Political Economy, Institutions and Development. Lecture 1: Introduction, Overview and Modeling of Elite Control

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Introduction

- What is this course about?
  - Political economy
  - Economic development
  - Their intersection and interaction

Why?

- Much of economics takes preferences, technology and *institutions* (market structure, laws, regulations, policies) as given.
- Thus institutions matter in the same way as preferences do.
- But in general, in the background
- Increasing body of evidence that for understanding economic development both over time and across countries, we need to understand *institutional differences*.
- For example, growth accounted by human capital, physical capital and "technology". But where do these come from?

The Challenge of Institutions

- Suppose institutions matter (not a minor supposition, but see the evidence later in this lecture).
  - Imagine for example that different laws and regulations, different political systems have a major effect on investment, education and allocation decisions and thus on economic development.
- But why do societies choose different institutions?
- And what are institutions anyway?

What Are Institutions

- Loosely defined in general.
  - Could be anything.
  - The challenge is to find a good workable and useful definition.
- Douglass North: role of institutions as "to reduce uncertainty by establishing a stable (but not necessarily efficient) structure to human interaction."
- But what does this mean?

Institutions: A First Definition

- Let us take another definition from Douglass North as a starting point:

  "Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction."

- Key points: institutions are
  - are humanly devised
  - set constraints
  - shape incentives
- Economic institutions$\longrightarrow$ economic rules of the game (property rights, contracting institutions)
- Political institutions$\longrightarrow$ political rules of the game (democracy versus dictatorship, electoral laws, constraints)
- Not perfect, but will become clearer in the context of well-defined formal models.

How to Model Institutions?

- This is a key question for this course.
- Ideal approach:
  - good approximation to reality and the forces shaping institutional differences
  - amenable to formal theoretical and econometric analysis

Some Approaches

1. *Efficient institutions view*: Society or the economic agents will choose whichever set of institutions and regulations will maximize the size of the "pie".
2. *The Social conflict view:* Institutions emerge as a result of economic agents' *conflicting preferences*. They are not necessarily efficient.
   North: there is a: "persistent tension between the ownership structure which maximizes the rents to the ruler (and his group) and an efficient system that reduces transaction costs and encourages economic growth".
   Why are institutions not "efficient"? Notion of efficiency: Pareto efficiency? Growth maximizing?
   Major barrier to efficiency: *commitment problems*.
3. *The ideology/beliefs view:* Different institutions chosen as a result of different beliefs. But where do beliefs come from?
4. *The incidental institutions view:* Institutions emerge as a byproduct of other interactions. *Historical accidents.*

Institutions and Political Economy

- Political economy intimately related to the *social conflict view*.
  - How are conflicting preferences of different agents aggregated?
  - How do political institutions affect aggregation?
  - How do conflicting preferences over outcomes imply *conflicting preferences over institutions*?
  - How are different preferences over institutions resolved?
- Much on this course will be about trying to develop models and language for investigating these issues.

Institutions: Formal Versus Informal

- Formal institutions, for example, whether the country in question has a Supreme Court, separation of power, parliamentary system etc.
- Informal institutions, which determine how a given set of formal rules and informal institutions function in practice. For example, many Latin American countries have a presidential system similar to the U.S., but in practice, they have very different "political institutions".
- Example: Supreme Court under FDR and Juan Perón (see below).
- But informal institutions should not be used as a "catchall". We have to understand why a given set of formal rules imply different outcomes in different societies.

Political Power

- How are conflicting preferences reconciled?
- *Political power*.
- In the case of South Africa the resolution of social conflict was simple: whites could vote and determine the law, blacks could not.
  - The major issue for the Boer republics of the Transvaal and the Orange Free State at the foundation of the Union of South Africa in 1910 was to stop Africans voting, and similarly this became the basis of the Apartheid regime after the founding of the Union of South Africa.
- Whites have more political power because it is their preferences that count.

De Jure vs. De Facto Political Power

- Distinguish between two different types of political power: *de jure* and *de facto* political power.
  - De jure political power is allocated by political institutions (such as constitutions or electoral systems)
  - De facto political power emerges from the ability to engage in collective action, use brute force, paramilitaries, armies, or other channels such as lobbying or bribery.
- Equilibrium outcomes (institutions/policies) will be an outcome of total political power, which consists of the composition of these two sources of power.
- De facto political power useful for understanding why formal institutions function differently in different environments.

De Facto Power in Action: Perón and Menem

- When Perón was first democratically elected president in 1946 the Supreme Court had ruled unconstitutional an attempt to create a new national labor relations board. Perón sought the impeachment of 4 or the 5 members of the Court. In the end 3 were removed and the Chamber of Deputies and the Senate supported this.
- The 1946 impeachment established a new norm so that whenever a political transition took place, the incoming regime either replaced the entire existing Supreme Court or impeached most of its members.
- In 1990 when the first transition between democratically elected governments occurred, Menem complained that the existing Supreme Court, which had be appointed after the transition to democracy in 1983 by the Radical President Alfonsín, would not support him. He then proposed an expansion of the Court from 5 to 9 members which was duly passed and allowed him to name 4 new judges.

De Facto Power in Action: FDR

- Contrast with Roosevelt.
- During his first presidency, the supreme court began ruling key elements of the New Deal unconstitutional.
- Roosevelt responded by proposing that all judges over the age of 70 should be retired (the ones that opposed him). Though the Democrats had big majorities in both houses and Roosevelt had a huge mandate (like Perón), this was widely regarded as an attack on the independence of the court and he had to back down.
- Same "formal institutions" and thus the same "de jure power". Difference? In "de facto power" or "informal institutions".

Social Conflict in Action

- In 1911 in South Africa the Mines and Works Act extended a 'colour bar' which stopped Africans from taking specific occupations in the mining industry. The colour bar was extended to the whole economy after 1926 (it was repealed in 1984).
- The effect of the colour bar was to reduce the competition that skilled white workers faced and increase the supply of unskilled workers, thus driving down their wage. The net effect was to redistribute income massively from blacks to whites.
- Notice that from an economic point of view this institution was very inefficient impeding as it did the allocation of resources and undermining the incentives of Africans.

Social Conflict in Action (continued)

Table 4.1. *1904 schedule of skilled trades and occupations reserved for European workers*

amalgamator	engineer	painter
assayer	engine-driver	patternmaker
banksman	fireman-overseer	pipeman
blacksmith	fitter	plasterer
boiler-maker	ganger	plate-layer
brass-finisher	ironmoulder	plumber
brassmoulder	joiner	pumpman
bricklayer	machine rockdriller	quarryman-overseer
brickmaker	machine sawyer	rigger
carpenter	machinist	sampler
clerk	mason	signaller
coppersmith	mechanic	skipman
cyanide shiftsman	miller	stonecutter
drill sharpener	millwright	timberman
driver of air	mine carpenter	timekeeper
or steam winch	mine overseer	tinsmith
driver of mechanical	mine storeman	turner
or electrical machinery	onsetter	wiresplicer
electrician	overseer[a]	woodworking machinist

[a] In any capacity other than the management and control of labourers.

