Pillars of Prosperity
The Political Economics of Development Clusters

Lecture II
Political Violence, Putting Pieces Together

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This Lecture Series

- Try to tell the major story
- describe overall approach and main messages of book
  - use our core, macroeconomic and macropolitical, model
  - omit details, extensions, microfoundations, and references
  - look at data in more or less depth
- Road map
  - **Lecture I**: Overview, The Core Model of State Capacity, Partial Correlations
    summarizes chapters 1, 2, 3
  - **Lecture II**: Political Violence, Putting Pieces Together
    summarizes chapters 4, 5
  - **Lecture III**: Development Assistance, Political Reform, Lessons Learned
    summarizes chapters 6, 7, 8

The story so far

- **Lecture I**: Determinants of state capacity
  - we have developed a framework to analyze investments in the extractive and productive parts of the state
    fiscal and *legal capacity*

- Up to now, explicit politics has been kept in the background
  - the nature of political institutions (*cohesiveness*), and the rate of political turnover (*instability*)
  - still these parameters, θ and γ, crucially shape the motives for building the state
  - will be (partly) endogenized in this and following lecture

Outline - Lecture II

Motivation

- Risk of external violence
  - by argument in Lecture I, can promote state building
  - common interest vs. redistributive (group) interest

- Risk of internal political violence – civil war, repression?
  - not common interests – rather, extreme redistributive struggle may entail very different incentives to invest in state
  - one way to endogenize political instability, with high relevance for many developing countries
  - of course, better understanding of political violence is also important in and of itself

Facts about civil war
Figure 1.10

- Unfortunately, this is a common phenomenon
  - ▶ civil war has plagued many nations in postwar period
    prevalence over all nations and years since 1950 above 10%,
    cumulated death toll exceeds 15 million

- Two big facts
  - ▶ prevalence varies greatly over years, peaks above 15% in early 1990s
  - ▶ prevalence varies greatly over countries, civil war and poverty (low GDP/capita) strongly correlated
  - ▶ two leading interpretations of 2nd fact:
    - ★ reflects low opportunity costs of fighting (Collier-Hoeffler, 2004),
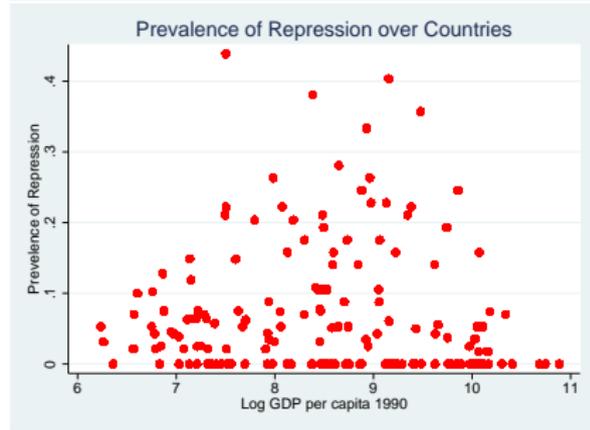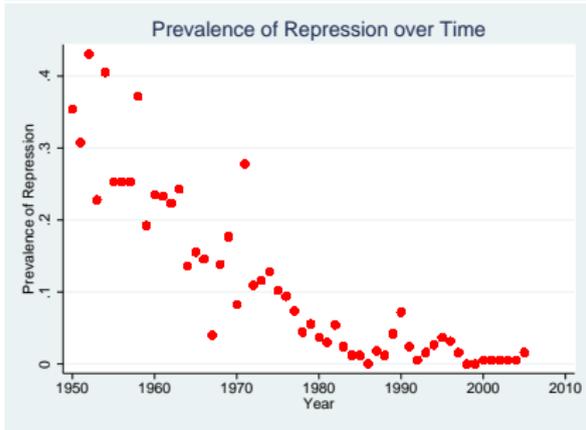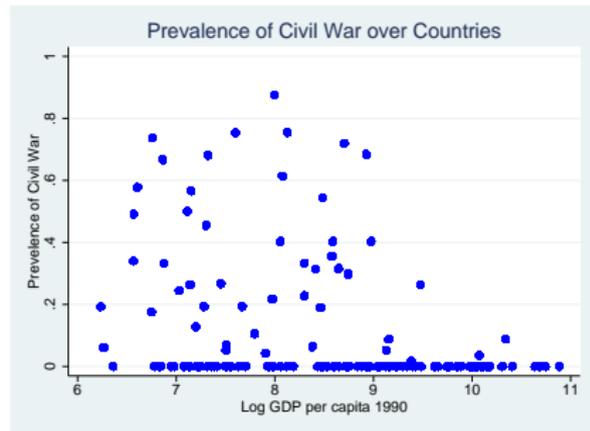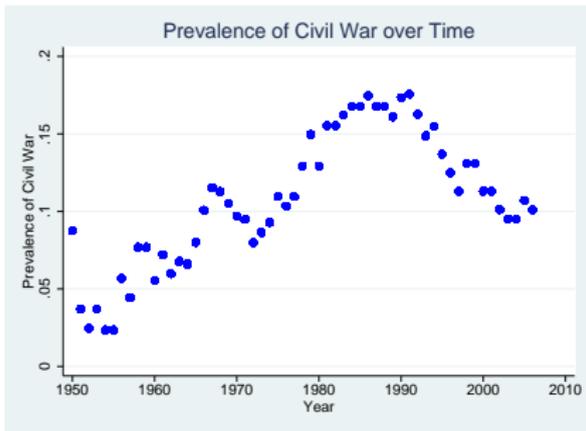   - ★ reflects low state capacity (Fearon-Laitin, 2003)

