

# Do Institutions Cause Growth?

## Colonial Origin of Comparative Development

### Lecture No. 10

## Roadmap

### 1. “The Colonial Origins of Comparative Development: An Empirical Investigation”

Acemoglu, Johnson, Robinson (AER 2001)

- Discussion by Glaeser, La Porta, Lopez-de-Silanes, Shleifer in JEG 2004
- Reply of AJR

### 2. “Reversal of Fortune”

Acemoglu, Johnson, Robinson (QJE 2002)

### 3. “Unbundling Institutions”

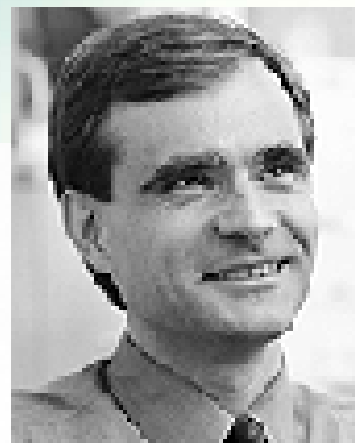
Acemoglu and Johnson (JPE 2005)



**Daron Acemoglu**  
(MIT)



**James Robinson**  
(Harvard University)



**Simon Johnson**  
(MIT)

# Colonial Origin of Comparative Development

AJR (AER 2001)

# Why even ask this question?

- At some level, it is obvious that institutions matter
  - Divergent paths of North and South Korea, or East and West Germany
    - one part of the country stagnated under central planning and collective ownership, while the other prospered with private property and a market economy
- Nevertheless, we lack reliable estimates of the effect of institutions on economic performance
  - Mauro (1995), Hall and Jones (1999), Knack and Keefer (1995)
  - Attempts to instrument for institutions with
    - ELF (direct effect)
    - European influence (endogenous)