Social Conflict in Action (continued)

Table 3.3. *Nominal and real earnings per shift worked of African workers on the gold mines, 1911–61*

	(1) Earnings (including food)	(2) Retail price index	(3) Index of real earnings
	(cents)	(1911=100)	
1911	24	100	100
1916	24	116	86
1921	28	168	69
1926	26	136	80
1931	25	128	82
1936	26	120	90
1941	28	138	85
1946	37	171	90
1951	45	218	86
1956	56	263	89
1961	62	293	88

Source: (1) Wilson, *Labour*, p. 66; (2) *Union statistics*, H-23; (3) = (1) ÷ (2) converted to index with 1911=100.

Social Conflict in Action (continued)

South Africa in international perspective 11

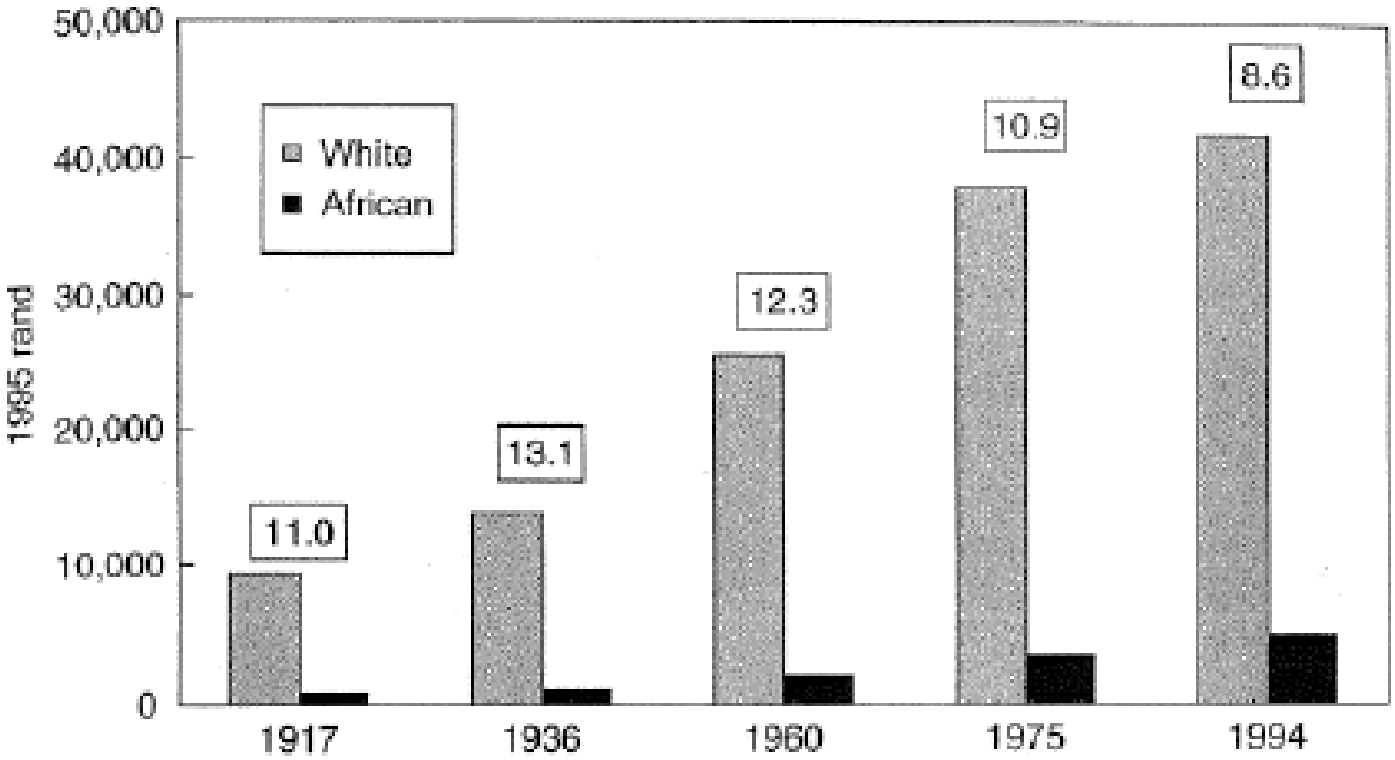


Figure 1.3. Per capita personal income, white and African, selected years, 1917–94

Note: Figure above bars is ratio of white to African per capita personal income.

Sources of Inefficiencies

- Why will some economic economic agents support or opt for inefficient arrangements?

1. *Hold-up*
2. *Political Losers*
3. *Economic Losers*

Towards a Theory of Institutions

- Economic institutions matter for economic growth because they shape incentives.
- Economic institutions not only determine the aggregate economic growth potential of the economy, but also the distribution of resources.
- Summarizing these ideas schematically as (where the subscript t refers to current period and $t+1$ to the future):

$$\text{economic institutions}_t \Longrightarrow \begin{cases} \text{economic performance}_t \\ \text{distribution of resources}_{t+1} \end{cases}.$$

Economic Institutions are Collective Choices

- Economic institutions are determined as collective choices of the society, in large part for their economic consequences.
- However, there is typically be a *conflict of interest* among various groups and individuals over the choice of economic institutions.
- Whose preferences will prevail? The answer depends on the distribution of *political power*. Although the efficiency of one set of economic institutions compared with another may play a role in this choice, political power will be the ultimate arbiter. Whoever has more political power is likely to secure the set of economic institutions that they prefer:

$$\text{political power}_t \Longrightarrow \text{economic institutions}_t$$

Determinants of Political Power

- De jure political power originates from the *political institutions* in society. Political institutions, similarly to economic institutions, determine the constraints on and the incentives of the key actors, but this time in the political sphere.
- Examples of political institutions include the form of government, for example, democracy vs. dictatorship or autocracy, and the extent of constraints on politicians and political elites. Thus

$$\text{political institutions}_t \Longrightarrow \text{ de jure political power}_t$$

- De facto power depends on the ability of the group in question to solve its collective action problem, i.e., to ensure that people act together, even when any individual may have an incentive to free ride. It also depends on a group's on its economic resources:

$$\text{distribution of resources}_t \Longrightarrow \text{de facto political power}_t$$

Political Institutions

- Societies transition from dictatorship to democracy, and change their constitutions to modify the constraints on power holders.
- Since, like economic institutions, political institutions are collective choices, the distribution of political power in society is the key determinant of their evolution.
- Summarizing this discussion, we have:

$$\text{political power}_t \Longrightarrow \text{political institutions}_{t+1}$$

Towards A Dynamic Framework

- Putting this together leads to a "dynamical framework" (attention to "state variables" and "stochastic shocks"):

