## Lectures on Economic Inequality

Warwick, Summer 2017, Slides 5
Debraj Ray

- Overview: Convergence and Divergence
- Inequality and Divergence: Economic Factors
- Inequality and Divergence: Psychological Factors
- Inequality, Polarization and Conflict


## Small and Large Groups in Conflict



- Tyranny of the majority (Tocqueville 1835, Mill 1959) "Society . . . practices a social tyranny more formidable than many kinds of political oppression
... [imposing] its own ideas and practices as rules of conduct on those who dissent from them ..." Mill 1859


## III. Small and Large Groups in Conflict

democracy in america. The Logic of Collective Action

ALEXIS DE TOCQUEVILLE,
avocat a la cour royale de paris,
ETC., ETC.

- Tyranny of the majority (Tocqueville 1835, Mill 1959) "Society . . . practices a social tyranny more formidable than many kinds of political oppression ... [imposing] its own ideas and practices as rules of conduct on those who dissent from them ..." Mill 1859


Tyranny of the minority (Pareto 1927, Olson 1965): "[A] protectionist measure provides large benefits to a small number of people, and causes a very great number of consumers a slight loss. This circumstance makes it easier to put a protection measure into practice." Pareto 1927

## Two Related Themes

I. The persistence of inefficient conflict

- Incomplete Information: Myerson-Satterthwaite (1983), Fearon (1995), Esteban and Ray (2001), Bester and Warneryd (2006), Sánchez-Pagés (2008).
- Limited Commitment: Fearon (1995), Slantchev (2003), Garfinkel and Skaperdas (2000), Jackson and Morelli (2007), Powell (2007), Leventoglu and Slantchev (2007).
II. Multiple threats to peace
- salience of different markers
- geography, religion, occupation, caste, class ...
- our specific focus: small versus large groups.
- We show how group size in conflict is related to the nature of conflict payoffs.
- We emniricallv test our nredictions.


## Relationship to Last Lecture

■ In last lecture, I wrote down a model of conflict:

- assuming that the decision to participate in conflict has already been made
- In this lecture I study the participation decision explicitly
- But in a simpler setting.

A Model

- Set of individuals $[0,1]$.
- Contestable surplus $v$ to be allocated
- Important later just how the surplus is generated.
- Status-quo allocation: $\mathbf{x}=\{x(i)\}$ on $[0,1]$;
- $\int x(i) d i=v$.
- Group (ethnicity, class, religion, location ...)
- Comes from some given collection of subsets of $[0,1]$
- Can initiate conflict against its complement (the defender or "State").


## Conflict

- Initiator size $m$, defender size $\bar{m}(m+\bar{m}=1)$.
- per-capita prizes $\pi$ and $\bar{\pi}$.
- Winner gets to allocate prize the way they want.
- $v, \pi, \bar{\pi}$
- Initiator spends $r$ per capita, defender spends $\bar{r}$ per capita.
- $\operatorname{Cost} c(r)=(1 / \alpha) r^{\alpha}, \alpha>1$.
- Win probability $p=m r / R$, where $R=m r+\overline{m r}$.

■ Net payoff per capita $\pi \frac{m r}{R}-c(r)$.

- First-order condition for initiator:

$$
\pi\left[\frac{m}{R}-\frac{m^{2} r}{R^{2}}\right]=c^{\prime}(r)=r^{\alpha-1}
$$

- Payoff

$$
\pi \frac{m r}{R}-c(r) .
$$

- First-order condition for initiator:

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$$

- Payoff

$$
\pi \frac{m r}{R}-c(r) .
$$

- First-order condition for initiator:

$$
\pi m \bar{m}=R^{2} \frac{r^{\alpha-1}}{\bar{r}}
$$

- Likewise, for the defender:

$$
\bar{\pi} m \bar{m}=R^{2} \frac{\bar{r}^{\alpha-1}}{r}
$$

- So relative per-capita contribution by initiator is

$$
\frac{r}{\bar{r}}=\left(\frac{\pi}{\bar{\pi}}\right)^{1 / \alpha} \equiv \gamma
$$

- Now obtain a closed form for payoff.
- Manipulate first-order condition

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- Manipulate first-order condition

$$
\pi p \bar{p}=r^{\alpha}
$$

- So expected payoff from conflict given by

$$
\pi p-(1 / \alpha) r^{\alpha}
$$

■ Now obtain a closed form for payoff.

- Manipulate first-order condition

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$$
\pi p \bar{p}=r^{\alpha}
$$

- So expected payoff from conflict given by

$$
\pi p-(1 / \alpha) \pi p(1-p)
$$

■ Now obtain a closed form for payoff.

- Manipulate first-order condition

$$
\pi p \bar{p}=r^{\alpha}
$$

- So expected payoff from conflict given by

$$
\begin{aligned}
& \pi p-(1 / \alpha) \pi p(1-p) \\
& =\pi\left[k p+(1-k) p^{2}\right]
\end{aligned}
$$

where $k \equiv(\alpha-1) / \alpha \in(0,1)$.

- And the win probability $p$ is given by

$$
p=\frac{m r}{m r+(1-m) \bar{r}}
$$

■ Now obtain a closed form for payoff.

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- And the win probability $p$ is given by

$$
p=\frac{m(r / \bar{r})}{m(r / \bar{r})+(1-m)}=\frac{m \gamma}{m \gamma+(1-m)}
$$

where $\gamma=(r / \bar{r})=(\pi / \bar{\pi})^{1 / \alpha}$.

## Summary So Far

- Nash equilibrium of this game has three components:

1. Relative resource contribution:

$$
\gamma \equiv \frac{r}{\bar{r}}=\left(\frac{\pi}{\bar{\pi}}\right)^{1 / \alpha}
$$

2. Win probability for the group:

$$
p=\frac{m \gamma}{m \gamma+(1-m)}
$$

3. Expected per-capita payoff to group:

$$
\pi\left[k p+(1-k) p^{2}\right], \text { where } k \equiv \frac{\alpha-1}{\alpha} .
$$

## Threats to Peace

- A peaceful allocation $\mathbf{x} \in V$ is blocked if for some initiator $G$

$$
\pi\left[k p+(1-k) p^{2}\right]>\int_{G} x(i)
$$

- A society is
- Prone to conflict if the "unbiased" status quo $x(i)=v$ is blocked.
- Actively conflictual if every peaceful allocation, unbiased or not, is blocked.

Private Prize (total value $v$ so that $\pi=v / m$ and $\bar{\pi}=v / \bar{m}$ )

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Unbiased peacetime per-capita payoff: v

Proposition 1. There is $m^{*} \in(0,1 / 2)$ such that a society with groups of size $m<m^{*}$ will be conflict-prone.

■ Need $\frac{v}{m}\left[k p+(1-k) p^{2}\right]>v$, where $p=\frac{m^{k}}{m^{k}+(1-m)^{k}}$.

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■ Need $k p+(1-k) p^{2}>m$, where $p=\frac{m^{k}}{m^{k}+(1-m)^{k}}$.