# Economic institutions and economic performance

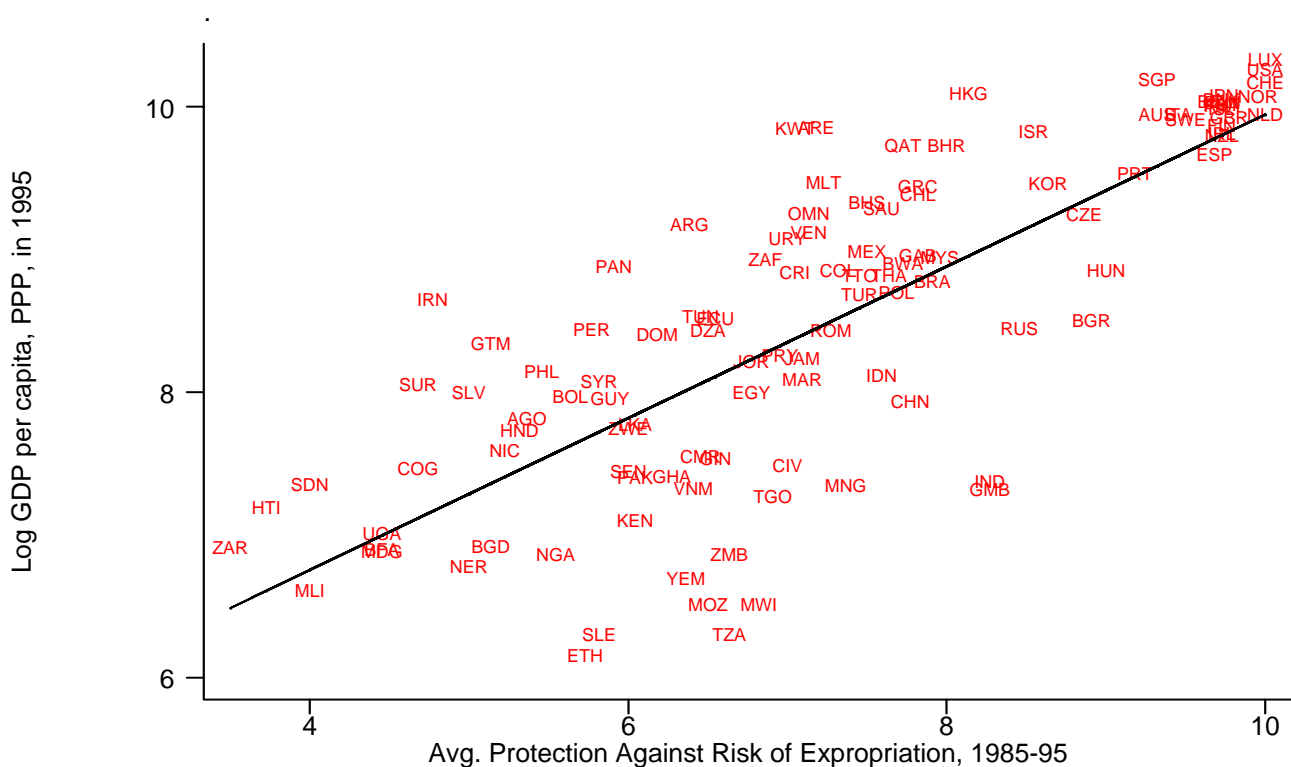


TABLE 2—OLS REGRESSIONS

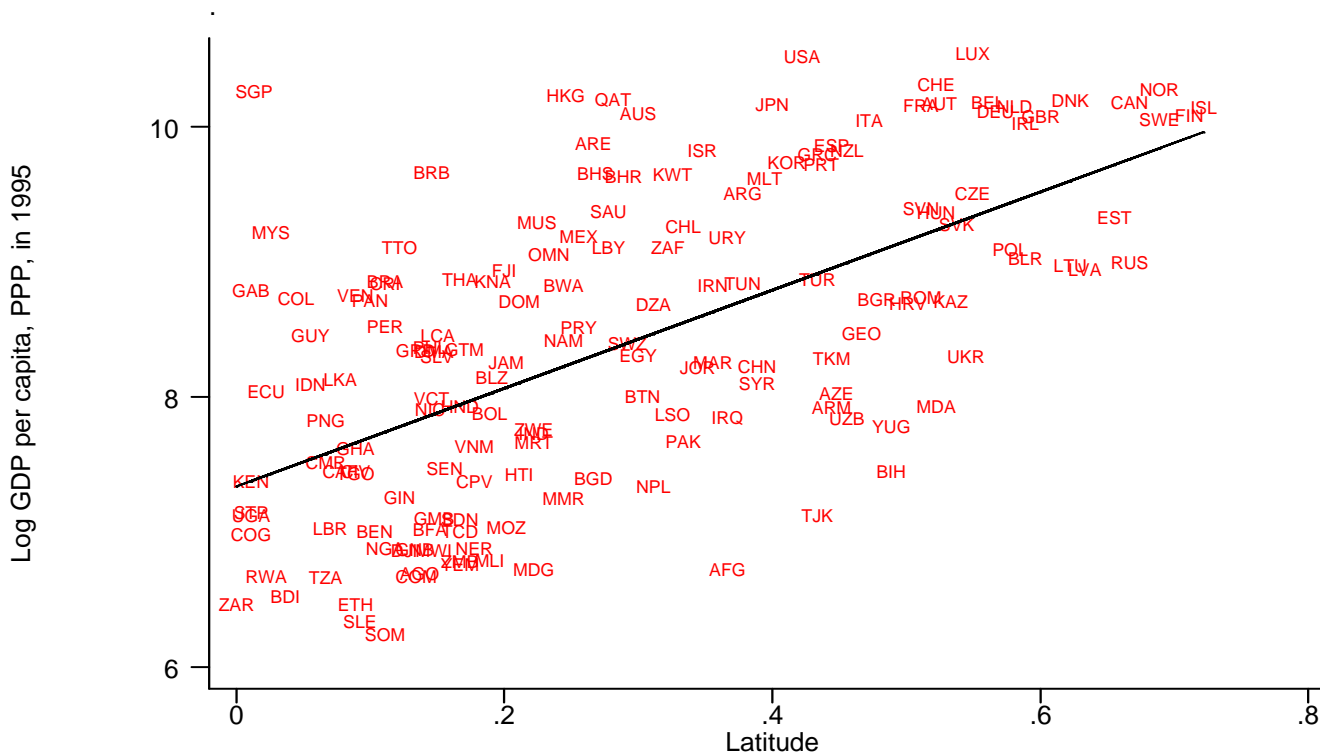
	Whole world (1)	Base sample (2)	Whole world (3)	Whole world (4)	Base sample (5)	Base sample (6)	Whole world (7)	Base sample (8)
	Dependent variable is log GDP per capita in 1995						Dependent variable is log output per worker in 1988	
Average protection against expropriation risk, 1985–1995	0.54 (0.04)	0.52 (0.06)	0.47 (0.06)	0.43 (0.05)	0.47 (0.06)	0.41 (0.06)	0.45 (0.04)	0.46 (0.06)
Latitude			0.89 (0.49)	0.37 (0.51)	1.60 (0.70)	0.92 (0.63)		
Asia dummy				-0.62 (0.19)		-0.60 (0.23)		
Africa dummy				-1.00 (0.15)		-0.90 (0.17)		
“Other” continent dummy				-0.25 (0.20)		-0.04 (0.32)		
$R^2$	0.62	0.54	0.63	0.73	0.56	0.69	0.55	0.49
Number of observations	110	64	110	110	64	64	108	61