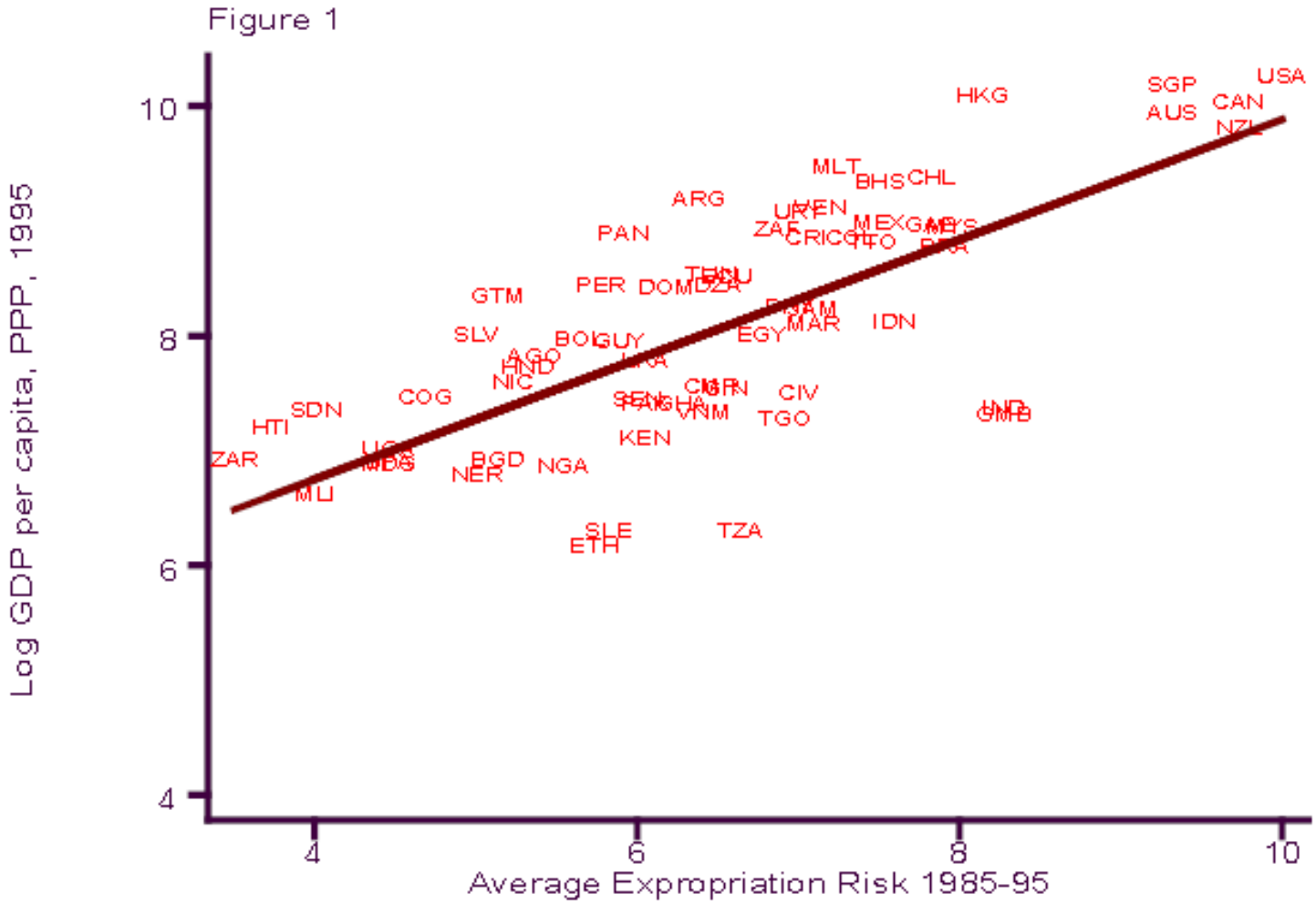
$$\left.\begin{array}{l}\text{political inst's}_t \\ \text{dist. of resources}_t\end{array}\right\} \Longrightarrow \left.\begin{array}{l}\text{de jure political power}_t \\ \& \\ \text{de facto political power}_t\end{array}\right\} \Longrightarrow \left.\begin{array}{l}\text{econ. inst's}_t \\ \text{pol. inst's}_{t+1}\end{array}\right\} \Longrightarrow \left\{\begin{array}{l}\text{econ. perf}_t \\ \& \\ \text{dist. of resources}_{t+1}\end{array}\right.$$

- Many models presented later in the course providing building blocks for a coherent framework of this sort.

Do Policies and Institutions Matter?

- At some level, of course.
- But providing conclusive (even suggestive) evidence is not always easy, and the interpretation is far from straightforward.
- Three important points:
  1. There is strong correlation between various measures of policies, economic institutions and political institutions on the one hand and a battery of economic and social variables on the other.
  2. There is suggestive evidence that a significant part of this correlation is due to the "causal" effect of these institutions and policies.
     - Particularly, new work using within country microdata.
  3. The theoretical interpretation of these results needs to be developed further.
     - Key question: why are certain types of institutions and policies chosen (closely related to the econometric endogeneity of institutions).

Aggregate Correlations



From Correlations to "Causality"

- One attempt, Acemoglu, Johnson and Robinson (2001) (or earlier work by Hall and Jones, 1999, using geography as instrument).
- But we need a "Theory"
- After the discovery of the New World and the rounding of the Cape of Good Hope, Europeans dominated many previously diverse societies, and fundamentally affected their institutions.
- Huge amount of variation in the institutions. Idea: use this variation to test whether or not economic institutions have a causal effect on income per-capita.

Institutional Variation

- "Beginning of Theory": those with political power more likely to opt for good institutions when they will benefit from property rights and investment opportunities.
- Better institutions more likely when there are constraints on elites.
- The colonial context: Europeans more likely to benefit from good institutions when they are a significant fraction of the population, i.e., when they settle
- Lower strata of Europeans place constraints on elites when there are significant settlements.
- Thus: European settlements $\Rightarrow$ better institutions
- But Europeans settlements are endogenous. They may be more likely to settle if a society has greater resources or more potential for growth.
- Or less settlements when greater resources; East India Company and Spanish Crown limited settlements.

Exogenous Source of Variation

- Look for exogenous variation in European settlements: the disease environment
- In some colonies, Europeans faced very high death rates because of diseases for which they had no immunity, in particular malaria and yellow fever.
- Potential mortality of European settlers $\Rightarrow$ settlements $\Rightarrow$ institutions

"Theory"

- Overall summary:

1. There were different types of colonization policies which created different sets of institutions. At one extreme, European powers set up "extractive states". At the other extreme, many Europeans went and settled in a number of colonies, and tried to replicate European institutions, with great emphasis on private property, and checks against government power.
2. The colonization strategy was influenced by the feasibility of settlements. In places where the disease environment was not favorable to European settlement, the formation of the extractive state was more likely.
3. The colonial state and institutions persisted even after independence.