- Of course, there is some allocation that will appease the initiator:
- after all, conflict is inefficient.
- But that allocation will need to vary with the potential threat.
- If there are several potential initiators, this could be hard.
- Formalize this idea:
- Balanced collection is finite set $\mathscr{C}$ of potential initiators:
- There are weights $\lambda(G) \in[0,1]$, one for each $G \in \mathscr{C}$, such that

$$
\sum_{G \in \mathscr{C}, i \in G} \lambda(G)=1 \text { for every } i \text { in society }
$$

## What Does Balancedness Mean?

- Essentially, that there are no central subgroups of individuals.
- Example: $\mathscr{C}$ only contains subgroups of society that contain $[0,1 / 2]$.
- Suppose there are "balancing weights" $\{\lambda(G)\}$.
- Then entire set of weights add to 1 :

$$
\sum_{G \in \mathscr{C}} \lambda(G)=1
$$

- Now pick any $G^{\prime}$ with $\lambda\left(G^{\prime}\right)>0$. There is $j \notin G^{\prime}$. So we must have

$$
\sum_{G \in \mathscr{C}, j \in G} \lambda(G)<1
$$

which contradicts balancedness.

## Proposition 2.

- Suppose there is a balanced collection $\mathscr{C}$ of initiators, each with $m<m^{*}$.
- Then society is actively conflictual.
- Proof. Suppose there is indeed a peaceful allocation $\mathbf{x}$.
- For every initiator $G \in \mathscr{C}$ of size $m_{G}$,

$$
\begin{aligned}
& \int_{i \in G} x(i) \geq v\left[k p\left(m_{G}\right)+(1-k) p\left(m_{G}\right)^{2}\right]>v m_{G} \\
& \text { [appeasement] } \quad\left[\mathbf{m}<\mathbf{m}^{*}\right]
\end{aligned}
$$

- So

$$
\int_{i \in N} x(i)=\sum_{G \in \mathscr{C}} \lambda(G) \int_{i \in G} x(i)>\sum_{G \in \mathscr{C}} \lambda(G) m_{G} v=v
$$

(changing order of summation and integrals). Contradiction.

Corollary.

- Suppose society can be partitioned into markers of size $m<m^{*}$.
- Then society is actively conflictual.
- Even stronger results possible.
- E.g. quadratic costs: then $m^{*}=1 / 4$.
- If $m=10 \%$, actively conflictual with six such pairwise disjoint groups.
- Yet not balanced.


## Public Goods

- Unit budget; can only be used to produce public goods 1-1.
- Several public goods, one (or one mix) for each group; e.g.:
- support of religion
- provision of public health care or education
- different weights on tariffs vs liberalization

■ Per-capita payoff from $G$-good: $\Psi$ if $i \in G, 0$ otherwise.

- This is stark but not needed.


## Monetizable Public Goods

- Peacetime. Pick any maximal group of size $m_{1}$; only produce that good.
- Make side-payments to everyone else.
- Overall worth $v$ equals $\Psi m_{1}$, fully TU.
- Conflict. If an initiator $G$ of size $m$ wins:
- uses budget to produce only the $G$-good.
- payoff per-capita $\pi=\Psi$.

■ If defender wins:

- produces for its largest group, say of size $m^{\prime}$.
- payoff per-capita $\bar{\pi}=\mu \Psi$, where $\mu=m^{\prime} /(1-m)$.

Proposition 3.

- Assume that the prize is public.
- Let $m_{1} \geq m_{2}$ be largest and second largest group sizes in society.
- Then society is conflict-prone if and only if

$$
m_{1}>\frac{1-\mu_{1}^{-1 / \alpha} k}{\left(\mu_{1}^{-1 / \alpha}-1\right)^{2}}
$$

where $\mu_{1}=m_{2} /\left(1-m_{1}\right)$.

- In this case, the largest group prefers conflict to unbiased allocation.
- Condition more likely to hold when $\mu_{1}=m_{2} /\left(1-m_{1}\right)$ is small.
- One large group with a relatively fragmented opposition.
- E.g., if there are two groups, condition never holds.


## Conflict-Proneness

- Largest group $\left(m_{1}\right)$ vs share of second group in remainder $\left(m_{2} /\left(1-m_{1}\right)\right)$



## Arbitrary Peacetime Allocations and Active Conflict

- Illustration.
- Society is partitioned into $M \geq 2$ groups. each of equal size.
- Claim. There is a unique $\hat{M}$, such that

$$
(M-1)^{1-k}-2>(M-1)^{k}-k M
$$

iff $M \geq \hat{M}$. Note: $\hat{M} \geq 3$.

Proposition 4.

- Suppose that $M \geq \hat{M}$. Then a society partitioned into potential initiators of equal size is actively conflictual.
- Proof: simply verify the conflict-proneness condition for $M \geq \hat{M}$ :

$$
\frac{1}{M}>\frac{1-(M-1)^{1 / \alpha} k}{\left[(M-1)^{1 / \alpha}-1\right]^{2}}
$$

Non-Transferability and Public Prizes

- Public goods are not like oil revenues.
- Think of ethnic or religious representation, or the sharing of political power.
- May be impossible to conceive of "compensating" financial transfers.
- No sidepayments. Allocate the budget to different goods.



## Limited Transferability

- Two groups of size $m_{1}$ and $1-m_{1}$.
- Say $\sigma \in(0,1)$ of the budget freely allocated using financial transfers.
- Remainder can only be "transferred" by reallocating the budget.
- Unbiased peacetime payoff per person is given by

$$
\Psi\left[\sigma m_{1}+(1-\sigma) \frac{1}{2}\right]
$$

where $m_{1}$, as before, is the size of the larger group.

- If only budget transferability, payoff drops to $\Psi / 2$ (as opposed to $\Psi m_{1}$ with financial transfers).


## Proposition 5.

- Public prize, limited transferability ( $\sigma$ ), two groups.
- Then there is $m^{*}(\sigma) \in(0.5,1)$ such that society is conflict-prone if and only if $m_{1} \geq m^{*}(\boldsymbol{\sigma})$.

■ Note. $m^{*}(\sigma) \rightarrow 1$ as $\sigma \rightarrow 1$.

- Examples:
- Two groups, quadratic cost, $\sigma=0, m_{1}>61.8 \%$.
- Three groups, $\sigma=0, \alpha=1.2, m_{1}>39.7 \%$.
- The intuition that larger groups matter continues to hold.


## Empirics

## Groups and Conflict

■ Geo-referenced ethnic groups (GREG); Weidman, Rod and Cederman 2010.
digitized version of Atlas Narodov Mira 1964.

- 145 countries, homelands of 929 ethnic groups as in ANM 1964

Split by country: 1475 group-country units.

- Our study runs from 1960-2006, but homelands are fixed as in ANM 1964.

■ Group-level conflict data from Cederman, Buhaug and Rod 2009.

