Zvi Griliches Lectures 2011

Pillars of Prosperity
The Political Economics of Development Clusters

Torsten Persson

Lecture I
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A. Overview and B. The Core Model of State Capacity

Motivation, Objectives and Background

Huge income disparities

Massive gap between rich and poor countries

- a ratio of income per capita on the order of 200
  is a common starting point

Why are some countries rich and others poor?

- classical question in economics, and in other social sciences
- also of paramount importance for donors in various forms
  of development assistance

But development not only about income

- very clear in policy discussion about weak/fragile states

Weak/fragile states – Figures 1.1-2

Central concept in development policy community

- subject of various initiatives

What is a weak/fragile state?

- it can not support basic economic functions, raise any substantial revenues, deliver basic services, keep law and order, ...

Existing indexes

- examples from Brookings and Polity IV classifications, though definitions appear to mix up symptoms and causes
- incidence depends on definition, but 20-30 states failed/very weak equally many fragile/weak, and others in risk zone
- concentration in Sub-Saharan Africa, south/central Asia

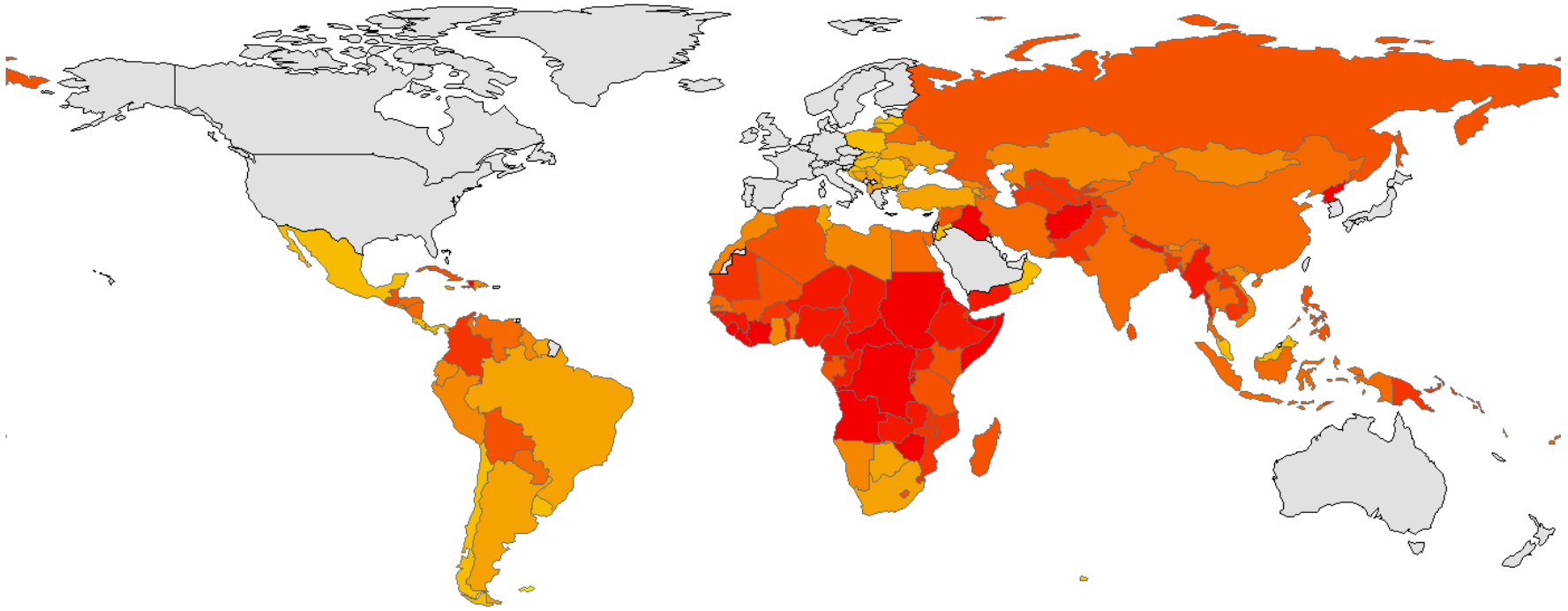


Figure 1.1 Brookings Index of Weak States 2008

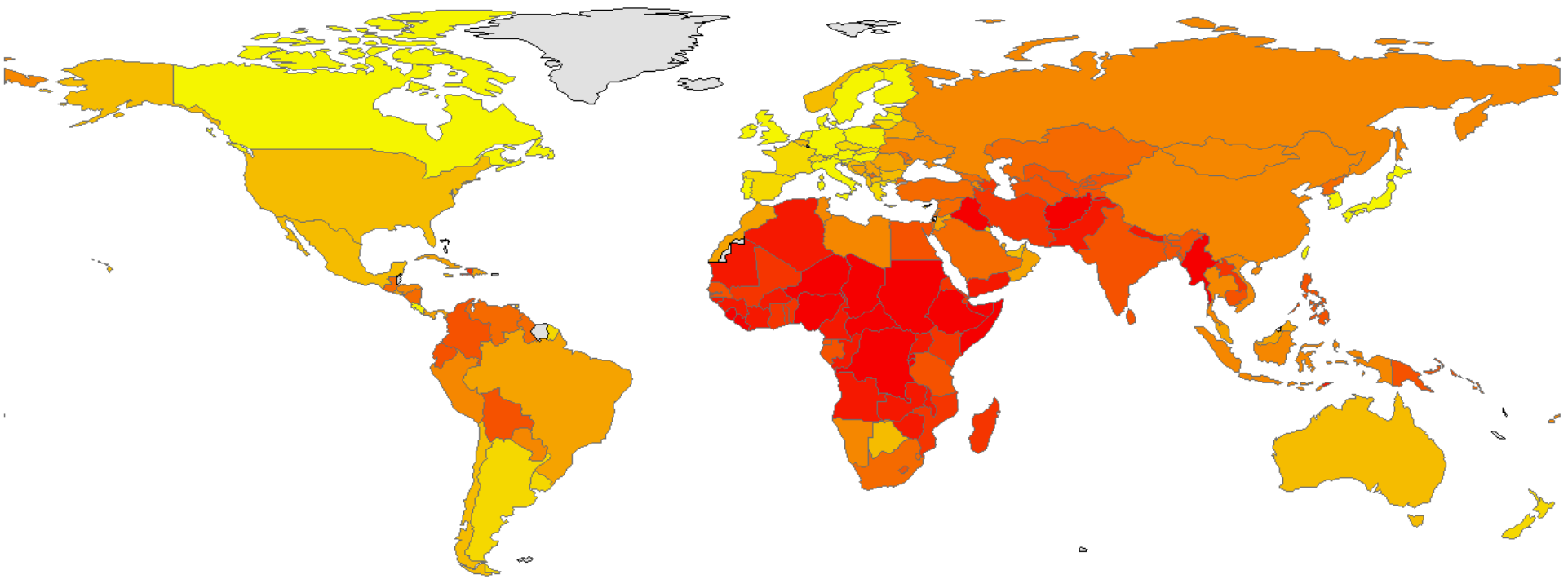


Figure 1.2 Polity IV Index of Fragile States 2009

Development clusters

State institutions link not only with *income*, but with *violence*

- weak state institutions in countries with massive poverty and societies plagued by internal conflicts
- developed countries: high income, institutions work, policies in good order, conflicts resolved peacefully, ...
- strong clustering of outcomes in different dimensions
  few strong economies with weak states

Multidimensional problem – *the* development problem?

- clustering of low income, violence, and a number of dysfunctional state institutions

Example of clustering – Figures 1.3-1.5

Two forms of *state capacity*

- extractive capacity: e.g., infrastructure to raise taxes from broad bases like income (or value added)
- productive capacity: e.g., infrastructure to enforce contracts or protect property rights

Illustrate with two specific measures

- alternative measures (later on) produce similar results
- *fiscal* capacity: total taxes as share of GDP, measured at 1999 (IMF data)
- *legal* capacity: index of protection of property rights, also at the end of 1990s (ICRG data)
- strongly positively correlated with each other, GDP per capita (in 2000), civil war (since 1950), and fragile state indexes