From Correlations to "Causality" (continued)

- Schematically:

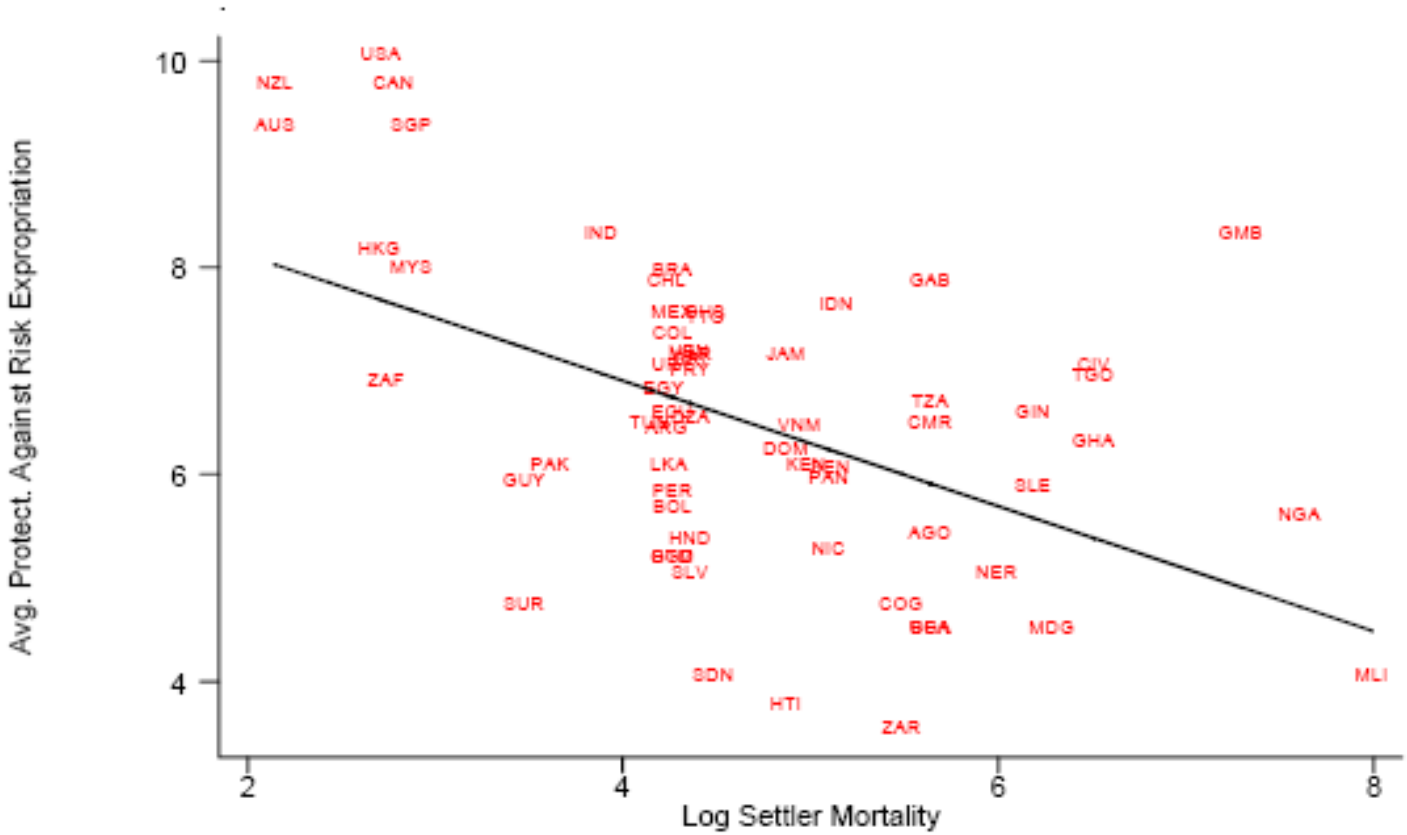
$$\begin{array}{c}\text{(potential) settler} \\ \text{mortality}\end{array} \Rightarrow \text{settlements} \Rightarrow \begin{array}{c}\text{early} \\ \text{institutions}\end{array}$$

$$\Rightarrow \begin{array}{c}\text{current} \\ \text{institutions}\end{array} \Rightarrow \begin{array}{c}\text{current} \\ \text{performance}\end{array}$$

- Try to use this theory to generate a strategy for a two-stage least squares analysis.
- Use "estimates" of potential settler mortality as instrument for institutions in the regression of current GDP (as cumulative measure of growth) on institutions.
- Important: here institutions have to be "very broadly construed".

First Stage

Settler mortality and current institutions



First Stage (continued)

First Stage Regressions:

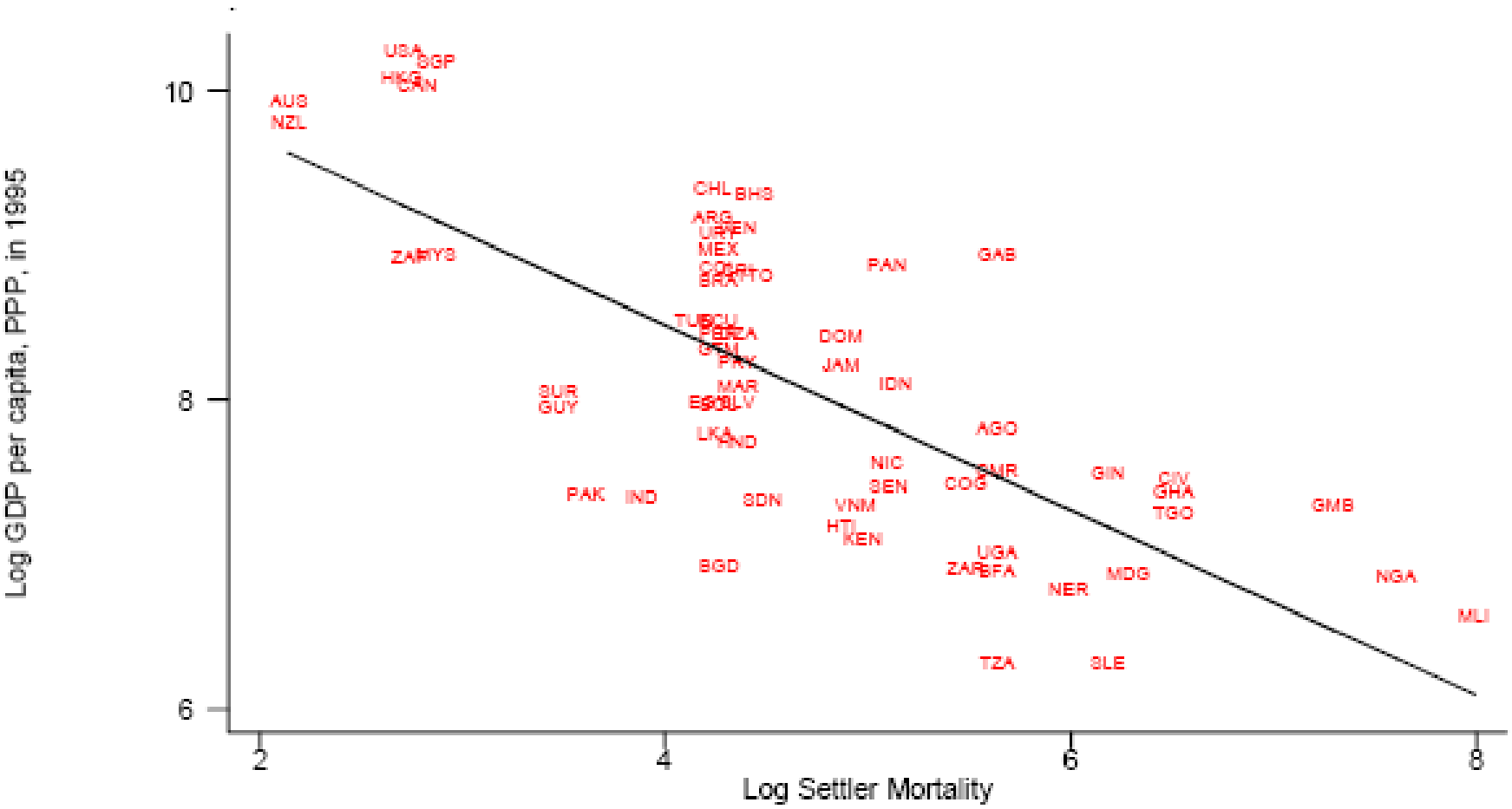
Dependent variable is protection against risk of expropriation