*Notes:* Dependent variable: columns (1)–(6), log GDP per capita (PPP basis) in 1995, current prices (from the World Bank’s World Development Indicators 1999); columns (7)–(8), log output per worker in 1988 from Hall and Jones (1999). Average protection against expropriation risk is measured on a scale from 0 to 10, where a higher score means more protection against expropriation, averaged over 1985 to 1995, from Political Risk Services. Standard errors are in parentheses. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable definitions and sources. Of the countries in our base sample, Hall and Jones do not report output per worker in the Bahamas, Ethiopia, and Vietnam.

## Institutions are endogenous

- Institutions could vary because underlying factors differ across countries
  - Geography, ecology, climate
  - Culture
  - Other factors
- Charles Montesquieu (1748):
  - Geography and climate determine “human attitudes”
  - Human attitudes determine both economic performance and political system
- Jeffrey Sachs (2001)
  - Importance of technology, disease environment and transport costs (determined by geography and climate)
- Identification problem
  - We can learn only a limited amount from correlations and OLS regressions

# Geography



## Empirical pitfalls

- Montesquieu's story example of **omitted variables bias** and identification problem
  - Economies that are different for a variety of reasons will differ both in their institutions and in their income per capita
  - Omitted factors: human nature, culture, geography
  - Similar problem affects inferences about geography on income
- **Reverse causality:**
  - Income affects institutions: Rich economies choose or can afford better institutions
- **Attenuation bias:**
  - Measures of institutions very coarse, poorly correspond to conceptual measures, creating "errors-in-variables" problem
- Need a source of exogenous variation - an instrument for institutions
  - Affects institutions, but has no direct effect, or effect through other channels, on economic performance

## History + theory → potential instruments

### Theory →

- those with political power are more likely to opt for good institutions when they will benefit from property rights and investment opportunities
- better institutions arise 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 → better institutions

## Endogeneity of settlements

- But European 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

# The colonial experience

- 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
  - They did not settle
  - Did not set up good institutions
  - Moreover, institutions persist...
- **potential mortality of European settlers → settlements → past institutions → current institutions**

## potential mortality of European settlers → settlements

- Curtin (1964): Plans for settlements in West Africa were ruined by very high mortality among early settlers
  - in Bulama (April 1792-April 1793) there was 61% mortality among Europeans in the first year
  - In Sierra Leone Company (1792-1793), 72% of the European settlers died in the first year
  - On Mungo Park's Second Expedition (May-November 1805), 87% of Europeans died during the trip from Gambia to the Niger, and all the Europeans died before completing the expedition
- Crosby (1986): the awareness
  - An example of the awareness of the disease environment - the Pilgrim fathers decided to migrate to the U.S. rather than Guyana because of the high mortality rates in Guyana
  - Beauchamp Committee in 1795 – decision to send convicts to Australia, rather than the Lemane island on Gambia River because the risk of dying was too high even for convicts

## settlements → past institutions

- where Europeans settled in large numbers:
  - life was modeled after the home country
  - settler colonies had representative institutions which promoted freedom and the ability to get rich by engaging in trade
  - property rights and constraints on state power in the settler colonies
- where Europeans did not settle:
  - set up authoritarian and absolutist states with the purpose of maintaining control and facilitating the extraction of resources from colonies
    - the slave trade in Africa; gold extraction in America
  - King Leopold of Belgium in Congo:
    - philosophy was that “the colonies should be exploited, not by the operation of a market economy, but by state intervention and compulsory cultivation of cash crops to be sold to and distributed by the state at controlled prices”
  - few constraints on state power in the non-settler colonies