Figure 1.10 Prevalence of civil war and repression

Facts about government repression
Figure 1.10

- One-sided political violence
  - many governments use violent means to raise their probability of staying in power without civil war breaking out
  - such repression shows up in violations of human rights: executions, political murders, imprisonments, brutality, ...

- Prevalence?
  - by strict measure, purges, about 8% of country-years since 1950
  - by wider measure, human-rights violations, about 32%, 1976-2006

- Relation to civil war facts
  - purges have opposite trend to civil wars until early 1990s peaks among higher-income countries than civil war
  - hint of substitutability between the two

Existing research

- Theory of civil conflict
  - ▸ little role for institutions, including state capacities

- Empirical work on civil war and repression
  - ▸ weak connections to theory, so difficult to interpret results
  - ▸ takes income as given, though violence and income likely have similar determinants – e.g., parallel 'resource curse' literatures
  - ▸ separate literatures on civil war and repression, though both reflect that institutions fail to resolve conflicts of interest

Need for theoretical work

- Political violence, income, and state capacity?
  - ▸ political violence clusters with income – cf. Fig 1.10
    as well as state capacity – recall Fig 1.4
  - ▸ two-way relations amongst these outcomes
  - ▸ same economic and political determinants may cause all three

- Complex relations in the data calls for explicit theory
  - ▸ existing theory does not take institutions well into account
  - ▸ need explicit theory to build bridge to empirical work
  - ▸ explicit theory may also help us understand relation between
    civil war and repression – and their relation to state capacity

Analytical approach

- First step – this section
  - ▶ study a simple model of political violence, extending model
    in **Lecture I,** but treat legal and fiscal capacity decisions as given
  - ▶ (long) detour confront conflict model's implications with data

- Second step – next section
  - ▶ reintroduce state-capacity investments in new framework
  - ▶ return briefly to the data
  - ▶ put pieces together

Modifications of earlier set up

- Modifications of earlier setup
  - ▶ start out from exactly the same model of policy and state-capacity investments as in **Lecture I**
  - ▶ replace earlier exogenous transition of power by outcome of (potential) conflict, triggered by investment in violence
  - ▶ but treat state capacity at $s = 1, 2$ as given

Violence and transitions of power

- Incumbent and opposition can simultaneously invest in violence
    - period 1 opposition group O_1 can mount insurgency with army $L^O \leq \overline{L}^O$, paid within group, at marginal cost of funds ν
    - incumbent group I_1 can invest in army $L^I \leq \overline{L}^I$, paid out of the public purse, at marginal cost λ_1
    - no conscription: each soldier just paid the period-1 wage $\omega(\pi_1)$

- Probability of opposition takeover – conflict technology
    - $\gamma(L^O, L^I; \xi)$ increasing in L^O, decreasing in L^I
    - winner becomes next period's incumbent, $I_2 \in \{A, B\}$
      loser becomes new opposition, $O_2 \in \{A, B\}$

- Peaceful transitions
    - if nobody arms, transition probability is $\gamma(0, 0; \xi)$

New timing

1. We begin with initial stocks of state capacities $\{\tau_1, \pi_1\}$ and an incumbent group I_1. Nature determines α_1 and R.

2. I_1 chooses a set of period-1 policies $\{t_1, r_1^I, r_1^O, p_1^I, p_2^O, g_1\}$ and determines (through investments) the period-2 stocks of fiscal and legal capacity $\{\tau_2, \pi_2\}$. I_1 and O_1 simultaneously invest in violence levels L^I and L^O.