	All former colonies	All former colonies	All former colonies	Without neo-Europes
Settler Mortality	-0.61	-0.5	-0.43	-0.37
	(0.13)	(0.15)	(0.19)	(0.14)
Latitude		2.34		
		(1.37)		
Continent Dummies (p-value)			[0.25]	
R-Squared	0.26	0.29	0.31	0.11
Number of Observations	63	63	63	59

Standard errors in parentheses

Sample limited to countries for which have GDP per capita data

Reduced Form



Results: Summary

Second Stage Regressions:

Dependent variable is log GDP per capita in 1995

	All former colonies	All former colonies	All former colonies	Without neo-Europes
Protection Against Risk of Expropriation, 1985-95	0.99 (0.17)	1.11 (0.26)	1.19 (0.39)	1.43 (0.45)
Latitude		-1.61 (1.57)		
Continent Dummies (p-value)			[0.09]	
Number of Observations	63	63	63	59

Results: Effect of Colonizer

Table 5
IV Regressions of log GDP per capita with Additional Controls

	Base Sample (1)	Base Sample (2)	British colonies only (3)	British colonies only (4)	Base Sample (5)	Base Sample (6)	Base Sample (7)	Base Sample (8)	Base Sample (9)
				Panel A: Two Stage Least Squares					
Average Protection Against Expropriation Risk, 1985-1995	1.10 (0.22)	1.16 (0.34)	1.07 (0.24)	1.00 (0.22)	1.10 (0.19)	1.20 (0.29)	0.92 (0.15)	1.00 (0.25)	1.10 (0.29)
Latitude		-0.75 (1.70)				-1.10 (1.56)		-0.94 (1.50)	-1.70 (1.6)
British Colonial Dummy	-0.78 (0.35)	-0.80 (0.39)							
French Colonial Dummy	-0.12 (0.35)	-0.06 (0.42)							0.02 (0.69)
French legal origin dummy					0.89 (0.32)	0.96 (0.39)			0.51 (0.69)
p-value for Religion Variables							[0.001]	[0.004]	[0.42]
				Panel B: First-Stage for Average Protection against Expropriation Risk in 1985-95					
Log European Settler Mortality	-0.53 (0.14)	-0.43 (0.16)	-0.59 (0.19)	-0.51 (0.14)	-0.54 (0.13)	-0.44 (0.14)	-0.58 (0.13)	-0.44 (0.15)	-0.48 (0.18)
Latitude		1.97 (1.40)				2.10 (1.30)		2.50 (1.50)	2.30 (1.60)
British Colonial Dummy	0.63 (0.37)	0.55 (0.37)							
French Colonial Dummy	0.05 (0.43)	-0.12 (0.44)							-0.25 (0.89)
French legal origin					-0.67 (0.33)	-0.7 (0.32)			-0.05 (0.91)
R-Squared	0.31	0.33	0.30	0.30	0.32	0.35	0.32	0.35	0.45
				Panel C: Ordinary Least Squares					
Average Protection Against Expropriation Risk, 1985-1995	0.53 (0.19)	0.47 (0.07)	0.61 (0.09)	0.47 (0.06)	0.56 (0.06)	0.56 (0.06)	0.53 (0.06)	0.47 (0.06)	0.47 (0.06)

Results: Threats to Validity

Second Stage Regressions: all former colonies

Dependent variable is log GDP per capita in 1995

Instrument is:

	Log Settler Mortality	Log Settler Mortality	Log Settler Mortality	Log Settler Mortality	Yellow Fever
Protection Against Risk of Expropriation, 1985-95	1.07 (0.27)	0.98 (0.17)	0.87 (0.32)	1.18 (0.84)	0.82 (0.22)
Temperature (p-value)	[0.71]				
Humidity (p-value)		[0.64]			
Malaria			-0.28 (0.59)		
Life Expectancy				-0.014 (0.07)	
Number of Observations	63	63	62	62	63

Within-Country Variation

- Much more promising, provided that within country variation (the local institutions) can be identified.
- Examples:
  - Banerjee and Iyer (2005)
  - Iyer (2004)
  - Besley (1995)
  - Field (2003, 2005)
  - Goldstein and Udry (2005)
  - Dell (2009).

The Effects of Forced Labor

- As we have already seen, in places with dense indigenous populations the Spanish set up labor market institutions to extract rents from them.
- The most famous and largest of these was the *Potosí mita* (mita is a Quechua word which means a 'turn') for the silver mines in Bolivia. But others as well, such as the to the mercury mines in Huancavelica in Peru.
- Melissa Dell examines the long-run effects of the mita on current socio-economic outcomes in Peru.
- Her idea is to look at villages close to the boundary of the mita comparing places just inside to just outside. But these places have to be comparable, so she examines places in Peru where observable characteristics are similar (even going back to the 16th century).

The Effects of Forced Labor (continued)

- Melissa finds that consumption levels inside the mita areas are about 30% below those outside the mita.
- The proximate explanation for this is that although both areas grow the same crops, in non-mita areas people sell produce on the market, in mita areas people are subsistence farmers.
- One reason for this is that there is far less infrastructure in mita areas, fewer roads in worse condition.
- The reason for this seems to be that during the colonial period Haciendas (large landholdings) formed outside the mita areas because the Spanish state did not want them taking labor from the mines. But the owners of these Haciendas were powerful Spanish settlers who were able to lobby for public goods, infrastructure etc. This pattern of relative political power seems to have been very persistent.