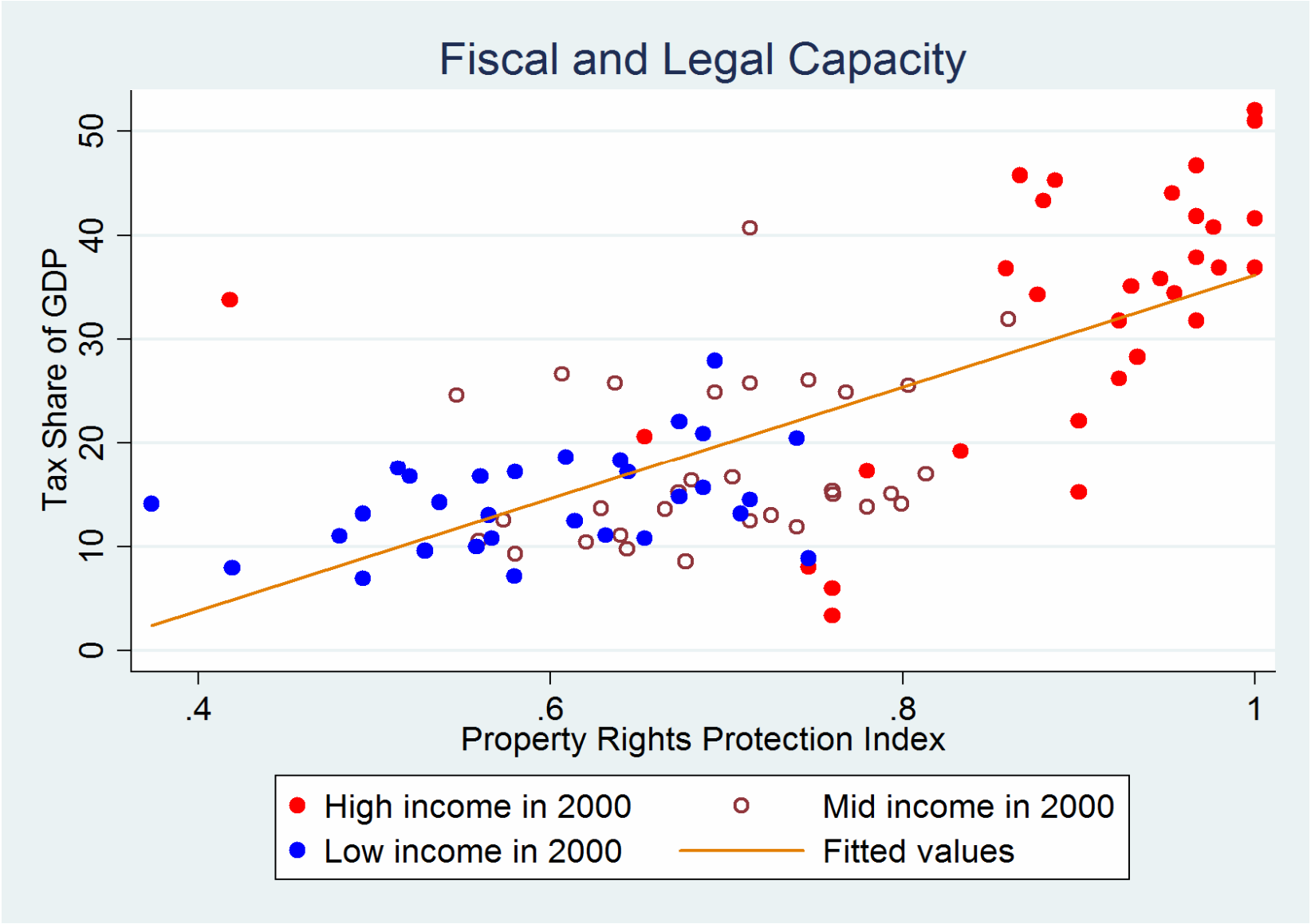


Figure 1.3 Legal and fiscal capacity conditional on income

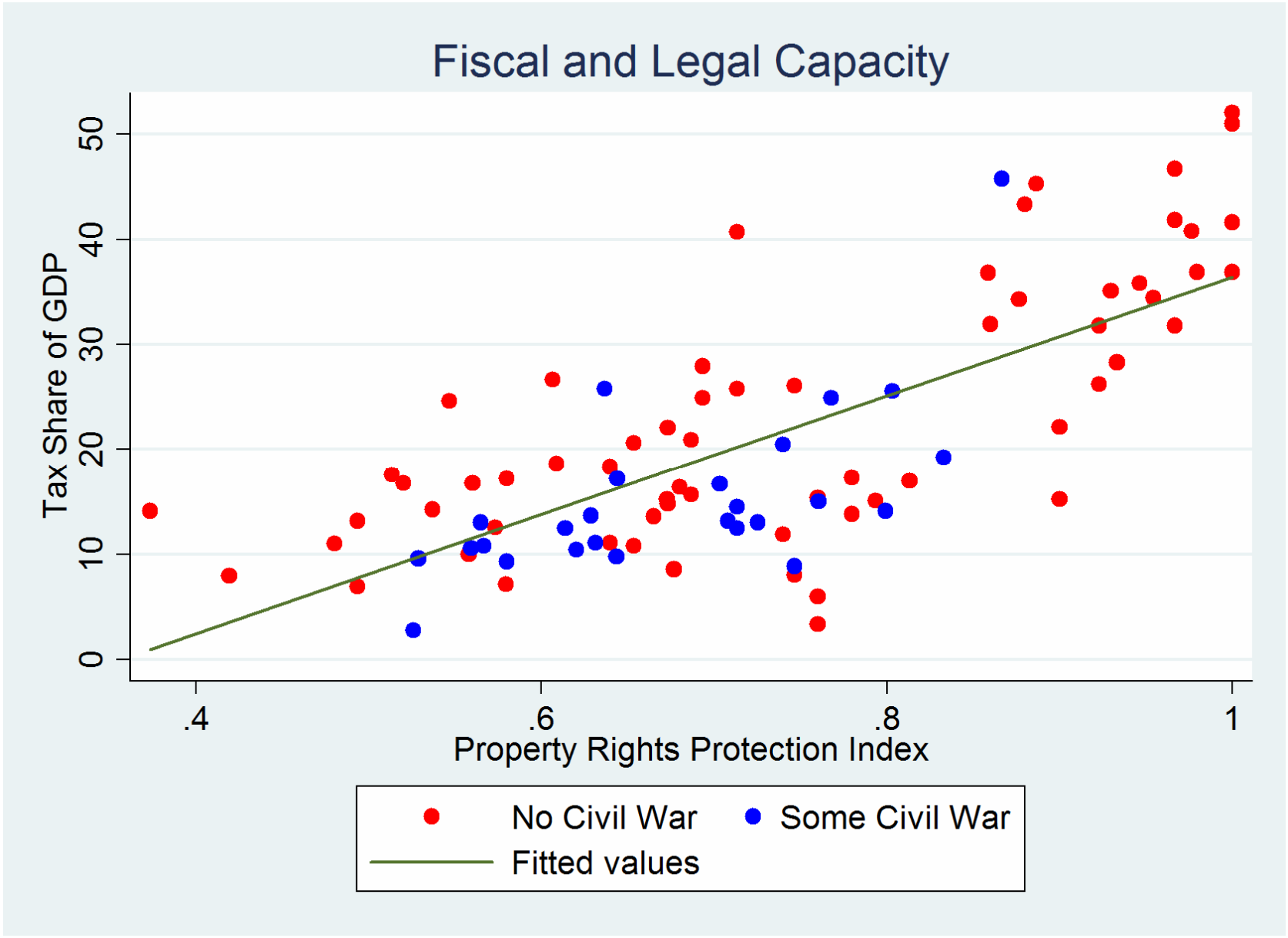


Figure 1.4 Legal and fiscal capacity conditional on civil war

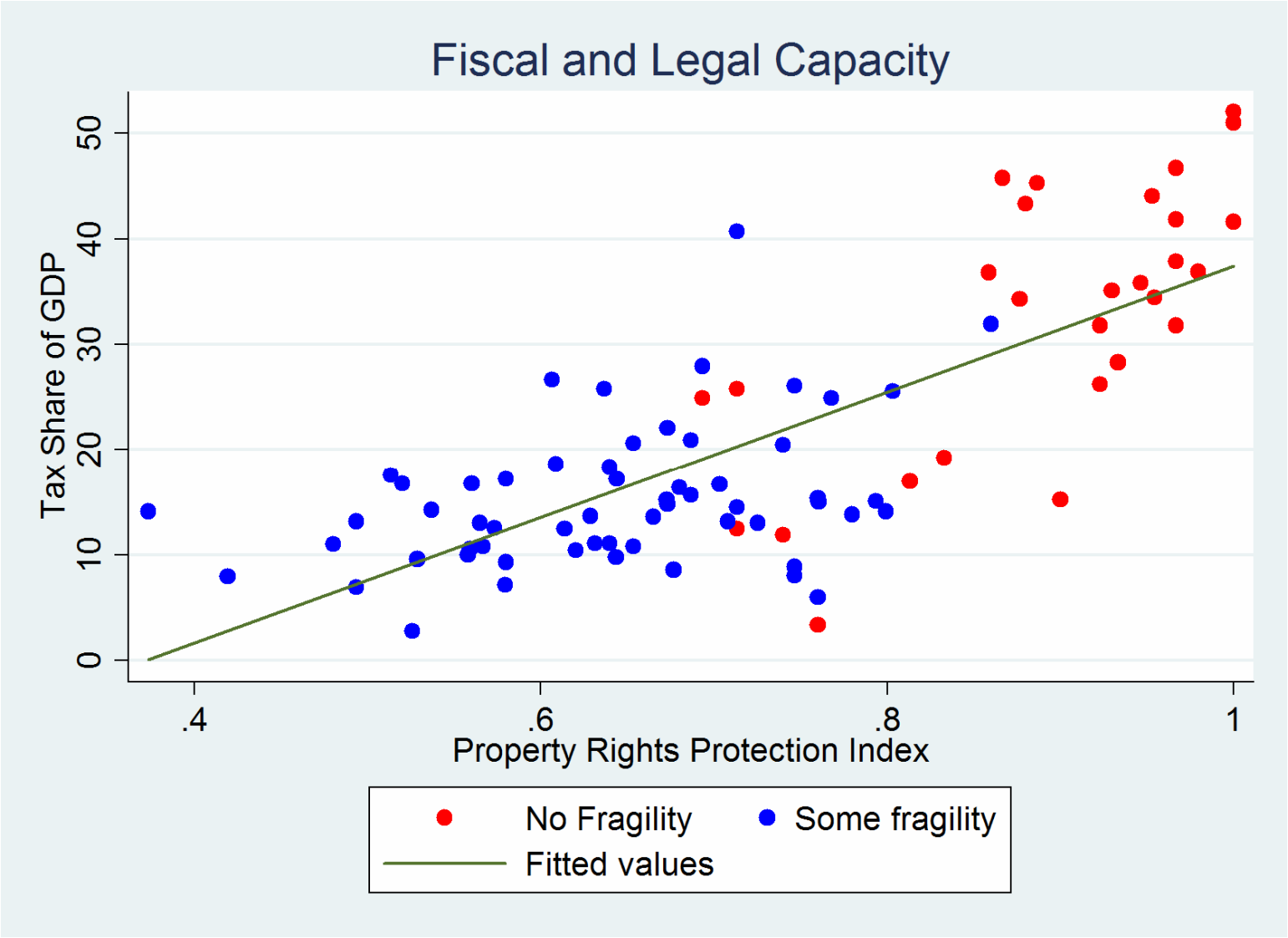


Figure 1.5 Legal and fiscal capacity conditional on fragility

How understand such patterns in the data?

Basically need to pose – and answer – three general questions

Question 1

what forces drive building of different state capacities,
and why do these capacities move together?

Question 2

what forces drive different forms of political violence?

Question 3

what explains clustering of institutions, income, and violence?