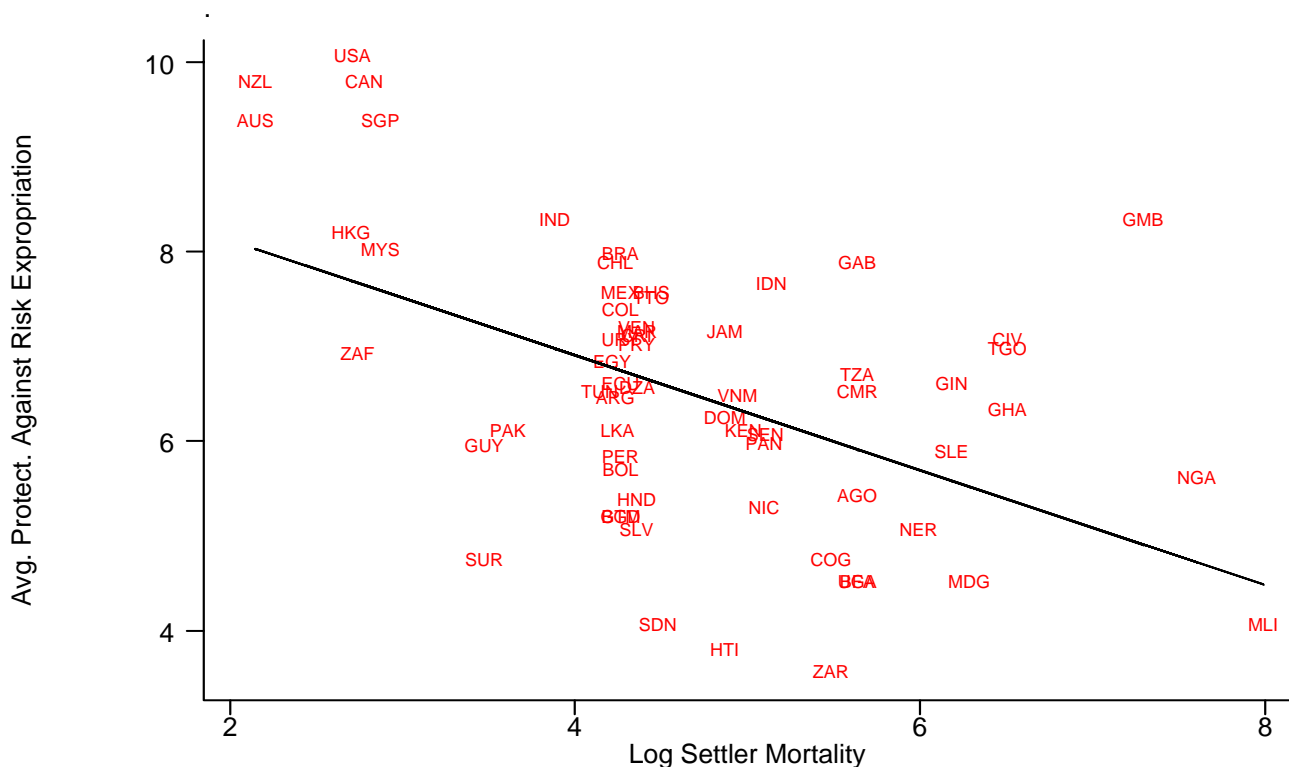
## Institutional Persistence

- Equilibria
  - Good institutions are costly to set up, but when costs are sunk, no reason to change
  - Size of elite (small in extractive non-settler colonies)
  - Complementarity of investment (agents who have invested in human and physical capital will be in favor of spending money to enforce property right)
- Good institutions:
  - law and order and private property established during the early phases of colonialism in Australia, Canada, New Zealand, the U.S., Hong Kong, and Singapore formed the basis of the current day institutions
- Bad institutions:
  - forced labor policies in Latin America persisted and were even intensified or reintroduced with the expansion of export agriculture in the latter part of the 19th century

# Empirical Strategy

- Empirical setup: Two Stage Least-Squares (2SLS)
  - Second stage:  $\log \text{ income per capita} = f(\text{current economic institutions})$
  - First stage:  $\text{current economic institutions} = g(\text{settler mortality})$
- Data on potential European settler mortality
  - Work by the historian Philip Curtin provides us with mortality rates of soldiers stationed in the colonies in the early 19th century
  - Supplemented by data on mortality of Catholic bishops in Latin America
- Current economic institutions proxied by protection against expropriation risk
  - Useful to bear in mind that history generates variation in a cluster of broad institutions;
  - Protection against expropriation risk proxying for many other sources of institutional variation