3. I_1 remains in power with probability $1 - \gamma(L^O, L^I, \xi)$, and nature determines α_2.

4. I_2 chooses period-2 policy $\{t_2, r_2^I, r_2^O, p_2^I, p_2^O, g_2\}$.

   ▶ we will study subgame perfect equilibrium in investments in violence and policy at stages 2 and 4
   ▶ in **next section**, we will revisit state-capacity investments τ_2 and π_2 at stage 2 – now take those and $y(\pi_2)$ as given

Stage 4 – New incumbent I_2 policymaker

- Period 2 budget and policy instruments
  - exactly as before with budget constraint

$$R + \frac{t[y(p_2^I) + y(p_2^O)]}{2} = g_2 + \frac{r_2^I + r_2^O}{2}$$

- Equilibrium policies
  - same outcome as in **Lecture I,** also in period 1
- Indirect payoff and value functions
  - in earlier notation, we have

$$\begin{aligned} W(\alpha_s, \tau_s, \pi_s, R, m_s, \beta^J) &= \alpha_s G(\alpha_s, \tau_s) + (1 - \tau_s)y(\pi_s) + \\ &\quad \beta^J[R + \tau_s y(\pi_s) - G(\alpha_s, \tau_s) - m_s] \end{aligned}$$

$$U^J(\tau_2, \pi_2) = \begin{matrix} [\phi W(\alpha_H, \tau_2, \pi_2, R, 0, \beta^J) + \\ (1 - \phi) W(\alpha_L, \tau_2, \pi_2, R, 0, \beta^J)] \end{matrix}$$

Stage 2 – Define the investment objectives

- Expected utilities of groups I_1 and O_1

$$W(\alpha_1, \tau_1, \pi_1, m_1, \beta^J)$$
$$+(1 - \gamma(L^O, L^I, \xi))U^I(\tau_2, \pi_2) + \gamma(L^O, L^I, \xi)U^O(\tau_2, \pi_2)$$

and

$$W(\alpha_1, \tau_1, , \pi_1, m_1, \beta^J) - \nu\omega(\pi_1) L^O$$
$$+\gamma(L^O, L^I, \xi)U^I(\tau_2, \pi_2) + [1 - \gamma(L^O, L^I, \xi)]U^O(\tau_2, \pi_2)$$

  - now, m_1 includes violence investment by I_1, i.e., $\omega(\pi_1) L^I$, whereas investment by O_1 deducted from period-1 payoff

Stage 2 – Preliminaries

- Prospective tradeoff
  - when incumbent and opposition decide how much to invest, they weigh investment cost against higher probability of policy control
- First-order conditions

$$-\gamma_I(\hat{L}^O, \hat{L}^I, \xi) \left[U^I(\tau_2, \pi_2) - U^O(\tau_2, \pi_2) \right] - \lambda_1 \omega(\pi_1) \leq 0$$

  - and

$$\gamma_O(\hat{L}^O, \hat{L}^I, \xi) \left[U^I(\tau_2, \pi_2) - U^O(\tau_2, \pi_2) \right] - \nu \omega(\pi_1) \leq 0$$

  - common first term can be written

$$U^I(\tau_2, \pi_2) - U^O(\tau_2, \pi_2) = \omega(\pi_1) \, 2 \, (1 - 2\theta) \, Z$$

  where

$$Z = \frac{R + \tau_2 y(\pi_2) - E(G(\alpha_2, \tau_2))}{\omega(\pi_1)}$$

  is the wage-adjusted, expected redistributive pie in period 2

Restrictions on conflict technology

- Make following assumption

Assumption 4.1

For all $L^J \in \left[0, \overline{L}^J\right]$, we have:

(a) if $\gamma \in (0,1)$, $\gamma_O > 0, \gamma_I < 0$, $\gamma_{OO} < 0$, $\gamma_{II} > 0$,

(b) $\frac{-\gamma_I(0,0;\xi)}{\gamma_O(0,0;\xi)} \geq \frac{\alpha_H}{\nu}$, and

(c) $\frac{\gamma_I \gamma_{OO}}{\gamma_O} \geq \gamma_{IO} \geq \frac{\gamma_O \gamma_{II}}{\gamma_I}$.

- consistent with commonly used contest functions with certain assumptions on parameters (cf. ch 4)

- this assumption allows us to pin down the Nash equilibrium associated with the two first-order conditions

Peaceful resolution of conflict game

- Suppose $\alpha_2 = \alpha_H > 2 \geq 2(1 - \theta)$
  - then, $G(\alpha_H, \tau_2) = R + \tau_2 y(\pi_2) \Rightarrow Z = 0$
    i.e., no transfers will be paid at stage 4

- Suppose $\alpha_2 = \alpha_L \geq 2(1 - \theta)$
  - then, Cohesiveness holds, and we have a common-interest state i.e.,
    $Z = 0$ and any residual revenue again spent on public goods

  - in both cases expected payoff for J is decreasing in L^J, whichever group
    gets into power, so $L^J = 0, J = I, O$

Proposition 4.1

If (1) $\alpha_L \geq 2(1 - \theta)$, or (2) $\phi \rightarrow 1$, no group invests in violence, i.e.
$\hat{L}^I = \hat{L}^O = 0$.