- Subset of UCDP/PRIO Armed Conflict Dataset.
- Incidence: armed conflict against State with 25+ battle deaths.
- Onset: if armed conflict against State with 25+ deaths starts that year


## Prizes:

■ Private prize. Based on oil availability in ethnic homeland:

- $\ln \left(\right.$ ethnic homeland area covered by oil $\left.{ }^{\prime} 000 \mathrm{~km}^{2}\right) \times$ international oil price.
- Merges GREG with geo-ref'd PETRODATA; Lujala, Rod and Thieme 2007.
- Robustness: land, minerals.

■ Public prize. Autocracy index from Polity IV: "derived from codings of the competitiveness of political participation, the regulation of participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive."

- Use pre-sample information exclusively.
- Robustness:
- Other measures of publicness: exclusion, religious freedoms, EMR (2012)
- Everything not private (as defined above) is public: more on this later.
- Country and time fixed effects throughout
- Population and population density
- Existence of diamond mines
- Mountainous terrain
- Group's distance to country capital
- Number of years since last group-level onset
- Lagged conflict incidence
- GDP per capita
- Whether the ethnic group is represented in power
- Whether the ethnic group is partitioned across countries


## Specification

■ Baseline: $\operatorname{INCIDENCE~}_{c, g, t}=\beta_{1} \operatorname{SIZE}_{c, g}+\beta_{2} \operatorname{SIZE}_{c, g} \times \mathrm{OIL}_{c, g, t}+\beta_{3} \mathrm{OIL}_{c, g, t}$

$$
+\beta_{4} \mathrm{SIZE}_{c, g} \times \mathrm{AUTOC}_{c}+X_{c, g, t}^{\prime} \alpha+Y_{c, t}^{\prime} \delta+Z_{c}^{\prime} \gamma+W_{t}^{\prime} \eta+\varepsilon_{c, g, t},
$$

- for countries $c=1, \ldots, C$, groups $g=1, \ldots, G_{c}$, and dates $t=1, \ldots, T$.
- Prediction: (narrow view of public goods): $\beta_{2}<0, \beta_{3}>0$.
- ("anything not private is public"): $\beta_{2}<0$, and $\beta_{1}>0$ when we impose $\beta_{4}=0$.
- linear probability model

Interpreting interactions in other models nontrivial; Ai and Norton 2003. statistical conclusions still valid for nonlinear models. robust standard errors clustered at the group level.


|  | Group Size and Conflict Incidence |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | $\begin{gathered} -0.002 \\ (0.307) \end{gathered}$ | $\begin{array}{r} 0.003 \\ (0.101) \end{array}$ | $\begin{array}{r} 0.007 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.007 * * * \\ (0.001) \end{array}$ | $-0.003$ <br> (0.116) | $\begin{array}{r} -0.005^{*} * \\ (0.014) \end{array}$ | $\begin{array}{r} -0.002 \\ (0.328) \end{array}$ | $\begin{array}{r} 0.003 \\ (0.156) \end{array}$ |
| OIL | $\begin{gathered} 0.448 * * \\ (0.040) \end{gathered}$ | $\begin{array}{r} 0.684 * * * \\ (0.009) \end{array}$ | $\begin{array}{r} 0.830 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.795 * * * \\ (0.008) \end{array}$ |  | $0.446^{* *}$ (0.040) | $\begin{array}{r} 0.606 * * \\ (0.012) \end{array}$ | $\begin{gathered} 0.762 * * \\ (0.010) \end{gathered}$ |
| SIZE $\times$ OIL | (0.040) | -1.363*** | -1.528*** | -1.521*** |  | (0.040) | (0.012) | -1.390*** |
|  |  | (0.000) | (0.000) | (0.000) |  |  |  | (0.000) |
| SIZE $\times$ AUTOC |  |  |  |  | $\begin{array}{r} 0.008 * * \\ (0.012) \end{array}$ | $\begin{gathered} 0.008^{* *} \\ (0.011) \end{gathered}$ | $\begin{array}{r} 0.009 * * * \\ (0.006) \end{array}$ | $\begin{array}{r} 0.009 * * \\ (0.015) \end{array}$ |
| GIP |  |  | $\begin{array}{r} -0.003 * * \\ (0.033) \end{array}$ | $\begin{gathered} -0.003 * \\ (0.057) \end{gathered}$ |  |  | $\begin{array}{r} -0.003 * * \\ (0.040) \end{array}$ | $\begin{gathered} -0.003^{*} \\ (0.057) \end{gathered}$ |
| GROUPAREA |  |  | $\begin{array}{r} 0.000 \\ (0.369) \end{array}$ | $\begin{array}{r} 0.000 \\ (0.214) \end{array}$ |  |  | $\begin{gathered} -0.000 \\ (0.543) \end{gathered}$ | $\begin{array}{r} 0.000 \\ (0.219) \end{array}$ |
| SOILCONST |  |  | $\begin{aligned} & -0.001 * \\ & (0.097) \end{aligned}$ | $\begin{array}{r} -0.000 \\ (0.518) \end{array}$ |  |  | $\begin{array}{r} -0.000 \\ (0.152) \end{array}$ | $\begin{gathered} -0.000 \\ (0.472) \end{gathered}$ |
| DISTCAP |  |  | $\begin{array}{r} 0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.002 * * * \\ (0.000) \end{array}$ |  |  | $\begin{array}{r} 0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.002 * * * \\ (0.000) \end{array}$ |
| MOUNT |  |  | $\begin{aligned} & 0.002 * \\ & (0.080) \end{aligned}$ | $\begin{array}{r} 0.002 \\ (0.111) \end{array}$ |  |  | $\begin{array}{r} 0.002 \\ (0.109) \end{array}$ | $\begin{array}{r} 0.002 \\ (0.130) \end{array}$ |
| PARTITIONED |  |  | $\begin{gathered} -0.001 \\ (0.553) \end{gathered}$ | $\begin{array}{r} -0.001 \\ (0.288) \end{array}$ |  |  | $\begin{gathered} -0.001 \\ (0.487) \end{gathered}$ | $\begin{array}{r} -0.001 \\ (0.243) \end{array}$ |
| GDP |  |  |  | $\begin{array}{r} 0.001 \\ (0.140) \end{array}$ |  |  |  | $\begin{array}{r} 0.003 * * * \\ (0.006) \end{array}$ |
| POP |  |  |  | $\begin{array}{r} 0.001 \\ (0.556) \end{array}$ |  |  |  | $\begin{array}{r} 0.001 \\ (0.710) \end{array}$ |
| LAG | $\begin{array}{r} 0.895 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.895 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.894 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.893 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.899 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.899 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.898 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.898 * * * \\ (0.000) \end{array}$ |
| c | $\begin{aligned} & -0.002 \\ & (0.207) \end{aligned}$ | $\begin{array}{r} -0.005 * * * \\ (0.006) \end{array}$ | $\begin{array}{r} -0.009 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.034 \\ (0.411) \end{array}$ | $\begin{array}{r} 0.011 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.013 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.010 * * * \\ (0.001) \end{array}$ | $\begin{aligned} & -0.041 \\ & (0.319) \end{aligned}$ |
| $\mathrm{R}^{2}$ | 0.844 | 0.844 | 0.844 | 0.846 | 0.849 | 0.849 | 0.849 | 0.851 |
| Obs | 64839 | 64839 | 64839 | 57559 | 62650 | 62650 | 62650 | 55383 |