# Settler mortality and current institutions



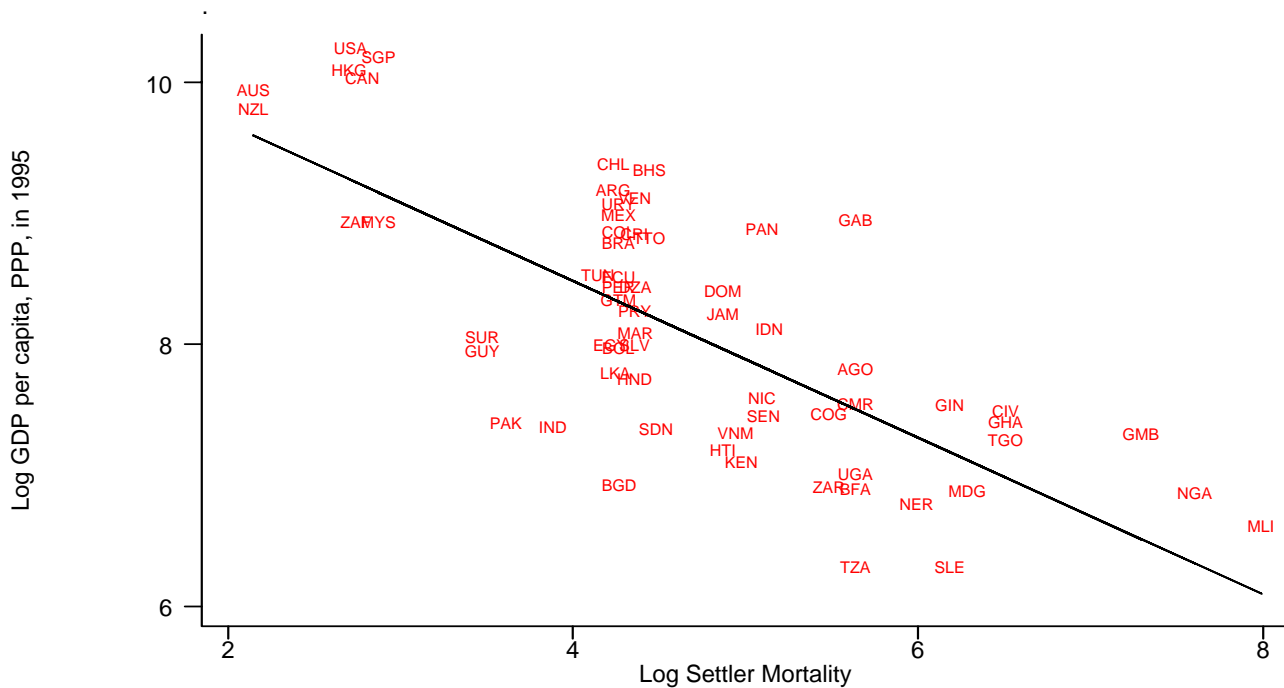
## Is the empirical approach valid?

- No reverse causality, mortality rates refer to two centuries ago
- Is the exclusion restriction of the 2SLS valid?
  - Plausible. Yellow fever, malaria and gastrointestinal diseases affecting Europeans had much less effect on native inhabitants, who had genetic and acquired immunity
    - If kids survive, they get immunity
    - Mortality rates of local troops - very similar in different regions despite very large differences in European mortality rates
      - otherwise, a direct effect on human capital and incomes
- AJR show that climate is not collinear with disease environment

## Is the empirical approach valid? (2)

- Check validity further by controlling for potential sources of direct effect:
  - latitude, measures of geography, current prevalence of malaria and life expectancy
- Use only variation due to yellow fever, which is now mostly eradicated, thus, less likely to have direct effect
- These checks all support the validity of the approach
- Note not estimating the causal effect of being colonized vs. not colonized (!!!)

