)	0.033 (0.044)
H9: GoBifo increases access to information about local governance (19 outcomes)	0.003 (0.039)
H10: GoBifo increases participation in local governance (15 outcomes)	0.114** (0.047)
H11: GoBifo reduces crime and conflict (8 outcomes)	0.028 (0.054)
H12: GoBifo fosters more liberal political and social attitudes (9 outcomes)	0.034 (0.041)

Results - Software Effects

Table 4: Structured Community Activities (SCAs): Illustrative Treatment Effects

Structured Community Activity (SCA) Outcome:	Mean for Controls	Treatment Effect	Standard Error
	(1)	(2)	(3)
Panel A. Collective Action and the Building Materials Vouchers			
GoBifo Mean Effect for SCA #1 (13 outcomes in total)	**0.00**	**-0.06**	**(0.05)**
Proportion of communities that redeemed vouchers at building materials store	0.54	-0.01	(0.06)
Average number of vouchers redeemed at the store (out of six)	2.95	0.11	(0.35)
Proportion of communities that held a meeting to discuss the vouchers	0.98	-0.05*	(0.02)
Panel B. Participation in the Gift Choice Deliberation			
GoBifo Mean Effect for SCA #2 (32 outcomes in total)	**0.00**	**0.01**	**(0.04)**
Duration of gift choice deliberation (in minutes)	9.36	1.60	(1.13)
Total adults in attendance at gift choice meeting	54.51	3.50	(3.20)
Total women in attendance at gift choice meeting	24.99	1.99	(1.68)
Total youths (approximately 18-35 years) in attendance at gift choice meeting	23.57	2.10	(1.38)
Total number of public speakers during the deliberation	6.04	0.24	(0.40)
Total number of women who spoke publicly during the deliberation	1.88	-0.19	(0.22)
Total number of youths (approximately 18-35 years) who spoke publicly	2.14	0.23	(0.24)
Proportion of communities that held a vote during the deliberation	0.10	0.07	(0.04)

Cherry Picking

Table 5: Erroneous Interpretations under "Cherry Picking"

Survey question	Mean for controls	Treatment effect	Standard error	N	Hypo
	(1)	(2)	(3)	(4)	(5)
Panel A: Institutions "Deteriorated"					
Attended meeting to decide what to do with the tarp	0.812	-0.037+	(0.021)	236	H5
Everybody had equal say in deciding how to use the tarp	0.509	-0.106+	(0.058)	232	H5
Correctly able to name what the tarp was used for	0.589	-0.08+	(0.048)	236	H9
Community used the tarp (verified by physical assessment)	0.897	-0.079+	(0.044)	233	H4
Community can show research team the tarp	0.836	-0.116*	(0.051)	232	H5
Respondent would like to be a member of the VDC	0.361	-0.043*	(0.021)	236	H10
Current (or acting) village chief/Headman is younger than 35	0.044	-0.038+	(0.023)	229	H12
Respondent voted in the local government election (2008)	0.851	-0.036*	(0.016)	236	H10
Panel B: Institutions "Improved"					
Community teachers have been trained	0.471	0.122+	(0.066)	173	H4
Respondent is a member of a women's group	0.235	0.060**	(0.021)	236	H8
Someone took minutes at the most recent community meeting	0.295	0.140*	(0.063)	227	H5
Building materials stored in a public place when not in use	0.128	0.246*	(0.098)	84	H5
Chiefdom official did not have the most influence over tarpaulin use	0.543	0.058*	(0.029)	236	H6
Respondent agrees with "Responsible young people can be good leaders" and not "Only older people are mature enough to be leaders"	0.762	0.038*	(0.017)	236	H6, H12
Correctly able to name the Section Chief for this section	0.533	0.053+	(0.032)	234	H9
Correctly able to name the year of the next general elections	0.192	0.038*	(0.018)	236	H9

Implications

- The comparative advantage of the World Bank and similar external donors may lie more in building development hardware than in instigating sustainable social change.
- Setting up new organizations may be insufficient to promote social change since they can be co-opted by elites
- Giving marginalized groups formal authority (i.e. political reservations for women in India, Beamen et al. 2009) may be more effective than indirect interventions like CDD that hope to shift social norms, especially when existing authorities are strong (chiefs in Sierra Leone).