|  | Group Size and Conflict Incidence |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | -0.002 | 0.003 | $0.007 * * *$ | $0.007 * * *$ | $-0.003$ | $-0.005 * *$ | -0.002 | 0.003 |
|  | (0.307) | (0.101) | (0.001) | $(0.001)$ | $(0.116)$ | (0.014) | (0.328) | (0.156) |
| OIL | 0.448** | 0.684*** | 0.830*** | $0.795 * * *$ |  | 0.446** | 0.606** | 0.762** |
|  | (0.040) | (0.009) | (0.002) | (0.008) |  | (0.040) | (0.012) | (0.010) |
| SIZE $\times$ OIL |  | -1.363*** | -1.528*** | -1.521*** |  |  |  | -1.390*** |
|  |  | (0.000) | (0.000) | (0.000) |  |  |  | (0.000) |
| SIZE $\times$ AUTOC |  |  |  |  | 0.008** | 0.008** | 0.009*** | 0.009** |
|  |  |  |  |  | (0.012) | (0.011) | (0.006) | (0.015) |
| GIP |  |  | -0.003** | -0.003* |  |  | -0.003** | -0.003* |
|  |  |  | (0.033) | (0.057) |  |  | (0.040) | (0.057) |
| GROUPAREA |  |  | 0.000 | 0.000 |  |  | -0.000 | 0.000 |
|  |  |  | (0.369) | (0.214) |  |  | (0.543) | (0.219) |
| SOILCONST |  |  | -0.001* | -0.000 |  |  | -0.000 | -0.000 |
|  |  |  | (0.097) | (0.518) |  |  | (0.152) | (0.472) |
| DISTCAP |  |  | 0.001*** | $0.002 * * *$ |  |  | 0.001*** | 0.002*** |
|  |  |  | (0.000) | (0.000) |  |  | (0.000) | (0.000) |
| MOUNT |  |  | 0.002* | 0.002 |  |  | 0.002 | 0.002 |
|  |  |  | (0.080) | (0.111) |  |  | (0.109) | (0.130) |
| PARTITIONED |  |  | -0.001 | -0.001 |  |  | -0.001 | -0.001 |
|  |  |  | (0.553) | (0.288) |  |  | (0.487) | (0.243) |
| GDP |  |  |  | 0.001 |  |  |  | 0.003 *** |
|  |  |  |  | (0.140) |  |  |  | (0.006) |
| POP |  |  |  | 0.001 |  |  |  | 0.001 |
|  |  |  |  | (0.556) |  |  |  | (0.710) |
| LAG | 0.895*** | 0.895*** | 0.894*** | 0.893*** | 0.899*** | 0.899*** | 0.898*** | 0.898*** |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| c | -0.002 | -0.005*** | $-0.009^{* * *}$ | -0.034 | 0.011*** | 0.013*** | 0.010*** | -0.041 |
|  | (0.207) | (0.006) | (0.000) | (0.411) | (0.000) | (0.000) | (0.001) | (0.319) |
| $\mathrm{R}^{2}$ | 0.844 | 0.844 | 0.844 | 0.846 | 0.849 | 0.849 | 0.849 | 0.851 |
| Obs | 64839 | 64839 | 64839 | 57559 | 62650 | 62650 | 62650 | 55383 |


|  | Group Size and Conflict Incidence |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | -0.002 | 0.003 | 0.007*** | 0.007*** | -0.003 | -0.005** | -0.002 | 0.003 |
|  | (0.307) | (0.101) | (0.001) | (0.001) | (0.116) | (0.014) | (0.328) | (0.156) |
| OIL | 0.448** | 0.684*** | 0.830*** | 0.795*** |  | 0.446** | 0.606** | 0.762** |
|  | (0.040) | (0.009) | (0.002) | (0.008) |  | (0.040) | (0.012) | (0.010) |
| SIZE $\times$ OIL |  | $-1.363^{* * *}$ | -1.528*** | -1.521*** |  |  |  | -1.390*** |
|  |  | (0.000) | (0.000) | (0.000) |  |  |  | (0.000) |
| SIZE $\times$ AUTOC |  |  |  |  | 0.008** | 0.008** | 0.009*** | 0.009** |
|  |  |  |  |  | (0.012) | (0.011) | (0.006) | (0.015) |
| GIP |  |  | -0.003** | -0.003* |  |  | -0.003** | -0.003* |
|  |  |  | (0.033) | (0.057) |  |  | (0.040) | (0.057) |
| GROUPAREA |  |  | 0.000 | 0.000 |  |  | -0.000 | 0.000 |
|  |  |  | (0.369) | (0.214) |  |  | (0.543) | (0.219) |
| SOILCONST |  |  |  |  |  |  | $-0.000$ | -0.000 |
|  |  |  | (0.097) | $(0.518)$ |  |  | (0.152) | (0.472) |
| DISTCAP |  |  | 0.001*** | 0.002*** |  |  | $0.001 * * *$ | $0.002 * * *$ |
|  |  |  | (0.000) | (0.000) |  |  | (0.000) | (0.000) |
| MOUNT |  |  | 0.002* | 0.002 |  |  | 0.002 | 0.002 |
|  |  |  | (0.080) | (0.111) |  |  | (0.109) | (0.130) |
| PARTITIONED |  |  | $-0.001$ | $-0.001$ |  |  | -0.001 | $-0.001$ |
|  |  |  | $(0.553)$ | $(0.288)$ |  |  | (0.487) | $(0.243)$ |
| GDP |  |  |  | 0.001 |  |  |  | 0.003*** |
|  |  |  |  | $(0.140)$ |  |  |  | $(0.006)$ |
| POP |  |  |  | 0.001 |  |  |  | 0.001 |
|  |  |  |  | (0.556) |  |  |  | (0.710) |
| LAG |  |  |  |  |  |  |  |  |
|  | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| c | -0.002 | $-0.005^{* * *}$ | $-0.009 * * *$ | -0.034 | 0.011*** | 0.013*** | 0.010*** | -0.041 |
|  | (0.207) | $(0.006)$ | (0.000) | $(0.411)$ | (0.000) | (0.000) | (0.001) | (0.319) |
| $\mathrm{R}^{2}$ | 0.844 | 0.844 | 0.844 | 0.846 | 0.849 | 0.849 | 0.849 | 0.851 |
| Obs | 64839 | 64839 | 64839 | 57559 | 62650 | 62650 | 62650 | 55383 |