Scope of forthcoming book with Tim Besley

Some over-arching objectives

- analyze the politics and economics of state building and political violence in the process of development
- try to understand the observed development clusters of institutions, income, and violence
- aim at constructing new theory and uncovering new evidence
- hope to bring these issues into mainstream of economics

Pool together four broad research agendas

- determinants of long-run development
- determinants of different forms of political violence
- importance of history in explaining today's patterns of development
- interaction of economics and politics in shaping of societies

Background – earlier and ongoing research

"Wars and state capacity", *JEEA*, 2008

"Repression or civil war?", *AER,* Papers and Proceedings, 2009

"The origins of state capacity: Property rights, taxation and politics", *AER*, 2009

"State capacity, conflict and development", *Econometrica,* 2010

"Fragile states and development assistance", *JEEA*, 2011

"The logic of political violence", *QJE*, forthcoming, 2011

"Weak states and steady states: The dynamics of fiscal capacity", mimeo (3rd coauthor Ethan Ilzetzki), 2010

"From trade taxes to income taxes: Theory and evidence on fiscal capacity and development", mimeo, 2010

"Political turnover and institutional reform" (3rd coauthor Marta Reynal-Querol), in preparation

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

- A. Overview
- B. The Core Model of State Capacity
- C. Adding Political Violence
- D. State Spaces
- E. Analyzing Development Assistance
- F. Political Reform
- G. Lessons Learned?

A. Overview

General modeling approach

Analytical building blocks

- two groups that can alternate in power
- distinguish policy and institutions, which constrain policy
- purposeful investments in institutions and in violence

Build analysis successively

- start by simple framework with a single dimension for policy and investment, constrained by number of parameters
- gradually endogenize several of these parameters – i.e., turn them into new endogenous variables
- revisit data as we go along

Quick review of contents of different chapters

Chapter 2 Fiscal capacity – Figure 1.6

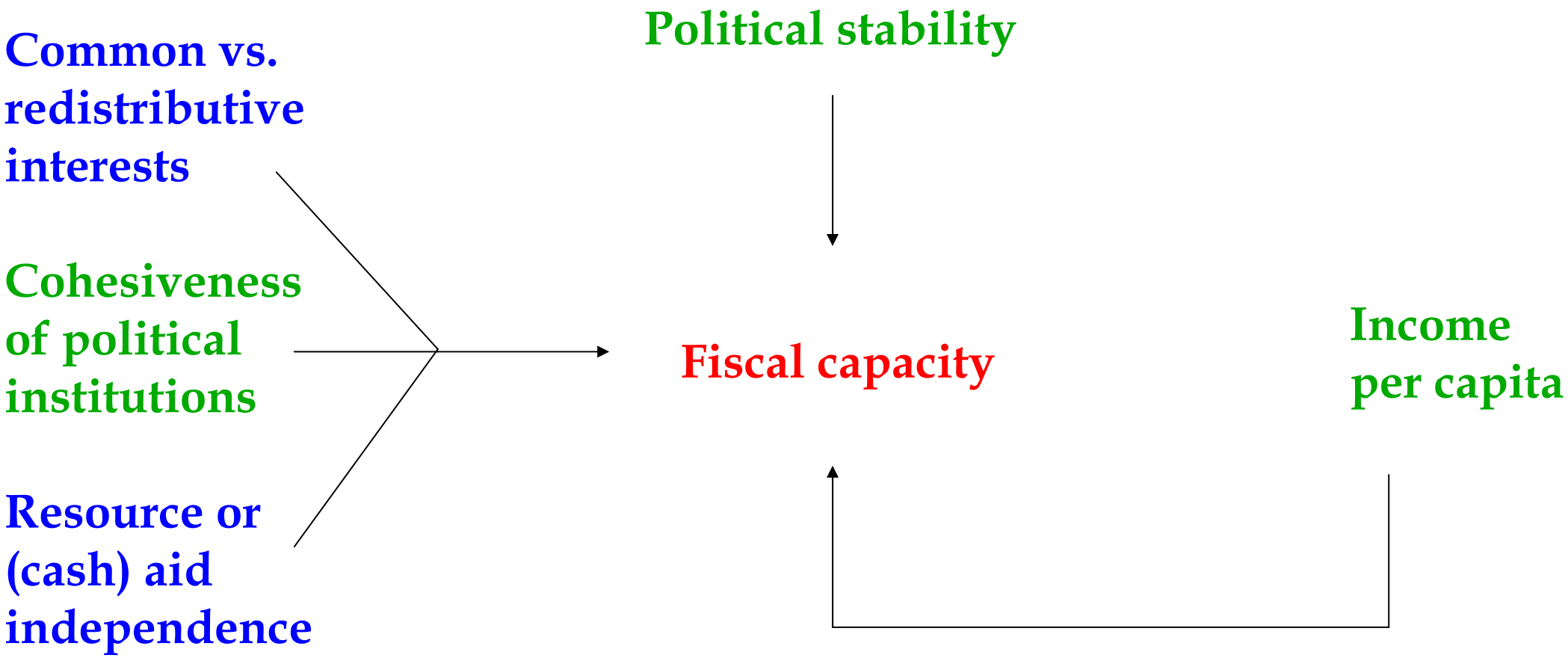
Analyze investments in fiscal (extractive) capacity

- solve simple investment problem under uncertainty
- uncover some proximate and ultimate determinants
- find analytical typology with three types of states

Consider a number of extensions

- microeconomic foundations for fiscal capacity
- more general models of public goods
- polarization/heterogeneity
- income inequality and size asymmetry
- tax distortions
- other tax bases than income
- infinite horizon

Figure 1.6 Scope of Chapter 2



Chapter 3 Legal Capacity – Figure 1.7

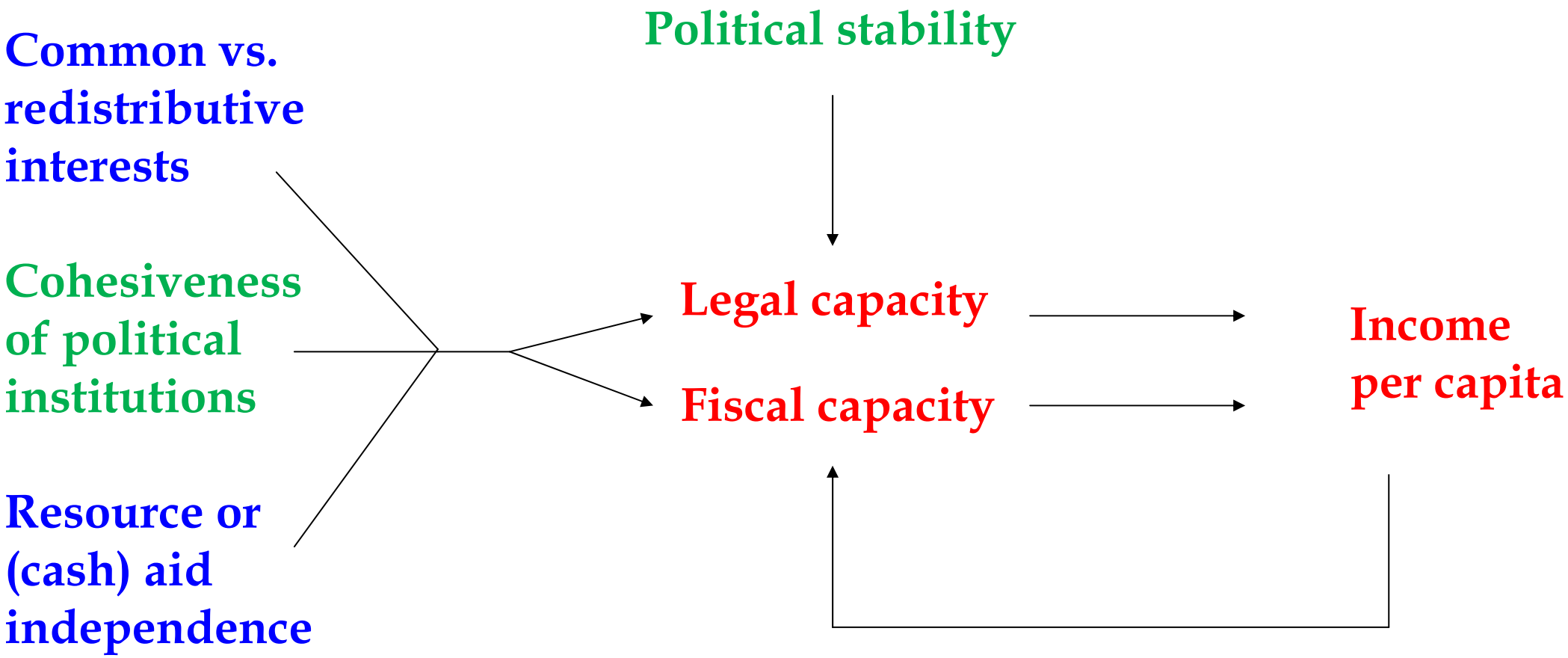
Add investments in legal (productive) capacity

- endogenize income
- demonstrate basic complementarity of investments in different sides of state
- perform comparative statics and look at data

Consider some extensions

- microeconomic foundations for legal capacity, contract enforcement in simple two-sector model
- rents and static production inefficiencies
- additional sources of complementarity
- private capital accumulation
- alternative microfoundations, protection of property rights – and lack such protection in predatory states