# The reduced form: settler mortality and income per capita today



# The first stage

	Base Sample (1)	Base Sample (2)	Base Sample without neo-Europes (3)	Base Sample without neo-Europes (4)	Base Sample without Africa (5)	Base Sample without Africa (6)	Base Sample with Continent Dummies (7)	Base Sample with Continent Dummies (8)
Log European Settler Mortality	-0.61 (0.13)	-0.51 (0.14)	-0.39 (0.13)	-0.39 (0.14)	-1.20 (0.22)	-1.10 (0.24)	-0.43 (0.17)	-0.34 (0.18)
Latitude		2.00 (1.34)		-0.11 (1.50)		0.99 (1.43)		2.00 (1.40)
Asia Dummy							0.33 (0.49)	0.47 (0.50)
Africa Dummy							-0.27 (0.41)	-0.26 (0.41)
"Other" Continent Dummy							1.24 (0.84)	1.1 (0.84)
R-Squared	0.27	0.30	0.13	0.13	0.47	0.47	0.30	0.33

# The second stage

	Base Sample (1)	Base Sample (2)	Base Sample without neo-Europes (3)	Base Sample without neo-Europes (4)	Base Sample without Africa (5)	Base Sample without Africa (6)	Base Sample with Continent Dummies (7)	Base Sample with Continent Dummies (8)
<i>Panel A: Two Stage Least Squares</i>								
Average Protection Against Expropriation Risk 1985-1995	0.94 (0.16)	1.00 (0.22)	1.28 (0.36)	1.21 (0.35)	0.58 (0.10)	0.58 (0.12)	0.98 (0.30)	1.10 (0.46)
Latitude		-0.65 (1.34)		0.94 (1.46)		0.04 (0.84)		-1.20 (1.8)
Asia Dummy							-0.92 (0.40)	-1.10 (0.52)
Africa Dummy							-0.46 (0.36)	-0.44 (0.42)
"Other" Continent Dummy							-0.94 (0.85)	-0.99 (1.0)
<i>Panel C: Ordinary Least Squares</i>								
Average Protection Against Expropriation Risk 1985-1995	0.52 (0.06)	0.47 (0.06)	0.49 (0.08)	0.47 (0.07)	0.48 (0.07)	0.47 (0.07)	0.42 (0.06)	0.40 (0.06)
Number of Observations	64	64	60	60	37	37	64	64

Zhuravskaya/Sonin Political Economics Lectures No 10

# Basic results

- Very large causal effects of institutions on long-run growth
  - Differences in institutions account for over  $\frac{3}{4}$  of the variation in income per capita today (long-run effect)
    - The estimate implies the 2.24 differences in expropriation risk between Nigeria and Chile translates into 7 fold difference in income
      - In practice, Chile is over 11 times as rich as Nigeria

# Robustness checks

- Results highly robust:
  - Robust in different subsamples
  - Robust to controlling for:
    - continent dummies
    - latitude, landlocked, temperature, humidity
    - current prevalence of malaria and life expectancy
    - legal origin, colonial origin
    - Direct effect of the presence of Europeans
    - ELF
  - Robust when exploiting only yellow fever
- No evidence of any effect of geography or religion on long run growth

# The role of geography

- No causal effect of geography
- How do we think of the correlation between geography (e.g., latitude) and income?
- This is caused by omitted factors;
  - Geography correlated with institutions because of the natural experiment of European colonialism
  - Tropical areas ended up with worse institutions, because
    - they tended to be richer and more densely-populated around 1500
    - they attracted fewer European settlers

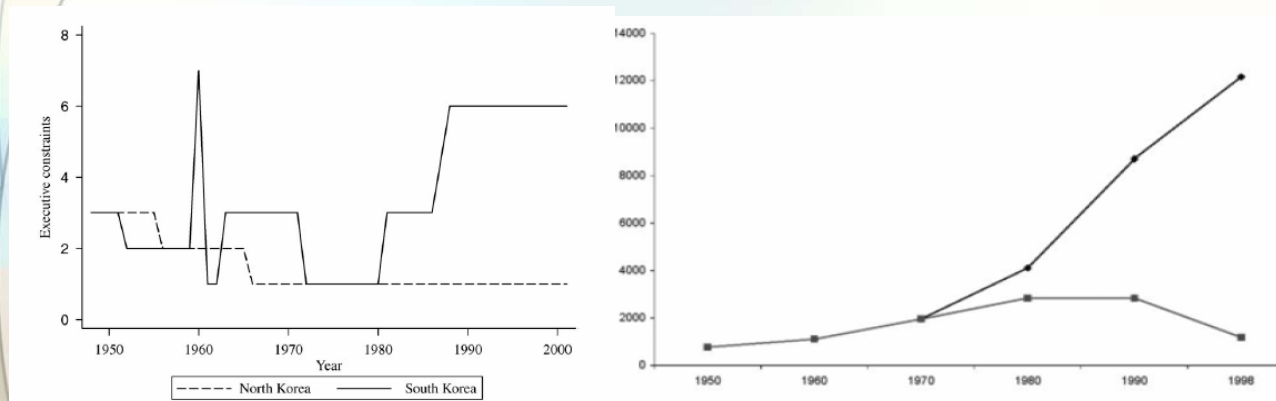
## The role of culture and religion

- What is the effect of culture?
  - Even though no comprehensive measures of broad cultural differences, evidence not favorable for importance of culture
  - Proxy for culture with religion
    - No evidence of any effect of religion (therefore culture) on cross-country differences in income
- Identity of the colonizer (British, non-British colonial origin) has no independent effect and does not seem to affect the estimated coefficient
- What seems to matter is INSTITUTIONS!