## Magnitudes

- Set autoc low, and OIL high:
- Group size $\uparrow 1$ SD $\Rightarrow$ incidence $\downarrow$ by $4.2 \%$ (onset $\downarrow 23.2 \%$ )
- Set AUTOC high, and OIL low:
- Group size $\uparrow 1 \mathrm{SD} \Rightarrow$ incidence $\uparrow$ by $9.5 \%$ (onset $\uparrow 69.8 \%$ )



## Variations

- Alternative measures of conflict
- Other proxies for the private prize
- Other proxies for the public prize
- Group- (rather than country-) fixed effects
- Alternative estimation strategies (logit)
- Coalitions across ethnic groups
- Clustering of errors at the country and at the country-group level
- Robustness to dropping different regions of the world
- Potential confounding role of ethnic fractionalization and polarization.

|  | Group Size and Conflict Onset |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | $\begin{array}{r} -0.001 \\ (0.333) \end{array}$ | $\begin{gathered} 0.003 * * \\ (0.025) \end{gathered}$ | $\begin{array}{r} 0.005 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.005 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} -0.000 \\ (0.853) \end{array}$ | $\begin{array}{r} -0.001 \\ (0.668) \end{array}$ | $\begin{gathered} \hline-0.001 \\ (0.668) \end{gathered}$ | $\begin{aligned} & 0.003 * \\ & (0.053) \end{aligned}$ |
| OIL | $\begin{array}{r} 0.652 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.870 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.966 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.937 * * * \\ (0.001) \end{array}$ |  | $\begin{array}{r} 0.791 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.791 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.957 * * * \\ (0.001) \end{array}$ |
| SIZE $\times$ OIL |  | $\begin{array}{r} -1.221 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -1.171 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -1.149 * * * \\ (0.000) \end{array}$ |  |  |  | $\begin{array}{r} -1.079 * * * \\ (0.000) \end{array}$ |
| SIZE $\times$ AUTOC |  |  |  |  | $\begin{aligned} & 0.005^{*} \\ & (0.052) \end{aligned}$ | $\begin{gathered} 0.006 * * \\ (0.043) \end{gathered}$ | $\begin{gathered} 0.006 * * \\ (0.043) \end{gathered}$ | $\begin{aligned} & 0.005^{*} \\ & (0.069) \end{aligned}$ |
| GIP |  |  | $\begin{gathered} -0.002 * \\ (0.076) \end{gathered}$ | $\begin{gathered} -0.002 * \\ (0.078) \end{gathered}$ |  | $\begin{array}{r} -0.002 \\ (0.100) \end{array}$ | $\begin{gathered} -0.002 \\ (0.100) \end{gathered}$ | $\begin{gathered} -0.002 * \\ (0.092) \end{gathered}$ |
| GROUPAREA |  |  | $\begin{array}{r} -0.000 \\ (0.376) \end{array}$ | $\begin{gathered} -0.000 \\ (0.659) \end{gathered}$ |  | $\begin{gathered} -0.000^{*} \\ (0.074) \end{gathered}$ | $\begin{gathered} -0.000^{*} \\ (0.074) \end{gathered}$ | $\begin{gathered} -0.000 \\ (0.613) \end{gathered}$ |
| SOILCONST |  |  | $\begin{aligned} & -0.000 \\ & (0.102) \end{aligned}$ | $\begin{aligned} & -0.000 \\ & (0.479) \end{aligned}$ |  | $\begin{aligned} & -0.000 \\ & (0.603) \end{aligned}$ | $\begin{array}{r} -0.000 \\ (0.603) \end{array}$ | $\begin{array}{r} -0.000 \\ (0.466) \end{array}$ |
| DISTCAP |  |  | $\begin{array}{r} 0.001 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.001 * * * \\ (0.003) \end{array}$ |  | $\begin{array}{r} 0.001 * * * \\ (0.005) \end{array}$ | $\begin{array}{r} 0.001 * * * \\ (0.005) \end{array}$ | $\begin{array}{r} 0.001 * * * \\ (0.004) \end{array}$ |
| MOUNT |  |  | $\begin{gathered} 0.002^{* *} \\ (0.017) \end{gathered}$ | $\begin{array}{r} 0.002 * * \\ (0.048) \end{array}$ |  | $\begin{aligned} & 0.002^{*} \\ & (0.063) \end{aligned}$ | $\begin{aligned} & 0.002 * \\ & (0.063) \end{aligned}$ | $\begin{aligned} & 0.002 * \\ & (0.055) \end{aligned}$ |
| PARTITIONED |  |  | $\begin{array}{r} -0.000 \\ (0.716) \end{array}$ | $\begin{array}{r} -0.001 \\ (0.407) \end{array}$ |  | $\begin{array}{r} -0.001 \\ (0.340) \end{array}$ | $\begin{array}{r} -0.001 \\ (0.340) \end{array}$ | $\begin{gathered} -0.001 \\ (0.328) \end{gathered}$ |
| GDP |  |  |  | $\begin{array}{r} 0.001 \\ (0.301) \end{array}$ |  | $\begin{gathered} 0.002 * * \\ (0.041) \end{gathered}$ | $\begin{array}{r} 0.002 * * \\ (0.041) \end{array}$ | $\begin{array}{r} 0.002 * * \\ (0.045) \end{array}$ |
| POP |  |  |  | $\begin{array}{r} 0.002 \\ (0.263) \end{array}$ |  | $\begin{array}{r} 0.002 \\ (0.206) \end{array}$ | $\begin{array}{r} 0.002 \\ (0.206) \end{array}$ | $\begin{array}{r} 0.002 \\ (0.237) \end{array}$ |
| PEACEYRS | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001^{* * *} \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ |
| c | $\begin{array}{r} 0.070 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.067 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.012 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.009 \\ (0.795) \end{array}$ | $\begin{array}{r} 0.039 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.016 \\ (0.520) \end{array}$ | $\begin{array}{r} -0.016 \\ (0.520) \end{array}$ | $\begin{array}{r} -0.012 \\ (0.618) \end{array}$ |
| $\mathrm{R}^{2}$ | 0.030 | 0.031 | 0.031 | 0.033 | 0.032 | 0.034 | 0.034 | 0.034 |
|  |  |  | Grou | Size an | Conflict | nset |  |  |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | -0.001 | 0.003** | 0.005*** | 0.005*** | -0.000 | -0.001 | -0.001 | 0.003* |
|  | (0.333) | (0.025) | (0.001) | (0.001) | (0.853) | (0.668) | (0.668) | (0.053) |
| OIL | $\begin{array}{r} 0.652 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.870^{* * *} \\ (0.001) \end{array}$ | $\begin{array}{r} 0.966 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.937 * * * \\ (0.001) \end{array}$ |  | $\begin{array}{r} 0.791 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.791 * * * \\ (0.002) \end{array}$ | $\begin{array}{r} 0.957 * * * \\ (0.001) \end{array}$ |
| SIZE $\times$ OIL |  | -1.221*** | -1.171*** | -1.149*** |  |  |  | -1.079*** |
|  |  | (0.000) | (0.000) | (0.000) |  |  |  | (0.000) |
| SIZE $\times$ AUTOC |  |  |  |  | 0.005* | 0.006** | 0.006** | 0.005* |
| GIP |  |  | $\begin{gathered} -0.002 * \\ (0.076) \end{gathered}$ | $\begin{gathered} -0.002 * \\ (0.078) \end{gathered}$ | (0.052) | $\begin{gathered} \hline(0.043) \\ -0.002 \\ (0.100) \end{gathered}$ | $\begin{gathered} \hline(0.043) \\ -0.002 \\ (0.100) \end{gathered}$ | $\begin{gathered} (0.069) \\ -0.002^{*} \\ (0.092) \end{gathered}$ |
| GROUPAREA |  |  | $\begin{array}{r} -0.000 \\ (0.376) \end{array}$ | $\begin{array}{r} -0.000 \\ (0.659) \end{array}$ |  | $\begin{gathered} -0.000^{*} \\ (0.074) \end{gathered}$ | $\begin{gathered} -0.000^{*} \\ (0.074) \end{gathered}$ | $\begin{array}{r} -0.000 \\ (0.613) \end{array}$ |
| SOILCONST |  |  | $\begin{array}{r} -0.000 \\ (0.102) \end{array}$ | $\begin{array}{r} -0.000 \\ (0.479) \end{array}$ |  | $\begin{aligned} & -0.000 \\ & (0.603) \end{aligned}$ | $\begin{gathered} -0.000 \\ (0.603) \end{gathered}$ | $\begin{array}{r} -0.000 \\ (0.466) \end{array}$ |
| DISTCAP |  |  | $\begin{array}{r} 0.001 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.001 * * * \\ (0.003) \end{array}$ |  | $\begin{array}{r} 0.001 * * * \\ (0.005) \end{array}$ | $\begin{array}{r} 0.001 * * * \\ (0.005) \end{array}$ | $\begin{array}{r} 0.001^{* * *} \\ (0.004) \end{array}$ |
| MOUNT |  |  | $\begin{array}{r} 0.002 * * \\ (0.017) \end{array}$ | $\begin{gathered} 0.002 * * \\ (0.048) \end{gathered}$ |  | $\begin{aligned} & 0.002 * \\ & (0.063) \end{aligned}$ | $\begin{aligned} & 0.002^{*} \\ & (0.063) \end{aligned}$ | $\begin{aligned} & 0.002 * \\ & (0.055) \end{aligned}$ |
| PARTITIONED |  |  | $\begin{array}{r} -0.000 \\ (0.716) \end{array}$ | $\begin{gathered} -0.001 \\ (0.407) \end{gathered}$ |  | $\begin{array}{r} -0.001 \\ (0.340) \end{array}$ | $\begin{array}{r} -0.001 \\ (0.340) \end{array}$ | $\begin{array}{r} -0.001 \\ (0.328) \end{array}$ |
| GDP |  |  |  | $\begin{array}{r} 0.001 \\ (0.301) \end{array}$ |  | $\begin{gathered} 0.002 * * \\ (0.041) \end{gathered}$ | $\begin{gathered} 0.002 * * \\ (0.041) \end{gathered}$ | $\begin{gathered} 0.002 * * \\ (0.045) \end{gathered}$ |
| POP |  |  |  | $\begin{array}{r} 0.002 \\ (0.263) \end{array}$ |  | $\begin{array}{r} 0.002 \\ (0.206) \end{array}$ | $\begin{array}{r} 0.002 \\ (0.206) \end{array}$ | $\begin{array}{r} 0.002 \\ (0.237) \end{array}$ |
| PEACEYRS | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -0.001^{* * *} \\ (0.000) \end{array}$ |
| c | $\begin{array}{r} 0.070 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} 0.067^{* * *} \\ (0.000) \end{array}$ | $\begin{array}{r} 0.012 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.009 \\ (0.795) \end{array}$ | $\begin{array}{r} 0.039 * * * \\ (0.000) \end{array}$ | $\begin{gathered} -0.016 \\ (0.520) \end{gathered}$ | $\begin{array}{r} -0.016 \\ (0.520) \end{array}$ | $\begin{array}{r} -0.012 \\ (0.618) \end{array}$ |
| $\mathrm{R}^{2}$ | 0.030- | 0.031 | 0.031 | 0.033 | 0.032 | 0.034 | 0.034 | 0.034 |