Figure 1.7 Scope of Chapter 3



Chapter 4 Political Violence – Figure 1.11

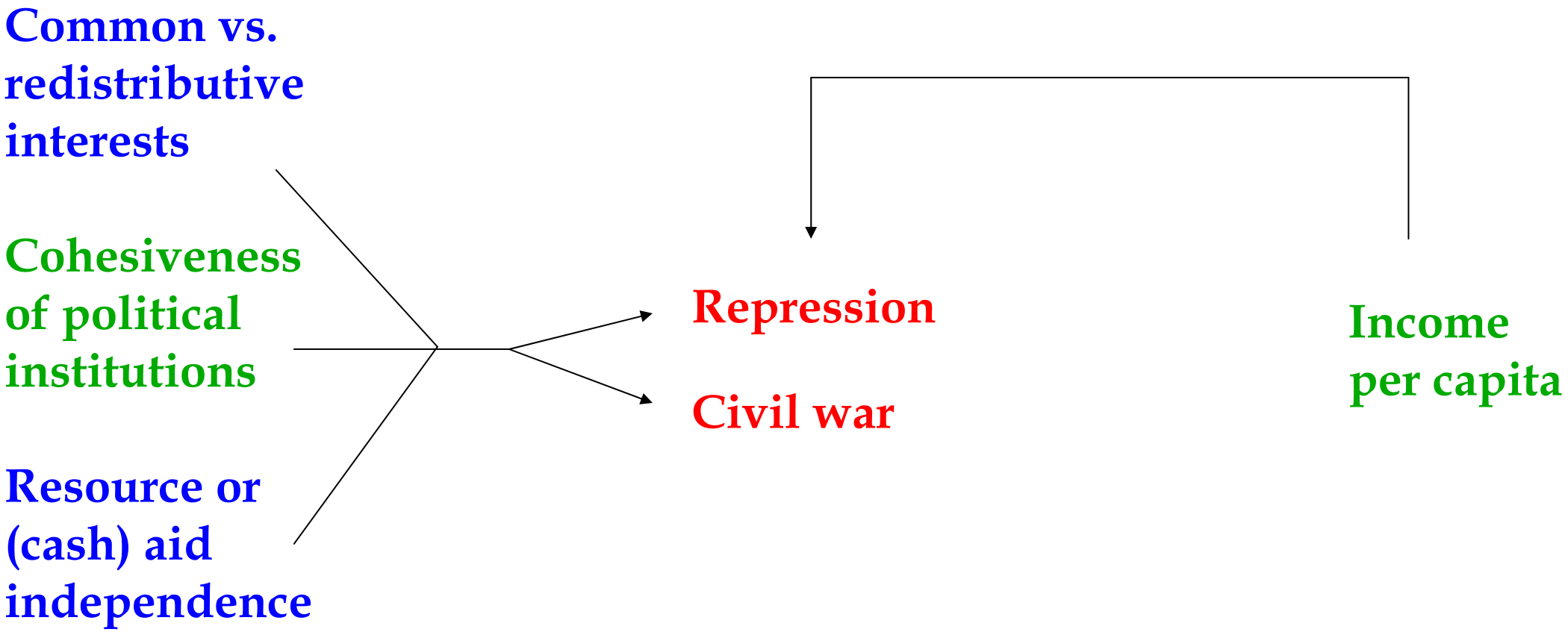
Add investments in political violence to core model

- endogenize political (in)stability
- solve for investments in violence by two groups, for given state capacities
- find analytical typology with three violence states
- uncover determinants of violence

Embark on long empirical detour

- discuss how to go from theory to data
- present econometric results

Figure 1.11 Scope of Chapter 4



Chapter 5 State Spaces – Figures 1.12, 1.14

Put pieces together

- revisit investments in state capacity with endogenous political stability (turnover)
- extensions: polarization, predatory states, private investment with risk of violence
- common determinants and feedback effects can create clusters of strong state capacities in strong economies and peaceful societies, or vice versa
- gives new perspectives on the data

Summarize the analysis that far

- local and global comparative statics imply two-way, state-space matrix, and an *Anna Karenina principle of development*

Figure 1.12 Scope of Chapter 5

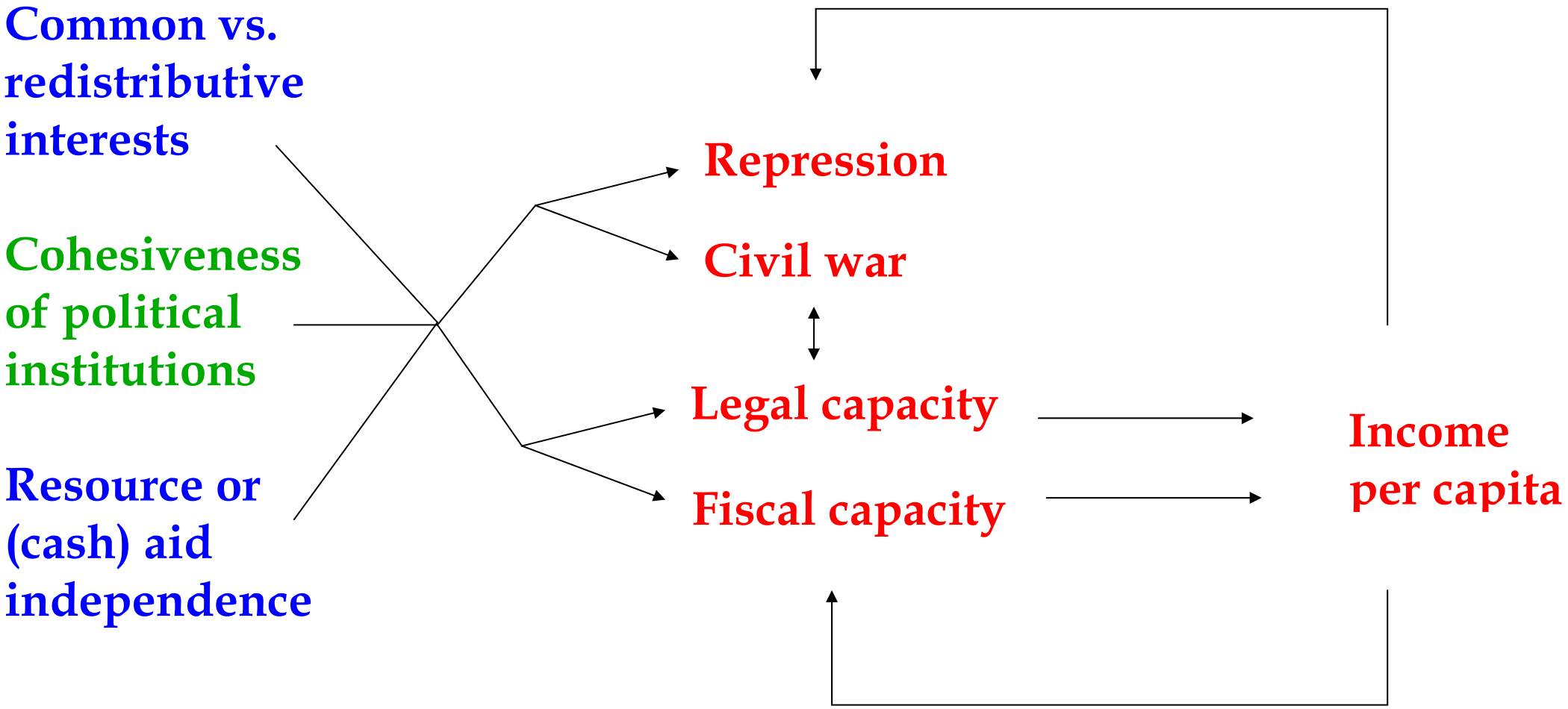


Figure 1.14 Our state space

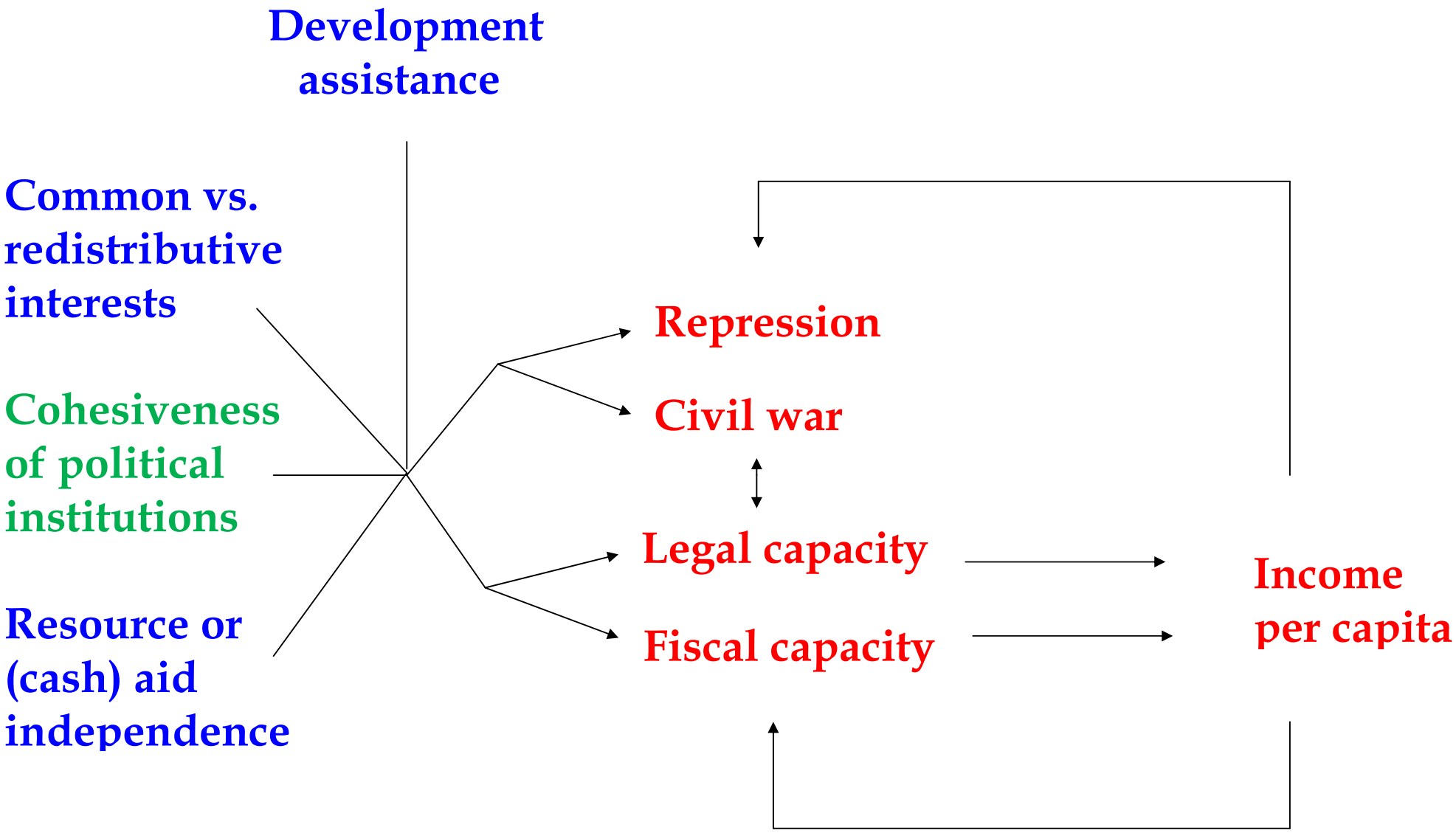
	Weak	Redistributive	Common interest
Peace			
Repression			
Civil war			