## An alternative view: GLLS 2004

## Glaeser, La Porta, Lopez-de-Silanes and Shleifer (2004)

- North vs. South Korea: story is not that simple



- Growth may have come first (as a choice of a pro-growth dictator), and only after that constraints on executive (democracy) appeared

## GLLS (JEG 2004): Institutionalists vs Lipset

1. Need to start with democracy and checks on government as a mechanism of securing property rights; investment in human and physical capital will follow (AJR)

VS

2. Need investment in human capital, growth will follow, growing countries with educated people choose democracy (Lipset 1960)

## Measurement of institutions

GLLS: All standard measures of institutions are outcomes:

- “These measures do not code dictators, who choose to respect property rights, any differently than democratically elected leaders who have no choice but to respect them”
- “Contracts on executive powers” are the closest of the true measure (use North’s definition)

AJR: Indeed, measures are outcomes

- Explain how secure private property rights emerged in equilibrium
- If this were not so, there would have been no point in worrying about instruments
- “Constraints on the executive” is itself is an outcome

## Measurement of institutions (2)

GLLS: These measures not highly correlated with “parchment” political institutions such as features of constitutions

AJR:

- Specific institutional features have no simple implications for security of property
- Constitutions do not constraint politics in Congo and Zimbabwe in the same way as it does in the US
- Focus on broad cluster of institutions
  - Settler mortality is a good instrument for this cluster
  - the exact mix of institutions varies for many idiosyncratic reasons, but there is a distinctive “package” that distinguishes Latin from North America; North from South Korea

## Change and Persistence of institutions

GLLS: measures of institutions rise with income and are volatile; while institutions are permanent

AJR: After independence many specific institutions in Latin America changed

- Did everything change? No. Much of the underlying structure of *political power* and therefore economic institutions remained
- Formal political institutions are, at most, only one part of this

## Regressions with Human Capital and Institutions

GLLS: Add human capital (schooling) as a regressor in the growth regressions together with institutions; institutions are not robust, in some subsamples - insignificant

AJR: HC accumulation is a *proximate* source of growth

- HC in a channel through which institutions influence growth (there are others)

## Validity of IV approach (1)

GLLS: Settler mortality not a valid instrument -

Proxy for current disease environment which has a direct effect on income level

- Both settler mortality and current malaria are significant in explaining “constraints on executives”

AJR: The main problem with this is that current incidence of Malaria is an outcome

- Africa countries have poor institutions and, in consequence, cannot organize public health measures necessary to eradicate diseases

## Validity of IV approach (1)

- GLLS: Settler mortality not a valid instrument - Europeans brought human capital
- AJR: By the 19<sup>th</sup> century, the US had much higher literacy and educational attainment than Latin America
  - Seems plausible that the Europeans who moved to North America had higher human capital than the Spanish who settled Latin America. But, it is wrong!
  - Latin America: Average literacy of conquistadors 78% (in Spain - 50%).
    - conquistadors mostly were hidalgos, second and third sons of nobles who could not inherit land under Spanish law
  - North America: 41.2%; Australia: as well
  - Thus, by the 19<sup>th</sup> century, North America was ahead of Latin America in terms of educational attainment as a *consequence* of not ruining private incentives to acquire human capital

## Was Lipset Right?

- GLLS (2004): in X-country - a stylized fact that higher income per-capita and educational attainment are associated with greater democracy and other institutions
- This relationship turns out not to be robust to fixed effects (but this could be just because human capital does not change that much) or to inclusion of settler mortality and population density in 1500
  - Overall, it could very well be that both stories are right; but the settler mortality is a good source of exogenous variation in institutions, AJR seems to estimate causal effect

## Reversal of Fortune

AJR (QJE 2002)