- there is always peace in common-interest states,
  or in states with high risk of external violence

Prospectively violent solution to conflict game

Proposition 4.2

If Assumption 4.1 holds, $\alpha_L < 2(1-\theta)$ and $\phi < 1$, there are two thresholds $Z^I(\theta; \xi)$ and $Z^O(\theta; \xi)$,

$$
\begin{aligned}
Z^I(\theta; \xi) &= -\frac{\lambda_1}{\gamma_I(0,0;\xi)2(1-2\theta)} \\
&< Z^O(\theta; \xi) = \frac{\nu}{\gamma_O(0,0;\xi)2(1-2\theta)}
\end{aligned}
$$

such that:

1. *If $Z \leq Z^I$, there is peace with $\widehat{L}^O = \widehat{L}^I = 0$.*
2. *If $Z \in (Z^I, Z^O)$, there is repression with $\widehat{L}^I > \widehat{L}^O = 0$.*
3. *If $Z \geq Z^O$, there is civil conflict with $\widehat{L}^I, \widehat{L}^O > 0$.*

Moreover, $\widehat{L}^O$ and $\widehat{L}^I$, whenever positive, increase in Z.

Anatomy of three regimes

1. Peace: $Z < Z^I$
   - wages ω_1 high, non-tax income R low, opposition's share θ high; too expensive to fight, or not enough to fight over

2. Repression: $Z \in [Z^I, Z^O]$
   - ω_1 lower/R higher/θ lower, so more redistribution at stake, and incumbent's arming threshold lower, by Assumption 4.1b.

3. Civil war: $Z > Z^O$
   - even more at stake, so both parties invest in violence, and nobody stops fighting as Z goes up, by Assumption 4.1c; in fact, I always fights more intensively

Parallels with state-capacity determinants

- Common-interest states
  - never have violence; recall they always invest in state capacity

- Redistributive states
  - sometimes have violence; variables that trigger more violence also generate low state capacity
  - high resource-rent or cash-aid share, high R gives high Z
  - low cohesiveness of political institutions, low θ gives low Z^I, Z^O
  - low demand for public goods, low ϕ gives low Z^I, Z^O
  - low income (given τ and π), low ω_1 gives high Z

- Weak states
  - often have violence; recall that weak states – in countries with low θ, and low ϕ – do not invest in the state at all

Role of political stability

- State capacity framework in **Lecture I**
  - there, stability treated as parametric – a high value of γ implies weak motives to invest in state capacity

- Political violence framework
  - here, γ is endogenous

- How do the forces highlighted in the two frameworks interact?
  - a natural question – posed and answered in **next section**

- ... but first a (long) detour into the empirics of political violence

From Theory to Evidence

Preliminaries – observability

- Back to basic model in Section 2
  - which parts of Z_s and Z_s^I observed for certain country, at time s?
  - can measure, or find decent proxies for R_s, ω_s and θ
  - but genuinely hard to measure $\phi, \gamma_O(0, 0; \xi_s)$ and $\gamma_I(0, 0; \xi_s)$ and cost parameters λ and ν

- Unobserved randomness in determinants of violence
  - treat (τ, π) as given and write random variable $Z_s - Z_s^I$ as

$$Z_s - Z_s^I = \frac{R_s}{\omega_s} - \overline{Z}^I - \frac{\varepsilon_s^I}{\omega_s}$$

  where $\overline{Z}^I$ is a constant and ε_s^I an "error term" with c.d.f. $F^I(\varepsilon)$

Preliminaries – observability (continued)

- Similarly, we can write

$$Z_s - Z_s^O = \frac{R_s}{\omega_s} - \overline{Z}^O - \frac{\varepsilon_s^O}{\omega_s}$$

  where error ε_s^O has c.d.f. $F^O(\varepsilon)$

- Incidence of violence ?
  - we do not directly observe Z_s, Z_s^I and Z_s^O
  - but do observe if there is civil war, or repression, in s
    and may observe $\alpha_s = \alpha_H$ (if interpret as external conflict)

Conditional probability of civil war

- By Proposition 4.2, civil war in country c at date t if

$$Z_s - Z_s^O \geq 0 \iff \varepsilon_s^O \leq R_s - \omega_s \overline{Z}^O$$

  ▶ given the information available to us, the conditional probability – i.e., the likelihood – to observe this event is

$$F^O(R_s - \omega_s \overline{Z}^O)$$

- Prediction
  ▶ higher R_s or lower ω_s raises probability of observing civil war
  ▶ but, by Proposition 4.1, no effect if ϕ close to 1 or $\alpha_L \geq 2(1 - \theta)$
  ▶ can test this with time-varying measures of R and ω

Conditional probability of other violence states

- Conditional probability of observing peace
  - but not civil war, at date s

$$1 - F^I(R_s - \overline{Z}^I \omega_s)$$

  - down with R_s up with ω_s *unless* $\phi \to 1$ *or* $\alpha_L \geq 2(1 - \theta)$

- Conditional probability of observing repression

$$F^I(R_s - \overline{Z}^I \omega_s) - F^O(R_s - \overline{Z}^O \omega_s)$$

  - effects of shocks, now depend on densities

- Alternative way of stating model predictions
  - higher R_s or lower ω_s raise the probability of observing some form of political violence
  - states of peace, repression, and civil war *ordered* in Z_s
  - calls for estimating ordered logit

Identification – what variation to use in data?