Chapter 6 Development Assistance – Figure 1.15

Analyze consequences of development assistance

- use core model to evaluate effects of different forms of assistance in different forms of states
- cost-benefit analysis for donor, with endogenous responses of policy, state-capacity investment and violence
- provide consistent perspective on outside interventions in weak or fragile states

Figure 1.15 Scope of Chapter 6

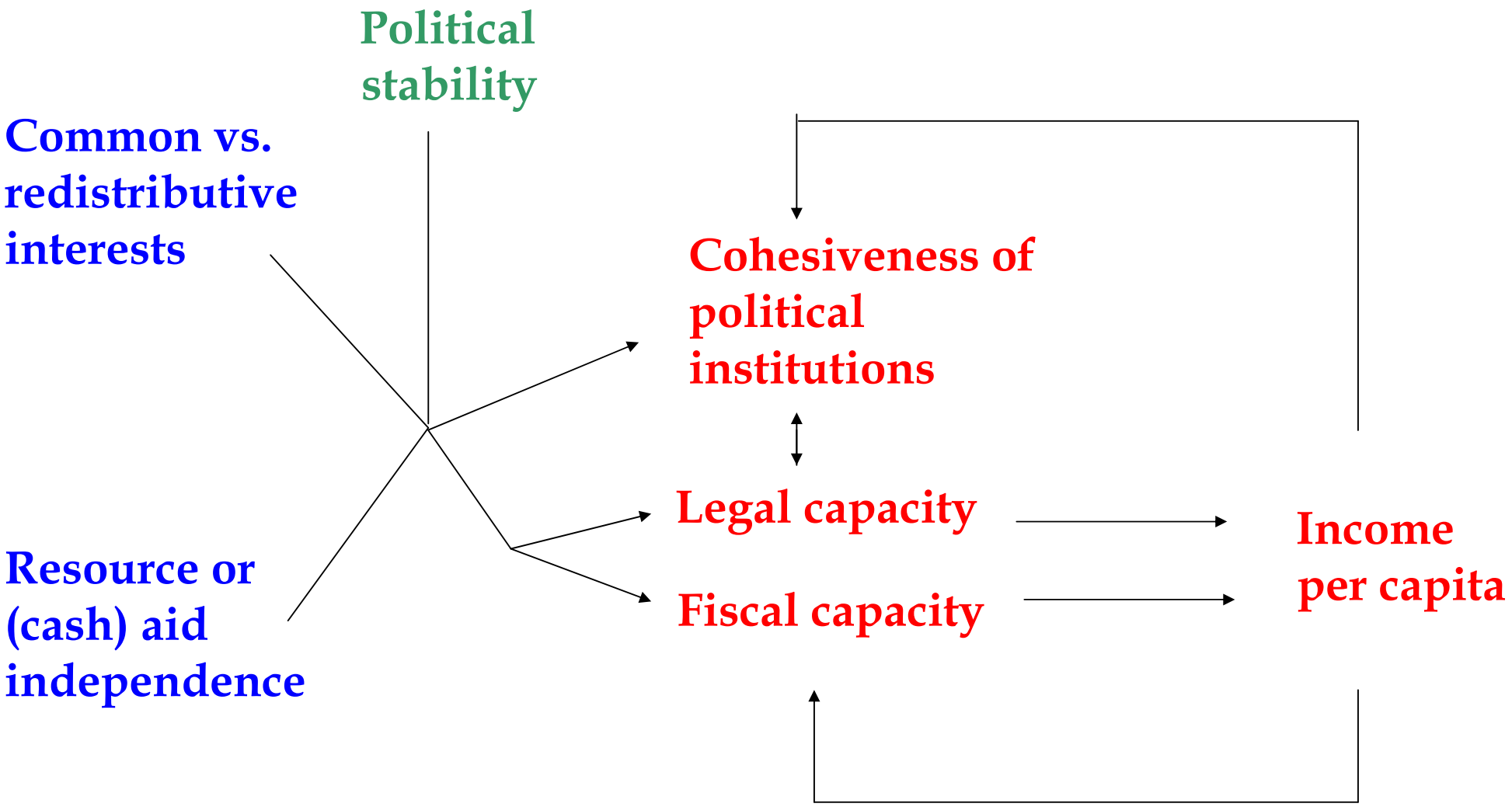


Chapter 7 Political Reform – Figure 1.16

Add possibility of political reform in core model

- cohesiveness of political institutions central determinant of investments in state capacity and violence
- analyze incentives to reform political institutions
- discuss micropolitical foundations
- shed light on stability of strong and peaceful states, or weak and violent states, as well as on observed reforms away from and towards cohesiveness

Figure 1.16 Scope of Chapter 7



B. The Core Model of State Capacity
1. Basic structure

Two time periods, $s = 1, 2$

Two identical groups of individuals, $J = A, B$

- each has share $\frac{1}{2}$ of population size, which is normalized to 1 (asymmetries in ch 2)

Incumbents and opponents

- at beginning of $s = 1$, one group holds power
  - we call this group the incumbent $I_1 \in \{A, B\}$
- the other group is the opponent $O_1 \in \{A, B\}$
- with exogenous probability γ, there is a peaceful transition of power until $s = 2$
- thus γ measures political instability (turnover) (endogenized in chs 4 and 7)

Private utility

Linear utility functions

linear utility buys us risk neutrality

and a model that is *recursive* in policy and investments

$$u_s^J = c_s^J + \alpha_s g_s$$

c_s^J private consumption of group-J member at s

no savings (one of extensions in ch 3)

g_s utility from consumption of public goods, α_s their value;
think about as "defense", and "threat of external conflict"
(adding curvature one extension in ch 2)

Value of public goods

Value of public goods stochastic

α_s has two-point distribution $\alpha_s \in \{\alpha_L, \alpha_H\}$,
where $\alpha_H > 2 > \alpha_L > 1$, and Prob$[\alpha_s = \alpha_H] = \phi$
(continuous distribution one extension in ch 2)

shocks to α iid over time

realization of α_s known when policy set in s

Taxation and fiscal capacity

Government has discretion over current taxation

- taxes income at rate t_s, but is constrained by existing fiscal capacity, i.e., $t_s \leq \tau_s$

Microeconomic foundations (see ch 2)

- individual can earn some income in informal (untaxed) sector, but incentives to hide depend on risk and cost of getting caught

Investments in fiscal capacity

- e.g., tax authority, compliance structures, infrastructure to enforce income tax (or impose value-added tax)
- initial stock τ_1 is given, but can be augmented
- to achieve fiscal capacity τ_2 requires non-negative investment $\tau_2 - \tau_1$ at $s = 1$ (depreciation and reversibility in ch 2)
- convex cost $\mathcal{F}(\tau_2 - \tau_1)$, where $\mathcal{F}_\tau(0) = 0$

Incomes and legal protection

Group J's income s depends on "legal protection" p_s^J

$$y_s^J = y(p_s^J)$$

where y is an increasing function

no tax distortions (but one of extensions in ch 2)

think of p_s^J as "legal protection of group J contracts"
or "legal protection of group J property rights"

Alternative microfoundations in two-sector model (see ch 3)

(i) symmetric credit-market model with partial enforcement of collateralized debt contracts: higher p_s^J, better enforcement

(ii) model of coercive theft from producers of output by other citizens: higher p_s^J, more clamp-down on predatory activity

Legal protection and capacity

Incumbent controls current legal protection

p_s^J constrained by existing legal capacity, i.e., $p_s^J \leq \pi_s$

Investment in legal capacity

e.g., courts, educated judges, credit or property registries

initial stock of legal capacity, π_1, given, but can be augmented by non-negative investment $\pi_2 - \pi_1$

convex costs $\mathcal{L}(\pi_2 - \pi_1)$,where $\mathcal{L}_\pi(0) = 0$

Government budget

Budget items at s

$g_s, t_s, \{r_s^J\}_{J=I,O}$, and m_s total investments

$$m_s = \begin{cases} \mathcal{F}(\tau_2 - \tau_1) + \mathcal{L}(\pi_2 - \pi_1) & \text{if } s = 1 \\ 0 & \text{if } s = 2 \end{cases}$$

budget constraint is

$$R + t_s \frac{y(p_s^I) + y(p_s^O)}{2} = g_s + m_s + \frac{r_s^I + r_s^O}{2}$$

where r_s^J is a non-negative targeted transfer to group J

R is additional (constant) revenue source accruing to government

interpret as natural resource rents, or foreign (cash) aid

R is randomly distributed on support $[R_L, R_H]$

Political institutions

Model as constraint on incumbent

incumbents must give fixed share σ to opposition
of any given unit of transfers to its own group

by the budget constraint

$$r_s^J = \beta^J[R + t_s\frac{y(p_s^I) + y(p_s^O)}{2} - g_s - m_s]$$

where $\beta^I = 2(1-\theta)$ and $\beta^O = 2\theta$ and where O 's share
$\theta = \frac{\sigma}{1+\sigma} \in [0, \frac{1}{2}]$ represents more *cohesive* institutions
the closer is θ to its maximum of $\frac{1}{2}$

interpret as more checks and balances on executive,
or better representation of opposition
(micropolitical foundations in ch 7)

Timing

1. Start out with state capacity $\{\tau_1, \pi_1\}$ and incumbent group I_1, nature determines α_1 and R
2. I_1 chooses a set of first-period policies $\{(p_1^J), (r_1^J), t_1, g_1\}$, and investments in period-2 state capacities τ_2 and π_2.
3. I_1 remains in power with probability $1 - \gamma$, nature determines α_2
4. The new incumbent I_2 chooses current policy $\{(p_2^J), (r_2^J), t_2, g_2\}$

goal is to solve for a subgame-perfect equilibrium in policy,
and state-capacity investments – treat in that order

2. Policy

Policymaking in period s

Policy objective

linearity makes model recursive, so that we can study
policy choice at stages 2 and 4 separately from investments

whoever holds power, chooses $\left\{(p_s^J), (r_s^J), t_s, g_s\right\}$ to maximize

$$\alpha_s g_s + (1 - t_s)\, y(p_s^I) + r_s^I$$

subject to

$$p_s^J, p_s^J \leq \pi_s, \quad t_s \leq \tau_s, \quad r_s^O \geq \sigma r_s^I$$

and the government budget constraint

Optimal policy design?

can be described by four observations

Observation 1 – legal protection

Will legal protection be allocated in same way to each one of the groups – i.e., will there be rule of law?