The Effects of Forced Labor (continued)

	Dependent variable is log equivalent household consumption in 2001			
Sample falls within:	<100 km of *mita* boundary (1)	<75 km of *mita* boundary (2)	<50 km of *mita* boundary (3)	<25 km of *mita* boundary (4)
A: Distance to Potosí				
Mita	-0.278**	-0.303**	-0.336***	-0.375***
	(0.120)	(0.121)	(0.116)	(0.110)
Elevation	-0.336***	-0.268	-0.233	-0.654
	(0.117)	(0.175)	(0.163)	(0.394)
Slope	-0.018	-0.010	-0.002	-0.043
	(0.017)	(0.015)	(0.018)	(0.036)
R^2	0.05	0.04	0.04	0.08
Clusters	72	60	53	31
Observations	1504	1161	1021	635
B: Distance to *mita* boundary				
Mita	-0.247**	-0.249**	-0.235**	-0.298***
	(0.101)	(0.101)	(0.103)	(0.084)
Elevation	-0.212*	-0.264*	-0.305	-0.546*
	(0.123)	(0.154)	(0.185)	(0.283)
Slope	-0.012	-0.016	-0.018	-0.016
	(0.012)	(0.014)	(0.017)	(0.034)
R^2	0.05	0.05	0.04	0.09
Clusters	72	60	53	31
Observations	1504	1161	1021	635

Interpreting the Evidence

- Correlation between institutional variations in economic outcomes unlikely to be due to differences in "efficient" institutions across countries.
  - Provided that some of the attempts to obtain "causal" estimates are valid.
- But then what? Social conflict view: much (most?) of the differences in institutions are endogenous.
- But historical accidents as potential sources of variation.
- Big challenge: to understand the effect of institutions and variation in *endogenous* institutions.
  - The rest of the course: tools to do this and a first attempt.

Introduction

- Let us start the theoretical analysis with the simplest setup in which political power is in the hands of a well-defined elite, this power is not challenged or is challenged only in the simplest possible way, and the focus is on how the elite uses its power to "efficiently" or "inefficiently" enrich itself (or adopt policies for its own interests).
- We will follow this up with a more systematic analysis of institutional change

Simple Model of Elite Control

- Consider an infinite horizon economy populated by a continuum $1 + \theta_e + \theta_m$ of risk neutral agents, each with a discount factor equal to $\beta < 1$.
- Unique non-storable final good denoted by y.
- The expected utility of agent j at time 0 is given by:

$$U_0^j = \mathbb{E}_0 \sum_{t=0}^{\infty} \beta^t c_t^j, \tag{1}$$

where $c_t^j \in \mathbb{R}$ denotes the consumption of agent j at time t and $\mathbb{E}_t$ is the expectations operator conditional on information available at time t.

Environment

- Agents are in three groups.
  1. workers, mass 1, supplying labor inelastically.
  2. elite (denoted by e), total mass θ^e (set S^e); initially hold political power in this society and engage in entrepreneurial activities
  3. middle class (denoted by m), total mass θ^m (set S^m); engage in entrepreneurial activities
- Each member of the elite and middle class has access to production opportunities, represented by the production function

$$y_t^j = \frac{1}{1-\alpha}(A_t^j)^{\alpha}(k_t^j)^{1-\alpha}(l_t^j)^{\alpha}, \tag{2}$$

  where k denotes capital and l labor.
- Capital is assumed to depreciate fully after use.
- Productivity of each elite agent is A^e in each period, and that of each middle class agent is A^m.
- In addition, natural resource rents R at each date.

Policies

- Taxes: activity-specific tax rates on production, $\tau^e \geq 0$ and $\tau^m \geq 0$.
- No other fiscal instruments to raise revenue. (in particular, no lump-sum non-distortionary taxes).
- The proceeds of taxes and revenues from natural resources can be redistributed as nonnegative lump-sum transfers targeted towards each group, $T^w \geq 0$, $T^m \geq 0$ and $T^e \geq 0$.
- $\phi \in [0,1]$ reduced form measure of "state capacity,"
- Government budget constraint:

$$T_t^w + \theta^m T_t^m + \theta^e T_t^e \leq \phi \int_{j \in S^e \cup S^m} \tau_t^j y_t^j dj + R. \tag{3}$$

Employment

- Maximum scale for each firm, so that
$$l_t^j \leq \lambda \text{ for all } j \text{ and } t.$$
- This prevents the most productive agents in the economy from employing the entire labor force.
- Market clearing:
$$\int_{j \in S^e \cup S^m} l_t^j dj \leq 1. \tag{4}$$
- Since $l_t^j \leq \lambda$, (4) implies that if
$$\theta^e + \theta^m \leq \frac{1}{\lambda}, \tag{ES}$$
there can never be full employment.
- Depending on whether Condition (ES) holds, there will be excess demand or excess supply of labor in this economy. Also assume
$$\theta^e \leq \frac{1}{\lambda} \text{ and } \theta^m \leq \frac{1}{\lambda}.$$

Economic Equilibrium

- An *economic equilibrium* is defined as a sequence of wages $\{w_t\}_{t=0,1,...,\infty}$, and investment and employment levels for all producers, $\left\{\left[k_t^j, l_t^j\right]_{j\in S^e\cup S^m}\right\}_{t=0,1,...,\infty}$ such that given $\{\tau_t^e, \tau_t^m\}_{t=0,1,...,\infty}$ and $\{w_t\}_{t=0,1,...,\infty}$, all producers choose their investment and employment optimally and the labor market clears.
- Each producer takes wages, w_t, as given, and maximizes

$$\max_{k_t^j, l_t^j} \frac{1-\tau_t^j}{1-\alpha}(A^j)^{\alpha}(k_t^j)^{1-\alpha}\left(l_t^j\right)^{\alpha} - w_t l_t^j - k_t^j.$$

- Solution:

$$k_t^j = (1-\tau_t^j)^{1/\alpha} A^j l_t^j, \text{ and} \tag{5}$$

$$l_t^j \begin{cases} = 0 & \text{if } w_t > \frac{\alpha}{1-\alpha}(1-\tau_t^j)^{1/\alpha}A^j \\ \in [0,\lambda] & \text{if } w_t = \frac{\alpha}{1-\alpha}(1-\tau_t^j)^{1/\alpha}A^j \\ = \lambda & \text{if } w_t < \frac{\alpha}{1-\alpha}(1-\tau_t^j)^{1/\alpha}A^j \end{cases}. \tag{6}$$

Comments

- $\alpha(1-\tau_t^j)^{1/\alpha}A^j/(1-\alpha)$ is the net marginal product of a worker employed by a producer of group j.
- If the wage is above this amount, this producer would not employ any workers, and if it is below, he or she would prefer to hire as many workers as possible (i.e., up to the maximum, λ).
- Potential distortion: producers invest in physical capital but only receive a fraction $(1-\tau_t^j)$ of the revenues.
- Therefore, taxes discourage investments, creating potential "inefficiencies"
- But are these Pareto inefficiencies?

Equilibrium Wages

- Combining (6) with (4), equilibrium wages are obtained as follows:
  - (i) If Condition (ES) holds, there is excess supply of labor and $w_t = 0$.
  - (ii) If Condition (ES) does not hold, then there is "excess demand" for labor and the equilibrium wage is

$$w_t = \min \left\langle \frac{\alpha}{1-\alpha}(1-\tau_t^e)^{1/\alpha} A^e, \frac{\alpha}{1-\alpha}(1-\tau_t^m)^{1/\alpha} A^m \right\rangle. \tag{7}$$

- Note that when Condition (ES) does not hold, the equilibrium wage is equal to the net productivity of one of the two groups of producers, so either the elite or the middle class will make zero profits in equilibrium.