- How clean inference from unobserved determinants?
  - using cross-sectional variation risks confounding variables of interest, like R and ω, with nuisance parameters, like ξ_s
  - instead estimate panel regressions with fixed *country* effects equivalent to estimating, e.g., for civil war

$$F^O(R_s - \overline{Z}^O \omega_s) - E\{F^O(R_s - \overline{Z}^O \omega_s)\}$$

- Heterogeneity in incidence of violence over time
  - now driven by time variation in R and ω
  - add fixed *year* effects to allow for world-wide shocks, non-parametric trends in violence – recall Figure 1.10 exploit only *country-specific* time variation in R and ω

Specification and identification – further issues

- How take fact that predictions conditional on θ into account?
  - let $\Theta = 1$ be cohesive political institutions $(\alpha_L \geq 2(1-\theta))$
    and $\Theta = 0$ non-cohesive political institutions
  - represent index function, in country c period s, as

$$R_{c,s} - \overline{Z}^O \omega_{c,s} = a_c(\Theta_c) + a_t(\Theta_c) + b(\Theta_c) \widetilde{Z}_{c,s}$$

  - where $\widetilde{Z}_{c,s}$ are time-varying regressors proxying for $R_{c,s}$ and $\omega_{c,s}$
  - according to the theory $b(0) > 0$, while $b(1) = 0$

- Still need exogenous variation in $\widetilde{Z}_{c,s}$
  - within-country variation no panacea, unless we can also credibly argue that variation in $\widetilde{Z}_{c,s}$ is exogenous to violence

Data and Empirical Results
Political violence data

- Civil war
  - binary indicator from Uppsala/PRIO data set, 1950-2005
  - alternative: COW data, but shorter series (end in 1997)

- Repression
  - purges variable from Banks (2005) data set, 1950-2005
  - alternative: PTS data, but shorter series (begin in 1976) and doubts about US State Department's coding during cold war

- Construct ordered dependent variable
  - combine repression and civil war measures as follows
    peace = 0, repression/but not civil war = 1, civil war = 2

Political institutions data

- Main indicator of weak and strong institutions
  - ► indicator for highest score (7 on 1-7 scale) for
    Executive Constraints variable in the Polity IV data set
  - ► corresponds best to θ in the theory
  - ► set indicator for the whole panel $\Theta_c = 1$ only if
    (i) positive prevalence pre-1950 *and* (ii) sample prevalence > 0.6
  - ► conservative criterion: selects less than 20% of sample

- Alternative measure
  - ► indicator based on parliamentary democracy taken from Polity IV and
    Persson-Tabellini data sets
  - ► analogous (i)-(ii) definition for $\Theta_c = 1$

Two forms of shocks to $\widetilde{Z}_{c,s}$

- Natural disasters – negative shocks to ω or positive shocks to R
  - from EM-DAT data set, 1950-2005
  - indicator for having at least one out of four disaster events: heat-wave, flood, slide, or tidal wave – associated with 2.5% lower level of GDP/capita

- Cold-war, security-council membership – positive shocks to R
  - agnostic about effect of membership, in general
  - but insist members likely to get more *aid* due to geopolitical importance during cold war (Kuziemko–Werker 2006, for US)

An initial observation

- By Prop 4.1 – no violence when $\alpha_L \geq 2(1 - \theta)$?

  - 32 countries in our panel classified as $\Theta_c = 1$

    - ★ only 8 (25%) of those has some year with either civil war or repression from 1950 to 2005

  - 125 countries classified as $\Theta_c = 0$

    - ★ 97 (80%) of those has some year with either civil war or repression in same period

  - informative, but hazardous to draw causal inference from such cross-sectional variation

Basic results – Table 4.4

- Estimate ordered logits implied by the theory
  - columns (1)-(3)
    - ★ fixed-effect ordered logits – implement as suggested by Ferrrer-i-Carbonell and Frijters (2004)
    - ★ full sample, and interaction effects with indicators for cohesive institutions and measured by constraints on executive parliamentary democracy, respectively

- Results in line with theoretical predictions
  - only significant effects on violence with expected sign in samples with low executive constraints or non-parliamentary democracies
  - statistically robust: results hold up when bootstrap standard errors in column (8)