Variations in the Private Prize

Oil Alternatives and Land Abundance

|  | [1] | [2] | [3] | [4] | [5] | [6] |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| SIZE | $\begin{array}{r} * * * 0.006 \\ (0.004) \end{array}$ | $\begin{array}{r} 0.002 \\ (0.338) \end{array}$ | $\begin{array}{r} * * * 0.005 \\ (0.009) \end{array}$ | $\begin{array}{r} 0.001 \\ (0.647) \end{array}$ | $\begin{gathered} * * * 0.018 \\ (0.003) \end{gathered}$ | $\begin{gathered} * * * 0.015 \\ (0.005) \end{gathered}$ |
| OIL(AREA) | $\begin{gathered} * * 0.002 \\ (0.012) \end{gathered}$ | $\begin{gathered} * * 0.002 \\ (0.019) \end{gathered}$ |  |  |  |  |
| SIZE $\times$ OIL (AREA) | $\begin{array}{r} * * *-0.003 \\ (0.001) \end{array}$ | $\begin{array}{r} * * *-0.003 \\ (0.003) \end{array}$ |  |  |  |  |
| OIL(SHARE) |  |  | $\begin{aligned} & * 0.010 \\ & (0.078) \end{aligned}$ | $\begin{aligned} & * 0.010 \\ & (0.087) \end{aligned}$ |  |  |
| SIZE $\times$ OIL (SHARE) |  |  | $\begin{array}{r} * *-0.021 \\ (0.019) \end{array}$ | $\begin{aligned} & *-0.016 \\ & (0.057) \end{aligned}$ |  |  |
| AREA(SHARE) |  |  |  |  | $\begin{array}{r} * * 0.021 \\ (0.032) \end{array}$ | $\begin{gathered} * * 0.021 \\ (0.043) \end{gathered}$ |
| SIZE $\times$ AREA (SHARE) |  |  |  |  | $\begin{array}{r} * * *-0.042 \\ (0.000) \end{array}$ | $\begin{array}{r} * * *-0.040 \\ (0.000) \end{array}$ |
| SIZE $\times$ AUTOC |  | $\begin{array}{r} * * 0.009 \\ (0.018) \end{array}$ |  | $\begin{gathered} * * 0.010 \\ (0.011) \end{gathered}$ |  | $\begin{aligned} & * 0.007 \\ & (0.063) \end{aligned}$ |
| CONTROLS, LAG | Y | Y | Y | Y | Y | Y |
| $\mathrm{R}^{2}$ | 0.846 | 0.851 | 0.846 | 0.851 | 0.846 | 0.851 |
| Obs | 57559 | 55383 | 57559 | 55383 | 56756 | 54580 |