Summary of Economic Equilibrium

- Finally, equilibrium level of aggregate output is

$$\begin{aligned} Y_t &= \frac{1}{1-\alpha}\left(1-\tau_t^e\right)^{(1-\alpha)/\alpha} A^e \int_{j\in S^e} l_t^j dj \\ &\quad + \frac{1}{1-\alpha}\left(1-\tau_t^m\right)^{(1-\alpha)/\alpha} A^m \int_{j\in S^m} l_t^j dj + R. \end{aligned} \tag{8}$$

Proposition: For a given sequence of taxes $\left\{\tau_t^e, \tau_t^m\right\}_{t=0,1,\ldots,\infty}$, the equilibrium takes the following form: if Condition (ES) holds, then $w_t = 0$, and if Condition (ES) does not hold, then w_t is given by (7). Given the wage sequence, factor demands are given by (5) and (6), and aggregate output is given by (8).

"Inefficient" Policies

- Let us now look at sources of inefficient policies under the dictatorship of the elite.
- Key distortionary policy, tax on the middle class
- Three reasons to use this tax:
  1. Revenue Extraction;
  2. Factor Price Manipulation;
  3. Political Consolidation.

Simplifying Assumptions

- Upper bound on taxation, so that

$$\tau_t^m \leq \bar{\tau} \text{ and } \tau_t^e \leq \bar{\tau},$$

  where $\bar{\tau} \leq 1$.
- *The timing of events within each period*
  1. taxes are set;
  2. investments are made.
- This removes an additional source of inefficiency related to the *holdup problem*.
- To start with, equilibrium concept: Markov Perfect Equilibria (MPE)—the elite set the tax rate today without commitment to future tax rates (but in the baseline model we start with this is equivalent to choosing the entire future sequences of tax rates).

Revenue Extraction

- To highlight this mechanism, suppose that Condition (ES) holds, so wages are constant at zero. T
- his removes any effect of taxation on factor prices.
- In this case, from (6), we also have $I_t^j = \lambda$ for all producers.
- Also assume that $\phi > 0$ (for example, $\phi = 1$).
- Tax revenues to be distributed back to the elite

$$\text{Revenue}_t = \frac{\phi}{1-\alpha}\tau_t^m(1-\tau_t^m)^{(1-\alpha)/\alpha}A^m\lambda\theta^m + R. \tag{9}$$

- Clearly this is maximized at

$$\tau_t^m = \tau^{RE} \equiv \min\left\{\alpha, \bar{\tau}\right\}. \tag{10}$$

Revenue Extraction (continued)

- No intertemporal linkages

Proposition: Suppose Condition (ES) holds and $\phi > 0$, then the unique MPE features $\tau_t^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$ for all t.

- Taxing at the top of the Laffer curve
- Is this equilibrium inefficient? Pareto inefficient? Surplus inefficient?
- High taxes distortionary, but fiscal policies are not used to harm the middle class.

Factor Price Manipulation

- To highlight this mechanism in the simplest possible way, let us first assume that $\phi = 0$ so that there are no direct benefits from taxation for the elite.
- There are indirect benefits, because of the effect of taxes on factor prices, which will be present as long as the equilibrium wage is positive.
- Suppose that Condition (ES) does not hold, so that equilibrium wage is given by (7).
- Therefore, choose taxes to minimize equilibrium wages.

Factor Price Manipulation (continued)

Proposition: Suppose Condition (ES) does not hold, and $\phi = 0$, then the unique MPE features $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$ for all t.

- Higher taxes in order to harm the middle class
- Because of competition in the labor market.
- *Implication:* factor price manipulation much more damaging to output.
- Naturally, $\phi = 0$ important
- What about inefficiency in this case?

Combined Effects

- Now let us combine the two effects.
- Main results: the factor price manipulation effect will push the economy *beyond the peak* of the Laffer curve
- The elite's problem can be written as

$$\max_{\tau_t^m} \left[\frac{\alpha}{1-\alpha} A^e - w_t \right] I_t^e + \frac{1}{\theta^e} \left[\frac{\phi}{1-\alpha} \tau_t^m (1-\tau_t^m)^{(1-\alpha)/\alpha} A^m I_t^m \theta^m + R \right], \tag{11}$$

subject to (7) and

$$\theta^e I_t^e + \theta^m I_t^m = 1, \text{ and} \tag{12}$$

$$I_t^m = \lambda \text{ if } \quad (1-\tau_t^m)^{1/\alpha} A^m \geq A^e. \tag{13}$$

- Assume

$$A^e \geq \phi (1-\alpha)^{(1-\alpha)/\alpha} A^m \frac{\theta^m}{\theta^e}$$

so that the elite do not wish to stop producing altogether.

Combined Effects (continued)

- Then the equilibrium will be $w_t = \alpha(1-\tau_t^m)^{1/\alpha} A^m \tau_t^m / (1-\alpha)$, and the elite's problem simply boils down to choosing τ_t^m to maximize

$$\frac{1}{\theta^e}\left[\frac{\phi}{1-\alpha}\tau_t^m(1-\tau_t^m)^{(1-\alpha)/\alpha}A^m l^m \theta^m + R\right] - \frac{\alpha}{1-\alpha}(1-\tau_t^m)^{1/\alpha}A^m\lambda, \tag{14}$$

  where we have used the fact that all elite producers will employ λ employees, and from (12), $l_m = (1-\lambda\theta^e)/\theta^m$.
- The maximization of (14) gives

$$\frac{\tau_t^m}{1-\tau_t^m} = \kappa(\lambda, \theta^e, \alpha, \phi) \equiv \frac{\alpha}{1-\alpha}\left(1 + \frac{\lambda\theta^e}{(1-\lambda\theta^e)\phi}\right).$$

- τ_t^m is always less than 1, which is the desired tax rate in the case of pure factor price manipulation.
- But $\kappa(\lambda, \theta^e, \alpha, \phi)$ is also strictly greater than $\alpha/(1-\alpha)$, so that τ_t^m is always greater than α, the desired tax rate with pure revenue extraction.

Combined Effects (continued)

- In summary, combined effects lead to desired tax rate:

$$\tau_t^m = \tau^{COM} \equiv \min\left\{\frac{\kappa\left(\lambda, \theta^e, \alpha, \phi\right)}{1+\kappa\left(\lambda, \theta^e, \alpha, \phi\right)}, \bar{\tau}\right\}. \tag{15}$$

- *Comparative Statics:*
  1. ϕ reduces τ^{COM} because increased state capacity makes revenue extraction more important.declines.
  2. θ^e increases τ^{COM} because revenue extraction becomes less important and factor price manipulation becomes more important.
  3. α increases taxes.

Proposition: Suppose Condition (ES) does not hold, and $\phi > 0$. Then the unique MPE features $\tau_t^m = \tau^{COM}$ as given by (15) for all t. Equilibrium taxes are increasing in θ^e and α and decreasing in ϕ.