Dependent Variable	(1) Ordered Variable	(2) Ordered Variable	(3) Ordered Variable	(4) Political Violence	(5) Political Violence	(6) Civil War	(7) Civil War	(8) Ordered Variable
Natural Disaster	0.263 (0.107)**	0.317 (0.11)***	0.299 (0.111)***	0.278 (0.109)**	0.327 (0.112)***	0.37 (0.152)**	0.431 (0.155)***	0.263 (0.111)**
Security council member	-1.048 (0.399)***	-1.194 (0.417)***	-1.382 (0.456)***	-1.110 (0.412)***	-1.269 (0.43)***	-1.360 (0.545)**	-1.383 (0.547)**	-1.048 (0.413)***
Security council member in cold war	1.275 (0.439)***	1.461 (0.458)***	1.657 (0.495)***	1.267 (0.453)***	1.465 (0.472)***	1.074 (0.633)*	1.105 (0.635)*	1.275 (0.504)**
Natural disaster × Strong institutions		-.701 (0.374)*	-.333 (0.318)		-.618 (0.376)*		-1.233 (0.595)**	
Security council member × Strong institutions		1.975 (1.173)*	2.940 (1.123)***		2.186 (1.178)*			
Security council member in cold war × Strong institutions		-2.577 (1.375)*	-3.379 (1.247)***		-2.746 (1.381)**			
Strong institutions measure		High executive con- straints 1950-2005	Parliamentary Democ- racy 1950-2005		High executive con- straints 1950-2005		High executive con- straints 1950-2005	
Estimation method	FE Ordered Logit	FE Ordered Logit	FE Ordered Logit	FE Logit	FE Logit	FE Logit	FE Logit	FE Ordered Logit
Observations	4251	4251	4251	4251	4251	2061	2061	4251
No. of countries	97	97	97	97	97	49	49	97

Look at alternative violence margins – Table 4.4

- Estimate conditional logits implied by the theory – columns (4)-(7)
  - ▸ conditional (fixed effect) logit for two margins where theory has bite: peace vs. violence, and non-civil war vs. civil war
  - ▸ full sample and interaction effects with high executive constraints

- Results again, basically, in line with theoretical predictions
  - ▸ only see significant effects on both forms of violence with low executive constraints

Inspecting the mechanism – Table 4.5

- Go further than the reduced forms in earlier tables?
  - columns (1)-(4)
    - ⋆ fixed-effect OLS (linear probability model); useful check on robustness of cols (4)-(7) in earlier table, and results easier to interpret in quantitative terms
  - columns (5)-(6)
    - ⋆ "first stage" effects on total aid (OECD data) and GDP per capita (PWT data) of natural disasters and UN Security Council
  - columns 7-8
    - ⋆ "second stage" of fixed-effects IV; at best a diagnostic, as the exclusion restrictions not necessarily satisfied
- Mechanism?
  - appears to run mainly through higher aid flows

Table: Table 4.5 Extended Econometric Results

Dependent Variable	(1) Political Violence	(2) Political Violence	(3) Civil War	(4) Civil War	(5) Log GDP per capita	(6) Log aid disbursements	(7) Political Violence	(8) Civil War
Natural Disaster	0.024 (0.013)*	0.029 (0.017)*	0.029 (0.013)**	0.043 (0.016)***	-.005 (0.003)	0.105 (0.043)**		
Security council member	-.066 (0.027)**	-.092 (0.029)***	-.051 (0.023)**	-.053 (0.023)**	0.009 (0.008)	-.269 (0.092)***		
Security council member in cold war	0.09 (0.04)**	0.129 (0.045)***	0.034 (0.029)	0.036 (0.029)	-.004 (0.01)	0.434 (0.113)***		
Natural disaster × Strong institutions		-.024 (0.037)		-.079 (0.024)***				
Security council member × Strong institutions		0.148 (0.054)***						
Security council member in cold war × Strong institutions		-.205 (0.068)***						
Two-year lagged Log GDP per capita					0.905 (0.013)***			
Log GDP per capita							0.062 (0.039)	0.046 (0.04)
Log aid disbursements							0.191 (0.046)***	0.161 (0.05)***
Observations	5880	5880	5880	5880	6300	5067	3914	3914
Number of countries	158	158	158	158	178	150		
R-squared								

Outline

Endogenous turnover

- Return to state-capacity investments
  - political-violence model endogenizes political turnover
  - structure of model gives convenient recursive structure, where violence shapes incentives only via political instability
- Assume ξ indexes the incumbents advantage in fighting:

Assumption 5.1

$-\gamma_{I\xi}\left(L^O, L^I; \xi\right) > 0$ and $\gamma_{O\xi}\left(L^O, L^I; \xi\right) < 0.$