For $s \in \{1, 2\}$ *any incumbent* I_s, *any* α_s *and any* R, *regulation fully utilizes all legal capacity,* $p^{I_s} = p^{O_s} = \pi_s$

"Obvious" result in the current set up

relates to Diamond-Mirrlees production efficiency and a Political Coase Theorem

this result can be violated, when there are rents (two of extensions in ch 3 entail strong violations)

Observation 2 – public goods

Equilibrium public-good provision

linear preferences give us a "bang-bang", corner solution

the level of public goods provided is

$$G(\alpha_s, t_s) = \begin{cases} R + t_s y(\pi_s) - m_s & \text{if } \alpha_s \geq 2(1-\theta) \\ 0 & \text{if } \alpha_s < 2(1-\theta) \end{cases}$$

depending on whether public goods is worth more to the incumbent than transfers to her own group (1^{st} row), or not (2^{nd} row)

Observation 3 – taxes

Equilibrium tax rate

$$t_s = \tau_s$$

Interpretation

always worthwhile to fully utilize all fiscal capacity, since gain of higher tax rate is, at least, $2(1-\theta)\, y(\pi_s)$, while loss is $y(\pi_s)$

Observation 4 – transfers

Equilibrium transfers to incumbent group

follow from

$$r_s^J = \beta^J \left[R + \tau_s y(\pi_s) - G\left(\alpha_s, \tau_s\right) - m_s \right]$$

Interpretation – recall $\beta^I = 2(1-\theta)$ and $\beta^O = 2\theta$

higher value of the opposition's share, θ, reflects more cohesive political institutions

as stated earlier, this may reflect more minority protection by constitutional checks and balances, or more representation through PR elections or parliamentary form of government

if $\theta = 1/2$, transfers shared equally across the two groups

Indirect utility and value functions

Plug in optimal policy in utility at s to get

$$W(\alpha_s, \tau_s, \pi_s, m_s, \beta^J) = \alpha_s G(\alpha_s, \tau_s) + (1-\tau_s) y(\pi_s) + \beta^J [R + \tau_s y(\pi_s) - G(\alpha_s, \tau_s) - m_s]$$

period s utility of group J

Define "value functions"

$$U^I(\tau_2, \pi_2) = \phi W(\alpha_H, \tau_2, \pi_2, 0, \beta^I) + (1-\phi) W(\alpha_L, \tau_2, \pi_2, 0, \beta^I)$$

and

$$U^O(\tau_2, \pi_2) = \phi W(\alpha_H, \tau_2, \pi_2, 0, \beta^O) + (1-\phi) W(\alpha_L, \tau_2, \pi_2, 0, \beta^O)$$

for being incumbent or opposition group in period 2
depending on the two state variables

3. Investments in State Capacity

Preliminaries

Investment objective is

$$W(\alpha_1, \tau_1, \pi_1, \mathcal{F}(\tau_2 - \tau_1) + \mathcal{L}(\pi_2 - \pi_1), 2(1-\theta))$$
$$+(1-\gamma)U^I(\tau_2, \pi_2) + \gamma U^O(\tau_2, \pi_2)$$

What's the shadow cost of public funds for incumbent?

value *realized* in period 1

$$\lambda_1 = \max\{\alpha_1, 2(1-\theta)\}$$

and value *expected* for period 2

$$E(\lambda_2) = \phi\alpha_H + (1-\phi)\lambda_2^L$$

where

$$\lambda_2^L = \begin{cases} \alpha_L & \text{if } \alpha_L \geq 2(1-\theta) \\ 2[(1-\theta)(1-\gamma) + \gamma\theta] & \text{otherwise} \end{cases}$$

Euler equations

First-order conditions

for fiscal and legal capacity are

$$y(\pi_2)[(E(\lambda_2)-1] \lessgtr \lambda_1 \mathcal{F}_\tau (\tau_2 - \tau_1)$$
$$\text{c.s.} \quad \tau_2 - \tau_1 \gtrless 0$$

$$y_\pi(\pi_2)[1+(E(\lambda_2)-1)\tau_2] \lessgtr \lambda_1 \mathcal{L}_\pi (\pi_2 - \pi_1)$$
$$\text{c.s.} \quad \pi_2 - \pi_1 \gtrless 0$$

Marginal cost of investment – RHS

period-1 foregone consumption of public or private goods

Marginal net benefit of investment – LHS

collect any direct effect on period-2 private income plus indirect effects via the government budget

When is investment positive?

Because $\mathcal{F}_{\tau}(0) = \mathcal{L}_{\pi}(0) = 0$, it is sufficient that

$$E(\lambda_2) - 1 \geq 0$$

expected value of public funds must to be large enough

this depends on key parameters: $\{\phi, \alpha_H, \alpha_L, \theta, \gamma\}$

Immediate interim agenda

analyze optimal investment

understand how it depends on the model parameters

Two conditions

To pin down the type of equilibrium, define

***Cohesiveness*:** $\alpha_L \geq 2(1-\theta)$

requires θ close enough to $1/2$ or large enough α_L
i.e., strong enough common-interest vs. redistributive motives

guarantees that $E(\lambda_2) - 1 \geq 0$

***Stability*:** $\phi\alpha_H + (1-\phi)\,2\left[(1-\gamma)(1-\theta) + \gamma\theta\right] \geq 1$

relevant only when Cohesiveness fails – depends on γ
e.g., holds as $\gamma \to 0$ even if $\phi \to 0$

also guarantees that $E(\lambda_2) - 1 \geq 0$

These conditions uniquely define three possible outcomes

Three types of state

Proposition 2.2 *If Cohesiveness holds, then the outcome is a* ***common-interest state*** *(the same as chosen by a Pigouvian planner). Public goods are provided for any* α_s *and there is positive investment in fiscal and legal capacity*

Proposition 2.3 *If Cohesiveness fails, while Stability holds, the state is* ***redistributive****. Public revenues finance only transfers when* $\alpha_s = \alpha_L$ *and the state invests in both fiscal and legal capacity*

Proposition 2.4 *If Cohesiveness and Stability fail, the state is* ***weak*** *with no investments in fiscal capacity and lower investments in legal capacity than in a common-interest or redistributive state*

this is one dimension of our state-space (Anna Karenina) matrix

Complementarity and supermodularity

Complementarity

a further consequence of $E(\lambda_2) - 1 \geq 0$

has two important implications

Substance

higher π raises motives to invest in τ and vice versa

Analytical convenience – monotone comparative statics

supermodularity holds (by positive cross-partial)

if reduced-form objective function $n(\tau_2, \pi_2; \varphi)$ supermodular in (τ_2, π_2), then (τ_2, π_2) monotonically increasing in φ if $\partial^2 n(\cdot)/\partial\tau_2\partial\varphi \geq 0$ and $\partial^2 n(\cdot)/\partial\pi_2\partial\varphi \geq 0$

very easy to derive effects of most parameter shifts

4. Comparative Statics
Value of public goods

Proposition 3.2 *Higher expected demand for public goods raises investments in state capacity in common-interest and redistributive states*

$$\frac{\partial E(\lambda_2)}{\partial \phi} = \alpha_H - \lambda_2^L > 0$$

common interests make fiscal capacity more valuable

external conflict promotes fiscal capacity and legal capacity
consistent with historical work by Hintze, Tilly and others,
but augmented prediction for productive side of government

Political instability and cohesiveness

Proposition 3.3 *Investment in fiscal and legal capacity are promoted by lower political instability if institutions are not cohesive*

lower γ raises the likelihood that Stability holds and increases λ_2^L if it does hold

this effect is stronger, the more non-cohesive political institutions

case study of England in 18th century: after Glorious Revolution (higher θ), Whigs rule for many decades (high γ), great expansion of tax capacity, and more independent and well-paid judiciary (higher τ, π)

more cohesiveness has an uncertain effects on state capacity in redistributive state, but raise probability of common-interest state

Costs of investments

Proposition 3.4 *Lower costs of either legal or fiscal capacity raise investments in legal and fiscal capacity in common-interest and redistributive states*

a downward multiplicative shift of $\mathcal{L}(\cdot)$ or $\mathcal{F}(\cdot)$ cuts the RHS of investment FOCs for given π_2 and τ_2

this gives a theoretical rationale for "legal origins" hypothesis, but with an auxiliary prediction for fiscal capacity

Exogenous growth and income

Exogenous productivity differences

$$y_s^J = \Lambda_s y\left(p_s^J\right)$$

perhaps due to geography or Hicks-neutral technology

Proposition 3.5 *More productive economies (higher Λ_2) choose greater investments in fiscal and legal capacity in common-interest and redistributive states.*

higher Λ_2 raises $\Lambda_2 y(\pi_2)$ and $\Lambda_2 y_\pi(\pi_2)$ for given π_2, which makes both types of investments in the state more worthwhile

Resource or aid dependence

Define equilibrium GDP in period s as

$$Y(\pi_s, R) = R + \frac{\Lambda_s(y(\pi_s) + y(\pi_s))}{2}$$

and consider variations in R and $\Lambda_s y(\pi_s)$ that keep $Y(\pi_s, R)$ constant

Corollary *Higher resource or aid dependence, higher R for given $Y(\pi_2, R)$, means lower investments in legal and fiscal capacity in common-interest and redistributive states*

clue why some aid or resource-dependent countries in Africa and South Asia may have weak incentives to build their states

consistent with idea of "rentier states"

Endogenous growth

The model also has "endogenous" growth

- income grows due to investments in legal capacity
  - whatever the source of these investments

$$\frac{Y(\pi_2, R) - Y(\pi_1, R)}{Y(\pi_1, R)}$$

- growth driven by institutional deepening leading to more efficient private markets, when $\pi_2 > \pi_1$
- by complementarity, (expected) government size grows together with legal capacity and income

Clustering of state capacity and income – Figure 3.1

Strong positive associations

- recall correlations in Figure 1.3
- similar picture appears with alternative measures:
  - income tax share in government revenue (IMF, late 1990s)
  - vs. index of contract enforcement (World Bank, 2005)