Political Consolidation

- Same results if competition for political power other than in the labor market.
- Imagine that if the middle class become richer, then they are more likely to gain political power.
- Then:

Proposition: Consider the economy with political replacement. Suppose Condition (ES) holds and $\phi > 0$, then the unique MPE features $\tau_t^m = \tau^{PC} > \tau^{RE}$ for all t. This tax rate is increasing in R and ϕ.

- New result: tax rate is increasing in R and ϕ.
- This is because political stakes are higher.
- The "dark side" of state capacity.

Subgame Versus Markov Perfect Equilibria

- What happens if you look at subgame perfect equilibria?

Proposition: The MPEs characterized above are the unique SPEs.

- Why? Because unique best responses within each period, and no intertemporal linkages.
- More interestingly, this is because there is no "political failure".
- All of the equilibria above (with the exception of political consolidation effect depending on details) are *Pareto optimal*.

Holdup

- Political failures are introduced if investments are "long term" so that tax decisions are made partly after investments are sunk.
- Change the timing of events such that:
  1. individual producers undertake their investments;
  2. the elite set taxes.
- The elite will no longer take the discourage of taxes on investment into account in the MPE.
- Therefore

Proposition: With holdup, there is a unique MPE with $\tau_t^m = \tau^{HP} \equiv \bar{\tau}$ for all t.

- Now greater distortions and potential Pareto inefficiencies.

Subgame Perfect Equilibria

- Now imagine trigger-strategy equilibria.
- Suppose that Condition (ES) holds and $\phi > 0$, so that most preferred tax rate for the elite is $\tau^m = \alpha$.
- Suppose also that $\bar{\tau} = 1$.
- Consider the strategy profile where the elite set $\tau^m = \alpha$ at each date and the middle class choose investment levels according to this tax rate.
- If the elite ever set a higher tax rate, then the middle class expect $\tau^m = 1$ in all future dates, and choose zero production.

Subgame Perfect Equilibria (continued)

- With this strategy profile, the elite will raise

$$\frac{\phi}{(1-\beta)(1-\alpha)}\alpha(1-\alpha)^{(1-\alpha)/\alpha}A^m\lambda\theta^m \tag{16}$$

if they set α at the state.

- If, in contrast, they deviate at any point, the most profitable deviation for them is to set $\tau^m = 1$, and they will raise

$$\frac{\phi}{1-\alpha}(1-\alpha)^{(1-\alpha)/\alpha}A^m\lambda\theta^m. \tag{17}$$

- The trigger-strategy profile will be an equilibrium as long as (16) is greater than or equal to (17), which requires $\beta \geq 1-\alpha$. Therefore:

Proposition: Consider the holdup game, and suppose that Conditions (ES) hold and $\bar{\tau} = 1$. Then for $\beta \geq 1-\alpha$, there exists a subgame perfect equilibrium where $\tau_t^m = \alpha$ for all t.

Technology Adoption and Holdup

- Suppose now that taxes are set before investments, so the source of holdup above is absent.
- Instead, suppose that at time $t = 0$ before any economic decisions or policy choices are made, middle class agents can invest to increase their productivity.
- There is a cost $\Gamma\left(A^m\right)$ of investing in productivity A^m.
- Once investments in technology are made, the game proceeds as before.
- Since investments in technology are sunk after date $t = 0$, the equilibrium allocations are the same as in the results presented above.
- *Question:* if they could, the elite would prefer to commit to a tax rate sequence at time $t = 0$.

Technology Adoption: Factor Price Manipulation

Proposition: Consider the game with technology adoption and suppose that Condition (ES) does not hold, and $\phi = 0$, then the unique MPE and unique SPE feature $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$ for all t. Moreover, if the elite could commit to a tax sequence at time $t = 0$, then they would still choose $\tau_t^m = \tau^{FPM} \equiv \bar{\tau}$.

- Intuition: this is the case of pure factor price manipulation, so the only objective of the elite is to reduce the middle class' labor demand.
- Therefore, they have no interest in increasing the productivity of middle class producers.

Technology Adoption: Revenue Extraction

- Let us next consider the pure revenue extraction case with Condition (ES) satisfied.
- Once again, the MPE is identical to before with $\tau^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$.
- As a result, the first-order condition for an interior solution to the middle class producers' technology choice is:

$$\Gamma'(A^m) = \frac{1}{1-\beta}\frac{\alpha}{1-\alpha}(1-\tau^m)^{1/\alpha}. \tag{18}$$

- This is also the unique SPE, since no punishments are possible.
- But, if the elite could commit to a tax rate sequence at time $t = 0$, they would choose lower taxes in order to increase investment by the middle class and thus tax revenues.

Technology Adoption: Revenue Extraction (continued)

- To illustrate this, suppose that the elite can commit to a constant tax rate.
- Then, the optimization problem of the elite is to maximize tax revenues taking the relationship between taxes and technology as in (18) as given. In other words, they will solve:

$$\max \phi \tau^m \left(1-\tau^m\right)^{(1-\alpha)/\alpha} A^m \lambda \theta^m / \left(1-\alpha\right)$$

subject to (18).

- The first-order condition for an interior solution can be expressed as

$$A^m - \frac{1-\alpha}{\alpha}\frac{\tau^m}{1-\tau^m}A^m + \tau^m \frac{dA^m}{d\tau^m} = 0$$

where

$$\frac{dA^m}{d\tau^m} = -\frac{1}{1-\beta}\frac{1}{1-\alpha}\frac{\left(1-\tau^m\right)^{(1-\alpha)/\alpha}}{\Gamma''\left(A^m\right)} < 0$$

takes into account the effect of future taxes on technology choice at time $t = 0$.

Technology Adoption: Revenue Extraction (continued)

Proposition: Consider the game with technology adoption, and suppose that Condition (ES) holds and $\phi > 0$, then the unique political equilibrium features $\tau_t^m = \tau^{RE} \equiv \min\{\alpha, \bar{\tau}\}$ for all t. If the elite could commit to a tax policy at time $t = 0$, they would prefer to commit to $\tau^{TA} < \tau^{RE}$.

- Therefore, in contrast to the pure holdup problem where SPE could prevent the additional inefficiency (when $\beta \geq 1 - \alpha$), with the technology adoption game, the inefficiency survives the SPE.
- The reason is that, since middle class producers invest only once at the beginning, there is no possibility of using history-dependent punishment strategies.
- This illustrates the limits of implicit agreements to keep tax rates low.
- Such agreements not only require a high discount factor ($\beta \geq 1 - \alpha$), but also frequent investments by the middle class, so that there is a credible threat against the elite if they deviate from the promised policies.

Conclusion

- Distributional conflicts will lead to distortionary policies.
- The extent of distortions depends on whether groups in power wish to manipulate factor prices.
- Factor price manipulation could lead to higher taxes, insecure property rights, and barriers against technology adoption
- These equilibria not necessarily Pareto suboptimal—the set of instruments is restricted.
- However, Pareto inefficiencies arise when there are nontrivial dynamic interactions (as in holdup or technology adoption)
- Also note that simply changing the identity of the group in power may not improve the allocation of resources as we discuss in greater detail next.