- Equilibrium turnover
  - define the equilibrium turnover rate (using propositions 4.1 & 4.2 and the Nash equilibrium $(\hat{L}^I, \hat{L}^O)$):

$$\Gamma\left(Z, \nu, \xi\right) = \begin{cases} \gamma\left(\hat{L}^O, \hat{L}^I, \xi\right) & Z > Z^O(\theta, \nu, \xi) \\ \gamma\left(0, \hat{L}^I, \xi\right) & Z^O(\theta; \nu, \xi) \geq Z > Z^I(\theta, \lambda_1, \xi) \\ \gamma\left(0, 0, \xi\right) & Z^I(\theta, \lambda_1, \xi) \geq Z \end{cases}$$

Comparative statics of Γ

Proposition 5.1

If Assumption 4.1 and 5.1 hold, the probability that the incumbent loses office at the end of period 1 varies with (Z, ν, ξ) as follows:

1. *An increase in Z reduces the probability that the incumbent loses office when there is either repression or civil war.*
2. *An increase in ν reduces the probability that the incumbent loses office when there is civil war.*
3. *An increase in ξ reduces the probability that the incumbent loses office when there is either repression or civil war.*

Implications for investment

- State capacity problem is recursive
- Euler equations for legal and fiscal capacity become

$$y_\pi(\pi_2)[1 + (E(\lambda_2; Z, \nu, \xi, \theta) - 1)\tau_2] \leq \lambda_1 \mathcal{L}_\pi (\pi_2 - \pi_1)$$
$$\text{c.s.} \quad \pi_2 - \pi_1 \geq 0$$

$$y(\pi_2)[(E(\lambda_2; Z, \nu, \xi, \theta) - 1] \leq \lambda_1 \mathcal{F}_\tau (\tau_2 - \tau_1)$$
$$\text{c.s.} \quad \tau_2 - \tau_1 \geq 0$$

where

$$E(\lambda_2; Z, \nu, \xi, \theta) = \phi \alpha_H + (1 - \phi) E(\lambda_2 | \alpha_L; Z, \nu, \xi, \theta)$$

is *expected* value of public funds with

$$E(\lambda_2 \mid \alpha_L; Z, \nu, \xi, \theta)$$
$$= \begin{cases} \alpha_L & \text{if } \alpha_L \geq 2(1 - \theta) \\ 2[(1 - \theta)(1 - \Gamma(Z, \nu, \xi)) + \theta \Gamma(Z, \nu, \xi)] & \text{otherwise} \end{cases}$$

The three types of states

- Again, the same two conditions
- Cohesiveness condition is unaffected
  - no effect of allowing for conflict, as common-interest states are always peaceful, by Proposition 4.1
- Stability condition becomes

Stability:

$$\phi\alpha_H + (1 - \phi)\, 2\,[(1 - \Gamma(Z, \nu, \xi))(1 - \theta) + \Gamma(Z, \nu, \xi)\,\theta] \geq 1$$

- LHS increases in Z, ν, ξ, as does violence – by Propositions 4.2 and 5.1 – which drives stability and investments in the state in same direction as violence, outside peaceful state
- but extension with private investment (see ch 4) adds extra channel; civil-war risk cuts private investment, spills over to state building

Role of common interests and cohesive institutions

- Parameters ϕ and θ tie things together
  - high θ /high ϕ: we see high investments in fiscal and legal capacity, as well as low violence
  - low θ /low ϕ: we see low investments in fiscal and legal capacity, as well as repression or conflict

- Opposite link within the repression and conflict regimes
  - feedback mechanism actually means that lower θ raises investment in state capacity, as it raises the incumbent's propensity to fight, which reduces expected turnover.