Earlier results shed light on observed clustering

- positive correlation can reflect higher (exogenous) income causing higher state capacity
- but may also reflect other factors that lead to higher state capacity, which – in turn – spills over into higher (endogenous) income

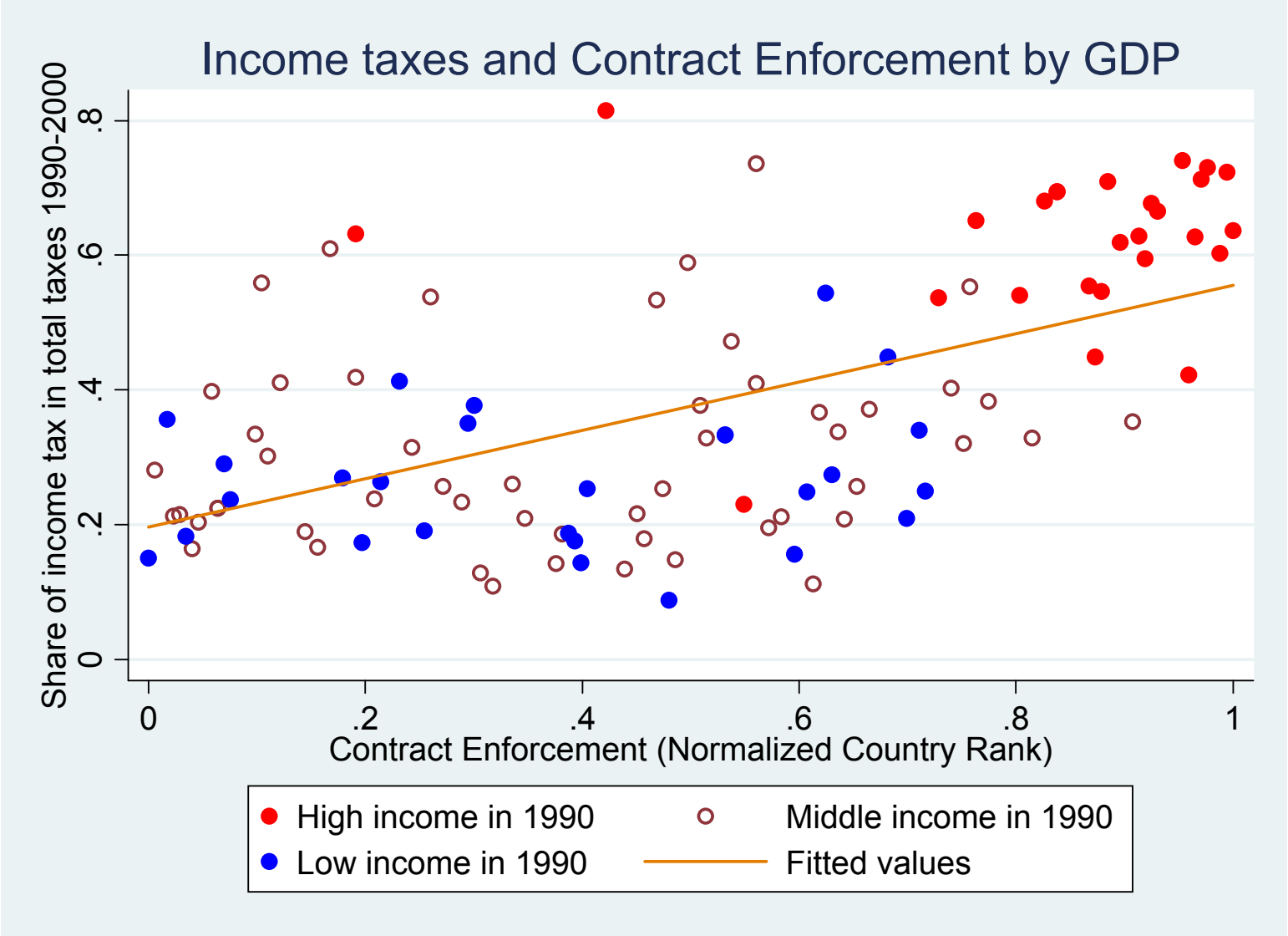


Figure 3.1 Income taxes and contract enforcement conditional on GDP

Extension: Polarization/heterogeneity

Different valuations of public goods across groups

assume drawn from same two-point distribution $\{\alpha_H, \alpha_L\}$

$\left\{\alpha_s^I, \alpha_s^O\right\}$ period-s realizations for groups I and O and

$$(1-\iota) = \text{Prob}\left\{\alpha_s^O = z | \alpha_s^I = z\right\} \leq 1$$

greater polarization/heterogeneity, higher ι, gives lower expected value of public funds

$$\frac{dE(\lambda_2)}{d\iota} = -\gamma\phi(\alpha_H - \alpha_L) < 0$$

Proposition 2.5 *If Cohesiveness fails, more polarization (higher ι) decreases fiscal and legal capacity-investments in redistributive states, and raises the likelihood of a weak state. Both effects are larger with greater political instability (higher γ)*

5. Data and Partial Correlations

Measuring state capacity

Five proxies for fiscal capacity (IMF and World Bank data)

- ratio of total tax revenue to GDP, at end of 1990s
- share of income taxes in total revenue, at end of 1990s
- share of *non*-trade taxes in revenue at end of 1990s
- difference between income-tax and trade-tax share
- 1− (share of informal economy in GDP around 2006)

Five proxies for legal capacity (ICRG and World Bank data)

- index of government anti-diversion policy, end of 1990s
- normalized rank on Doing Business indicators, circa 2006
- normalized rank on ease of registering property
- normalized rank in the ease of access to credit
- normalized rank on a measure of enforcing contracts

Measuring parameters of the model

Use various proxies

common interests: proportion years in external war from 1816 (or independence) until 2000 (Correlates of War data)

polarization: 1− (degree of ethnic fractionalization) (Fearon 2003 data on (0,1))

cohesive institutions: average from 1800 (or independence) to 2000 of constraints on executive ("Xconst" in Polity IV data, 1-7 scale normalized to (0,1))

political stability: same period average of non-open and non-competitive recruitment of executive (normalized (0,1) score for "Xrcomp"+"Xropen" in Polity IV)

investment costs: legal origin indicators (La Porta et al 1998)

Partial correlations – Figures and tables

Compute partial correlations

- regress measure of state capacity on suggested determinants; of course, absolutely no claim of causal interpretation

Basic correlations in line with theory

- for different measures of fiscal as well as legal capacity

Auxiliary predictions of theory?

- interaction effects are mixed success
- additional measures implied by extensions (in ch 3) – private investments, private credit, corruption – also correlated with basic determinants in line with model predictions