Variations in the Private Prize

|  | Oil Alternatives and Land Abundance |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] |
| SIZE | ***0.006 | 0.002 | ***0.005 | 0.001 | ***0.018 | ***0.015 |
|  | (0.004) | (0.338) | (0.009) | (0.647) | (0.003) | (0.005) |
| Oil(area) | **0.002 | **0.002 |  |  |  |  |
|  | (0.012) | (0.019) |  |  |  |  |
| SIZE $\times$ OIL(AREA) | ***-0.003 | ***-0.003 |  |  |  |  |
| OIL(SHARE) | (0.001) | (0.003) |  |  |  |  |
|  |  |  | *0.010 | *0.010 |  |  |
|  |  |  | (0.078) | (0.087) |  |  |
| SIZE $\times$ OIL(SHARE) |  |  | **-0.021 | *-0.016 |  |  |
| AREA(SHARE) |  |  | (0.019) | (0.057) |  |  |
|  |  |  |  |  | **0.021 | **0.021 |
|  |  |  |  |  | (0.032) | (0.043) |
| SIZE $\times$ AREA (SHARE) |  |  |  |  | ***-0.042 | ***-0.040 |
|  |  |  |  |  | (0.000) | (0.000) |
| SIZE $\times$ AUTOC |  | **0.009 |  | **0.010 |  | *0.007 |
|  |  | (0.018) |  | (0.011) |  | (0.063) |
| CONTROLS, LAG | Y | Y | Y | Y | Y | Y |
| $\mathrm{R}^{2}$ | 0.846 | 0.851 | 0.846 | 0.851 | 0.846 | 0.851 |
| Obs | 57559 | 55383 | 57559 | 55383 | 56756 | 54580 |

More Variations in the Private Prize

|  | Minerals |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | $\begin{gathered} * * 0.007 \\ (0.020) \end{gathered}$ | $\begin{array}{r} 0.003 \\ (0.349) \end{array}$ | $\begin{gathered} * * 0.008 \\ (0.015) \end{gathered}$ | $\begin{array}{r} 0.004 \\ (0.269) \end{array}$ | $\begin{gathered} \hline * * 0.007 \\ (0.022) \end{gathered}$ | $\begin{array}{r} 0.003 \\ (0.378) \end{array}$ | $\begin{gathered} * * 0.008 \\ (0.016) \end{gathered}$ | $\begin{array}{r} 0.004 \\ (0.290) \end{array}$ |
| mines | $\begin{array}{r} 0.000 \\ (0.830) \end{array}$ | $\begin{array}{r} 0.000 \\ (0.881) \end{array}$ |  |  |  |  |  |  |
| SIZE $\times$ MINES | $\begin{array}{r} -0.002 * * \\ (0.021) \end{array}$ | $\begin{array}{r} -0.001^{* *} \\ (0.049) \end{array}$ |  |  |  |  |  |  |
| MINES+OIL |  |  | $\begin{array}{r} 0.000 \\ (0.592) \end{array}$ | $\begin{array}{r} 0.000 \\ (0.635) \end{array}$ |  |  |  |  |
| SIZE $\times$ MINES + OIL |  |  | $\begin{array}{r} -0.002 * * \\ (0.012) \end{array}$ | $\begin{array}{r} -0.002 * * \\ (0.029) \end{array}$ |  |  |  |  |
| MINES(UNWEIGH.) |  |  |  |  | $\begin{array}{r} 0.000 \\ (0.862) \end{array}$ | $\begin{array}{r} 0.000 \\ (0.909) \end{array}$ |  |  |
| SIZE $\times$ MINES(UNWEIGH.) |  |  |  |  | $\begin{array}{r} -0.001 * * \\ (0.023) \end{array}$ | $\begin{gathered} -0.001^{*} \\ (0.056) \end{gathered}$ |  |  |
| MINES+OIL(UNWEIGH.) |  |  |  |  |  |  | $\begin{array}{r} 0.000 \\ (0.625) \end{array}$ | $\begin{array}{r} 0.000 \\ (0.666) \end{array}$ |
| SIZE $\times$ MINES+OIL(UNWEIGH.) |  |  |  |  |  |  | $\begin{array}{r} -0.002 * * \\ (0.013) \end{array}$ | $\begin{array}{r} -0.001^{* *} \\ (0.033) \end{array}$ |
| SIZE $\times$ AUTOC |  | $\begin{gathered} 0.009 * * \\ (0.029) \end{gathered}$ |  | $\begin{gathered} 0.008 * * \\ (0.037) \end{gathered}$ |  | $\begin{gathered} 0.009 * * \\ (0.030) \end{gathered}$ |  | $\begin{array}{r} 0.008 * * \\ (0.038) \end{array}$ |
| $\mathrm{R}^{2}$ | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 |
| Obs | 35265 | 34887 | 35265 | 34887 | 35265 | 34887 | 35265 | 34887 |

## More Variations in the Private Prize

|  | Minerals |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
| SIZE | **0.007 | 0.003 | **0.008 | 0.004 | **0.007 | 0.003 | **0.008 | 0.004 |
|  | (0.020) | (0.349) | (0.015) | (0.269) | (0.022) | (0.378) | (0.016) | (0.290) |
| mines | 0.000 | 0.000 |  |  |  |  |  |  |
|  | (0.830) | (0.881) |  |  |  |  |  |  |
| SIZE $\times$ MINES | -0.002** | -0.001** |  |  |  |  |  |  |
| MINES+OIL | (0.021) | (0.049) |  |  |  |  |  |  |
|  |  |  | $\begin{array}{r} 0.000 \\ (0.592) \end{array}$ | $\begin{array}{r} 0.000 \\ (0.635) \end{array}$ |  |  |  |  |
| SIZE $\times$ MINES + OIL |  |  | -0.002** | -0.002** |  |  |  |  |
|  |  |  | (0.012) | (0.029) |  |  |  |  |
| MINES(UNWEIGH.) |  |  |  |  | 0.000 | 0.000 |  |  |
|  |  |  |  |  | (0.862) | (0.909) |  |  |
| SIZE $\times$ MINES(UNWEIGH.) |  |  |  |  | -0.001** | -0.001* |  |  |
|  |  |  |  |  | (0.023) | (0.056) |  |  |
| MINES+OIL(UNWEIGH.) |  |  |  |  |  |  | 0.000 | 0.000 |
|  |  |  |  |  |  |  | $(0.625)$ | (0.666) |
| SIZE $\times$ MINES+OIL(UNWEIGH.) |  |  |  |  |  |  | -0.002** | -0.001** |
|  |  |  |  |  |  |  | (0.013) | (0.033) |
| SIZE $\times$ AUTOC |  | 0.009** |  | 0.008** |  | 0.009** |  | 0.008** |
|  |  | (0.029) |  | (0.037) |  | (0.030) |  | (0.038) |
| $\mathrm{R}^{2}$ | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 | 0.836 |
| Obs | 35265 | 34887 | 35265 | 34887 | 35265 | 34887 | 35265 | 34887 |