Back to clustering of Income and conflict – Figure 5.1

- Distinct empirical patterns
  - ▶ robust correlation between low income and conflict
  - ▶ robust correlation between low state capacity and conflict
- Several theoretical interpretations possible
  - ▶ underlying parameters, such as ϕ and θ, may endogenously drive income and conflict in opposite directions
  - ▶ exogenous shocks to income may drive down the risk of conflict (by raising opportunity cost of fighting)
  - ▶ exogenous shocks to conflict propensity, via parameters such as R, ν and ξ may drive down income via lower private investment (see the extension earlier)
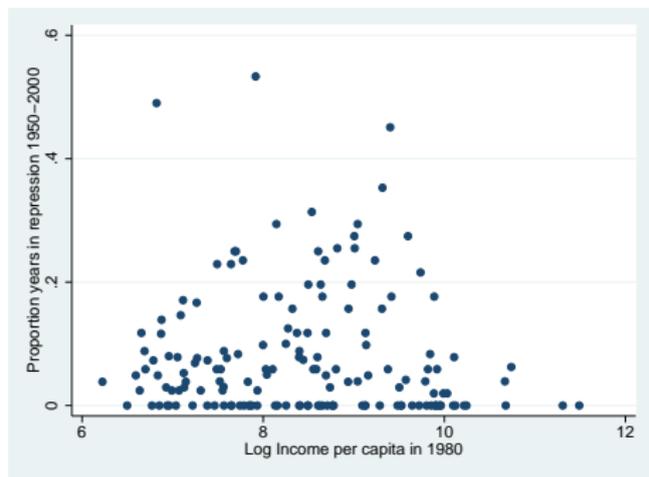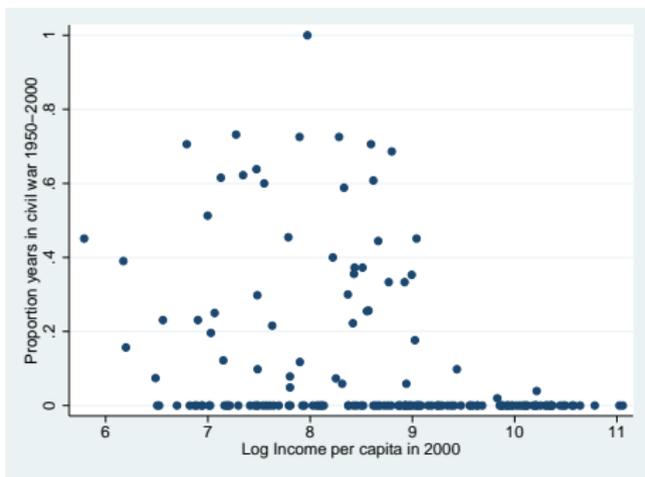 - ▶ hazardous to interpret raw correlation in causal way

Figure 5.1 Prevalence of civil war and repression by income

Theoretical interpretations
Figures 5.2 & 5.3

- How interpret correlations between state capacity and conflict?
  - according to our framework, there are two possibilities

- (i) Raw correlations – Figure 5.2 – due to omitted θ and ϕ
  - high θ and ϕ drive high investment in state capacity, which feeds back to income; high θ and ϕ also gives low risk of violence and conflict
- (ii) Partial correlations – Figure 5.3 – due to omitted R, ν and ξ
  - given low θ and ϕ, some countries with low ν or high R more civil-war prone, and some with low ξ less repression prone
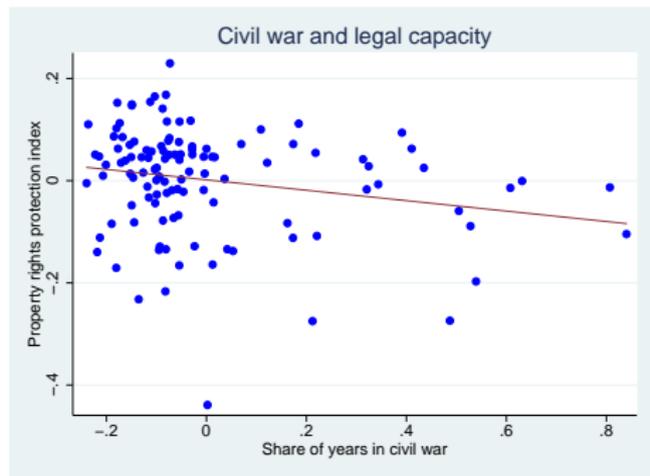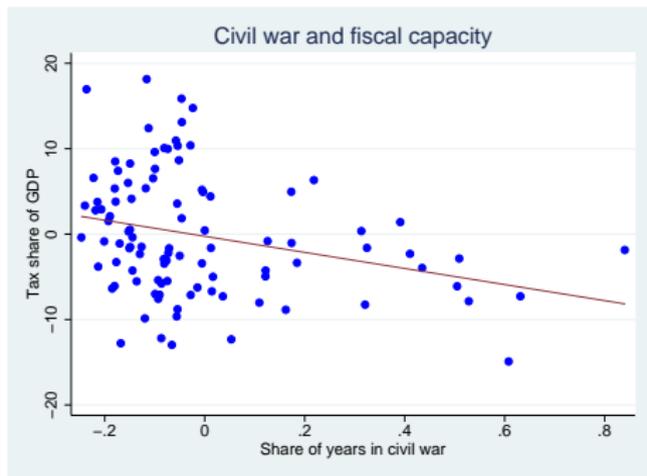 - these factors raise γ and may cut investments in state capacity

Figure 5.2 State capacity conditional on violence

Figure 5.3 State capacity and civil war

Our state space – Table 5.1

- Summarize insights from our core model, so far:

	Weak	Redistributive	Common interest
Peace	low θ, ϕ, ξ, R high ν	high ϕ low θ	high θ, ϕ
Repression	low θ, ϕ, ξ, R high ν	low θ, ϕ, R high ν, ξ	n/a
Civil war	low θ, ν, ξ, ϕ high R	low θ, ϕ, ν high ξ, R	n/a

- An *Anna Karenina* principle (cf. 1st line of Tolstoy's novel)

  "All happy families resemble each other; each unhappy family is unhappy in its own way."