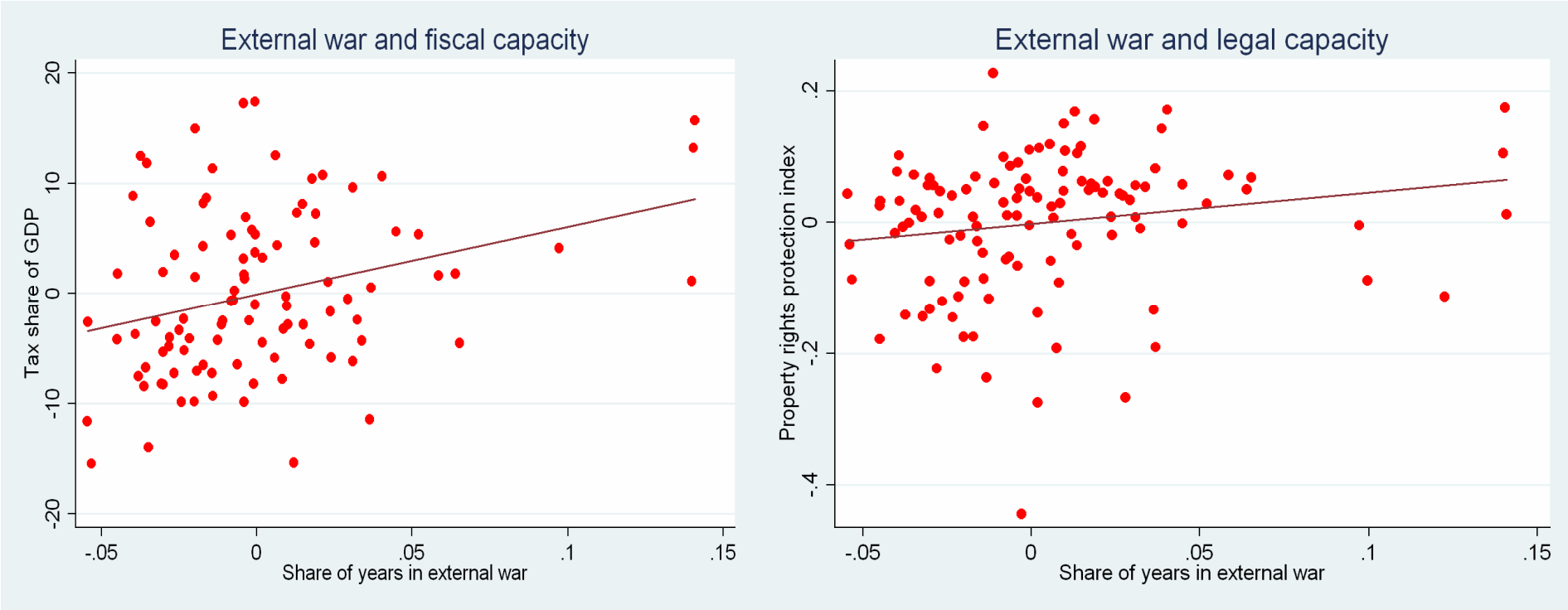


Figure 1.8 State capacity and external war

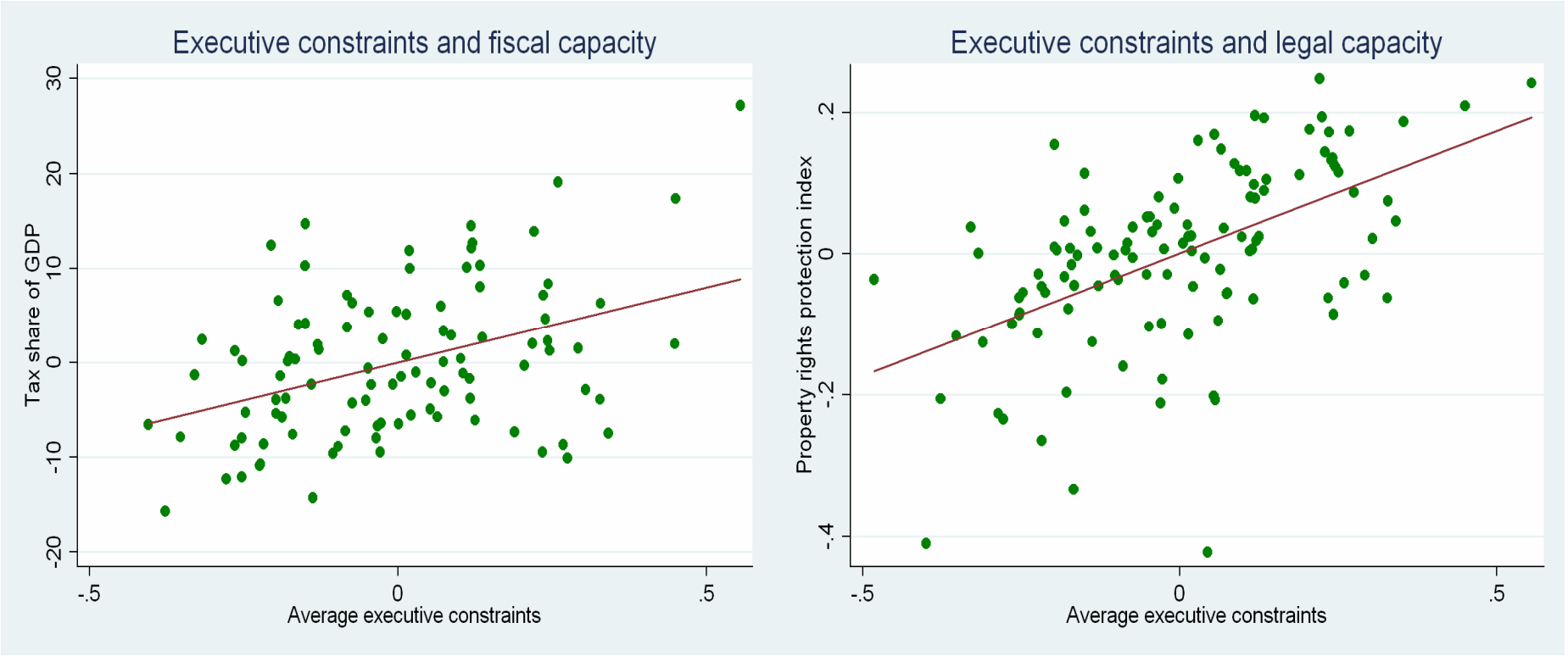


Figure 1.9 State capacity and executive constraints

Table 2.1 Correlations between fiscal capacity measures

	Tax revenue share in GDP	Income tax share	Non-trade tax share	Income tax bias	Formal sector share
Tax revenue share in GDP	1.000				
Income tax share	0.815	1.000			
Non-trade tax share	0.729	0.693	1.000		
Income tax bias	0.846	0.954	0.878	1.000	
Formal sector share	0.564	0.587	0.580	0.624	1.000

Table 2.2 Fiscal Capacity and Covariates: Simple Correlations

	(1) Tax revenue share in GDP in 2000	(2) Income tax share in 2000	(3) Non-trade tax share in 2000	(4) Income tax bias in 2000	(5) Formal sector share around 2000
Prevalence external war before 2000	1.897*	1.213	2.387**	1.972**	1.671**
	(1.142)	(0.952)	(0.915)	(0.965)	(0.690)
Average executive constraints before 2000	2.130***	2.309***	1.135***	2.001***	1.768***
	(0.374	(0.335)	(0.312)	(0.307)	(0.356)
Average non-open executive recruitment before 2000	1.080**	1.254***	0.541	1.054***	1.490***
	(0.432)	(0.451)	(0.391)	(0.392)	(0.447)
Ethnic homogeneity (1 - ethnic fractionalization)	1.058***	0.438	0.656**	0.606**	0.709**
	(0.300)	(0.271)	(0.304)	(0.270)	(0.298)
Observations	104	104	103	103	109
R-squared	0.503	0.465	0.301	0.482	0.317

Notes: Robust standard errors in parentheses: (* significant at 10%; ** significant at 5%; *** significant at 1%)

Table 2.4 Fiscal Capacity and Covariates: Additional Controls

	(1) Tax revenue share in GDP	(2) Income tax share in total revenue	(3) Formal sector share	(4) Tax revenue share in GDP	(5) Income tax share in total revenue	(6) Formal sector share
Prevalence external war before 2000	1.536	0.884	1.203*	0.819	0.583	1.484**
	(1.076)	(0.867)	(0.660)	(1.341)	(0.860)	(0.659)
Average executive constraints before 2000	1.595***	1.757***	0.891**	1.163**	1.240***	1.131**
	(0.415)	(0.383)	(0.397)	(0.452)	(0.402)	(0.429)
Average non-open executive recruitment before 2000	0.686*	0.866**	0.989**	0.891*	0.473	1.249**
	(0.408)	(0.410)	(0.428)	(0.474)	(0.396)	(0.475)
Ethnic homogeneity (1 - ethnic fractionalization)	0.718*	0.085	- 0.010	0.423	0.024	0.084
	(0.368)	(0.339)	(0.372)	(0.384)	(0.322)	(0.397)
Log(GDP per capita) in 2000	0.209**	0.221**	0.398***	0.350***	0.342***	0.378***
	(0.105)	(0.099)	(0.106)	(0.112)	(0.083)	(0.117)
Low value of inequality				0.513*	0.321**	- 0.182
				(0.297)	(0.151)	(0.191)
Observations	103	103	109	83	83	90
R-squared	0.531	0.496	0.404	0.591	0.570	0.480

Notes: Robust standard errors in parentheses: (* significant at 10%; ** significant at 5%; *** significant at 1%)

Table 3.1 Correlations between legal capacity measures

	Government Anti-diversion Policy	Doing Business	Registering Property	Obtaining Credit	Contract Enforcement
Government Anti-diversion Policy	1.000				
Doing Business	0.8010	1.000			
Registering Property	0.5082	0.5670	1.000		
Obtaining Credit	0.6680	0.7879	0.4360	1.000	
Contract Enforcement	0.7277	0.7062	0.3851	0.4069	1.000

Table 3.2 Legal Capacity and Covariates: Simple Correlations

	(1) Government Anti-Diversion Policy	(2) Doing Business	(3) Registering Property	(4) Obtaining Credit	(5) Contract Enforcement
Prevalence external war before 2000	1.294**	0.427**	0.278	0.355*	0.749***
	(0.580)	(0.185)	(0.441)	(0.203)	(0.230)
Average executive constraints before 2000	2.085***	0.535***	0.222*	0.358***	0.287***
	(0.291)	(0.084)	(0.122)	(0.092)	(0.108)
Average non-open executive recruitment before 2000	1.467***	0.235**	0.229	- 0.082	0.202*
	(0.303)	(0.109)	(0.152)	(0.114)	(0.09)
Ethnic homogeneity	1.079***	0.241***	0.257***	0.286***	0.104
	(0.259)	(0.073)	(0.091)	(0.089)	(0.096)
English Legal Origin	- 0.157	0.148***	0.106*	0.062	0.103*
	(0.189)	(0.050)	(0.064)	(0.054)	(0.054)
Scandinavian Legal Origin	0.706***	0.276***	0.327***	0.127	0.452***
	(0.204)	(0.067)	(0.079)	(0.081)	(0.069)
German Legal Origin	0.627***	0.280***	0.244***	0.219***	0.365***
	(0.185)	(0.054)	(0.079)	(0.051)	(0.063)
Socialist Legal Origin	0.013	0.062	0.155**	- 0.007	0.265***
	(0.153)	(0.050)	(0.059)	(0.059)	(0.053)
Observations	122	147	147	147	147
R-squared	0.623	0.552	0.293	0.414	0.442

Notes: Robust standard errors in parentheses: (* significant at 10%; ** significant at 5%; *** significant at 1%). French legal origin is the omitted category.

Table 3.4 Other Outcomes and Covariates: Simple Correlations

	(1) Private Credit to GDP	(2) Corruption Perceptions	(3) Private Investment Rate	(4) Tax Revenue Share in GDP	(5) Income Tax Share in Total Revenue	(6) Formal Sector Share
Prevalence external war before 2000	2.490***	2.130***	0.132	3.227***	2.056*	2.159***
	(0.571)	(0.495)	(0.659)	(1.160)	(1.100)	(0.807)
Average executive constraints before 2000	1.729***	1.799***	0.906***	1.491***	1.690***	1.485***
	(0.331)	(0.275)	(0.260)	(0.420)	(0.421)	(0.375)
Average non-open executive recruitment before 2000	1.099**	0.870***	0.751**	0.640	0.849*	1.249***
	(0.429)	(0.310)	(0.356)	(0.388)	(0.473)	(0.471)
Ethnic homogeneity	0.489	0.693***	0.991***	0.650**	0.171	0. 549
	(0.301)	(0.254)	(0.216)	(0.311)	(0.283)	(0.353)
English Legal Origin	0.131	0.078	0.298*	0.047	0.225	0.089
	(0.218)	(0.156)	(0.161)	(0.178)	(0.183)	(0.233)
Scandinavian Legal Origin	- 0.346	1.719***	0.154	1.966***	1.114***	0.499**
	(0.41)	(0.212)	(0.212)	(0.348)	(0.293)	(0.215)
German Legal Origin	1.618***	1.117***	0.272	0.677*	1.273***	0.892**
	(0.407)	(0.231)	(0.232)	(0.359)	(0.219)	(0.221)
Socialist Legal Origin	N/A	-0.376***	0.268*	-1.027***	- 0.308	- 0.172
		(0.120)	(0.146)	(0.171)	(0.450)	(0.239)
Observations	96	147	154	104	104	109
R-squared	0.633	0.643	0.332	0.630	0.554	0.375

Notes: Robust standard errors in parentheses: (* significant at 10%; ** significant at 5%; *** significant at 1%). French legal origin is the omitted category.