## Variations in the Public Prize

|  | Exclusion, EMR Measure, Religious Freedoms |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] |
| SIZE | $\begin{array}{r} -0.000 \\ (0.985) \end{array}$ | $\begin{array}{r} 0.007 * * * \\ (0.001) \end{array}$ | $\begin{array}{r} 0.003 \\ (0.337) \end{array}$ | $\begin{array}{r} 0.004 \\ (0.166) \end{array}$ | $\begin{array}{r} 0.001 \\ (0.815) \end{array}$ | $\begin{gathered} \hline * * 0.005 \\ (0.010) \end{gathered}$ | $\begin{array}{r} -0.001 \\ (0.882) \end{array}$ |
| OIL | $\begin{array}{r} * * 0.695 \\ (0.039) \end{array}$ | $\begin{array}{r} 0.795^{*} * * \\ (0.008) \end{array}$ | $\begin{gathered} * * 0.760 \\ (0.011) \end{gathered}$ | $\begin{array}{r} * * * 0.777 \\ (0.010) \end{array}$ | $\begin{gathered} * * 0.719 \\ (0.032) \end{gathered}$ | $\begin{array}{r} * * * 0.790 \\ (0.008) \end{array}$ | $\begin{array}{r} * * 1.162 \\ (0.025) \end{array}$ |
| SIZE $\times$ OIL | $\begin{array}{r} -1.217 * * \\ (0.012) \end{array}$ | $\begin{array}{r} -1.521 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -1.371^{* * *} \\ (0.001) \end{array}$ | $\begin{array}{r} -1.555 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -1.143 * * \\ (0.016) \end{array}$ | $\begin{array}{r} -1.369 * * * \\ (0.000) \end{array}$ | $\begin{array}{r} -2.138 * * * \\ (0.002) \end{array}$ |
| SIZE $\times$ AUTOC(1960-80) | $\begin{gathered} 0.008^{* *} \\ (0.039) \end{gathered}$ |  |  |  |  |  |  |
| EXCLUDED |  | $\begin{aligned} & 0.003 * \\ & (0.057) \end{aligned}$ | $\begin{array}{r} 0.002 \\ (0.354) \end{array}$ |  |  |  |  |
| SIZE $\times$ EXCLUDED |  |  | $\begin{aligned} & 0.008^{*} \\ & (0.067) \end{aligned}$ |  |  |  |  |
| EXCLUDED (1945-60) |  |  |  | $\begin{array}{r} 0.002 \\ (0.363) \end{array}$ |  |  |  |
| SIZE $\times$ EXCLUDED $(1945-60)$ |  |  |  | $\begin{array}{r} 0.005 \\ (0.148) \end{array}$ |  |  |  |
| EXCLUDED(1960-80) |  |  |  |  | $\begin{array}{r} 0.002 \\ (0.465) \end{array}$ |  |  |
| SIZE $\times \operatorname{EXCLUDED}(1960-80)$ |  |  |  |  | $\begin{gathered} 0.012 * * \\ (0.015) \end{gathered}$ |  |  |
| SIZE $\times$ PUB (EMR) |  |  |  |  |  | $\begin{array}{r} 0.009 * * * \\ (0.002) \end{array}$ |  |
| RELIGFREEDOM |  |  |  |  |  | $\begin{array}{r} * * * 0.043 \\ (0.007) \end{array}$ |  |
| SIZE $\times$ RELIGFREEDOM |  |  |  |  |  |  | $\begin{aligned} & 0.021^{*} \\ & (0.086) \end{aligned}$ |
| $\mathrm{R}^{2}$ | 0.836 | 0.846 | 0.846 | 0.846 | 0.836 | 0.846 | 0.763 |
| Obs | 34887 | 57559 | 57559 | 57559 | 34965 | 57559 | 22166 |

## Variations in the Public Prize

|  | Exclusion, EMR Measure, Religious Freedoms |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | [1] | [2] | [3] | [4] | [5] | [6] | [7] |
| SIZE | -0.000 | 0.007 *** | 0.003 | 0.004 | 0.001 | **0.005 | -0.001 |
|  | (0.985) | (0.001) | (0.337) | (0.166) | (0.815) | (0.010) | (0.882) |
| OIL | **0.695 | 0.795*** | **0.760 | ***0.777 | **0.719 | ***0.790 | **1.162 |
|  | (0.039) | (0.008) | (0.011) | (0.010) | (0.032) | (0.008) | (0.025) |
| SIZE $\times$ OIL | -1.217** | -1.521*** | -1.371*** | -1.555*** | -1.143** | -1.369*** | -2.138*** |
|  | (0.012) | (0.000) | (0.001) | (0.000) | (0.016) | (0.000) | (0.002) |
| SIZE $\times$ AUTOC(1960-80) | 0.008** |  |  |  |  |  |  |
|  | (0.039) |  |  |  |  |  |  |
| EXCLUDED |  | 0.003* | 0.002 |  |  |  |  |
|  |  | (0.057) | (0.354) |  |  |  |  |
| SIZE $\times$ EXCLUDED |  |  | 0.008* |  |  |  |  |
|  |  |  | (0.067) |  |  |  |  |
| EXCLUDED(1945-60) |  |  |  | 0.002 |  |  |  |
|  |  |  |  | (0.363) |  |  |  |
| SIZE $\times$ EXCLUDED(1945-60) |  |  |  | 0.005 |  |  |  |
|  |  |  |  | (0.148) |  |  |  |
| EXCLUDED(1960-80) |  |  |  |  | 0.002 |  |  |
|  |  |  |  |  | (0.465) |  |  |
| SIZE $\times$ EXCLUDED (1960-80) |  |  |  |  | 0.012** |  |  |
|  |  |  |  |  | (0.015) |  |  |
| SIZE $\times$ PUB(EMR) |  |  |  |  |  | 0.009*** |  |
|  |  |  |  |  |  | (0.002) |  |
| RELIGFREEDOM |  |  |  |  |  | ***0.043 |  |
|  |  |  |  |  |  | $(0.007)$ |  |
| SIZE $\times$ RELIGFREEDOM |  |  |  |  |  |  | 0.021* |
|  |  |  |  |  |  |  | (0.086) |
| $\mathrm{R}^{2}$ | 0.836 | 0.846 | 0.846 | 0.846 | 0.836 | 0.846 | 0.763 |
| Obs | 34887 | 57559 | 57559 | 57559 | 34965 | 57559 | 22166 |

## Other Material in the Paper

■ More variations:

- Group fixed effects
- Nonlinear specifications
- Alliances in Conflict

Summary

- Small groups initiate when the prize is private.
- Large groups initiate when the prize is public.
- Society may be actively conflictual, depending on the variety of threats.
- The data significantly support the predictions of the theory.

Two Remarks on Salience

- Dynamics.
- Institutional sluggishness versus speed of marker formation.
- Multiple Identities.
- Sen's argument.
- Ideologies and cultures versus resource-grabbing.