## AJR 2002 QJE

- “Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution”
- Those countries that were rich in 1500 (before colonization) are underdeveloped now
  - Population density in 1500 is a measure of prosperity then
  - European settlers were less likely to settle in densely populated areas
  - Settlements → persistent institutions
- Institutions turned out to be important in the 19<sup>th</sup> century industrialization

## Unbundling Institutions

Acemoglu and Johnson (JPE 2005)

## Unbundling Institutions

- Aim to learn about the relative importance of **contracting institutions** versus **property rights**
- Contracting institutions (cost of enforcing private contracts)
  - Measured by “Legal formalism” - the number of formal legal procedures necessary to resolve a simple case of collecting on an unpaid check or evicting a non-paying tenant (Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2002, 2003)
- Property rights institutions (protection against government expropriation)
  - Measured by Expropriation risk and Constraints on the executive

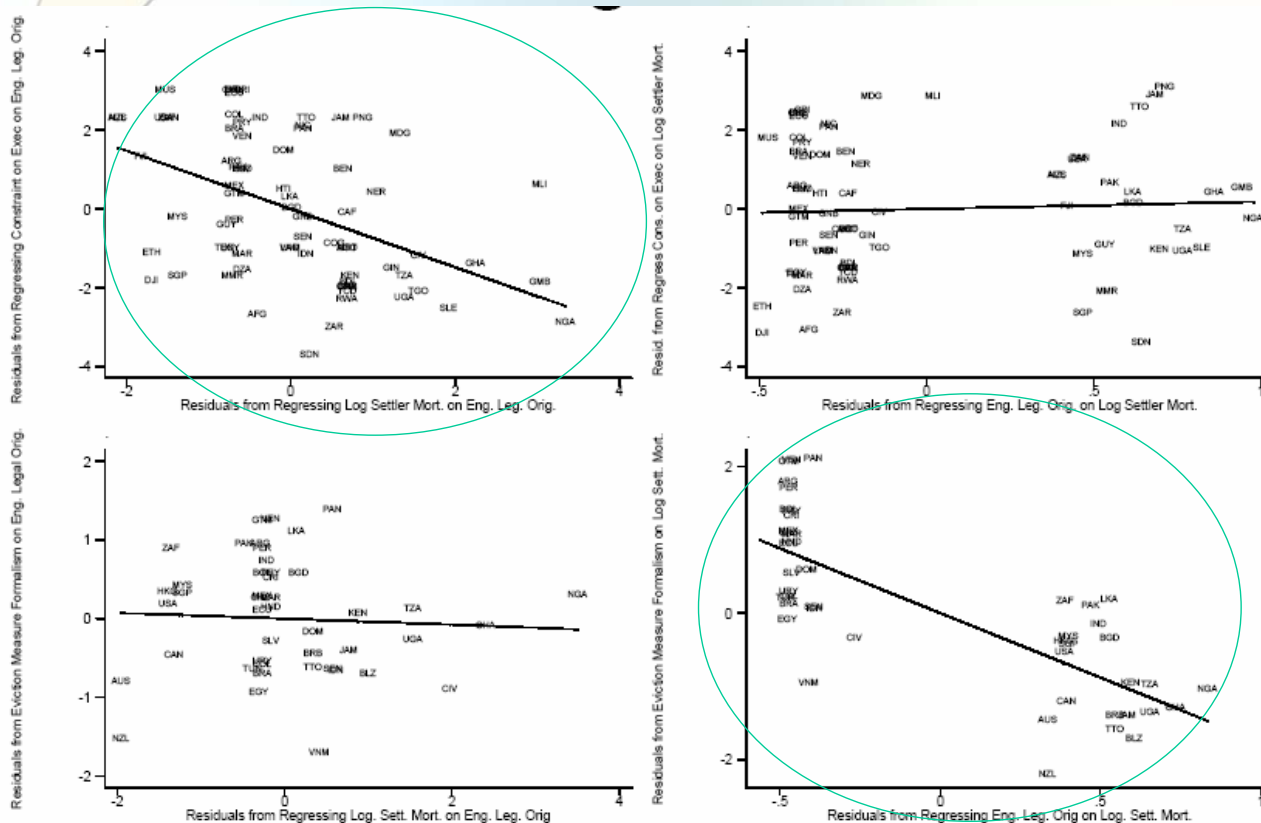
## Both institutions are correlated with outcomes...

- In OLS regressions, long-run economic growth, investment rates, and financial development are correlated with both contracting institutions and property rights institutions
- However, for a causal effect need instruments...

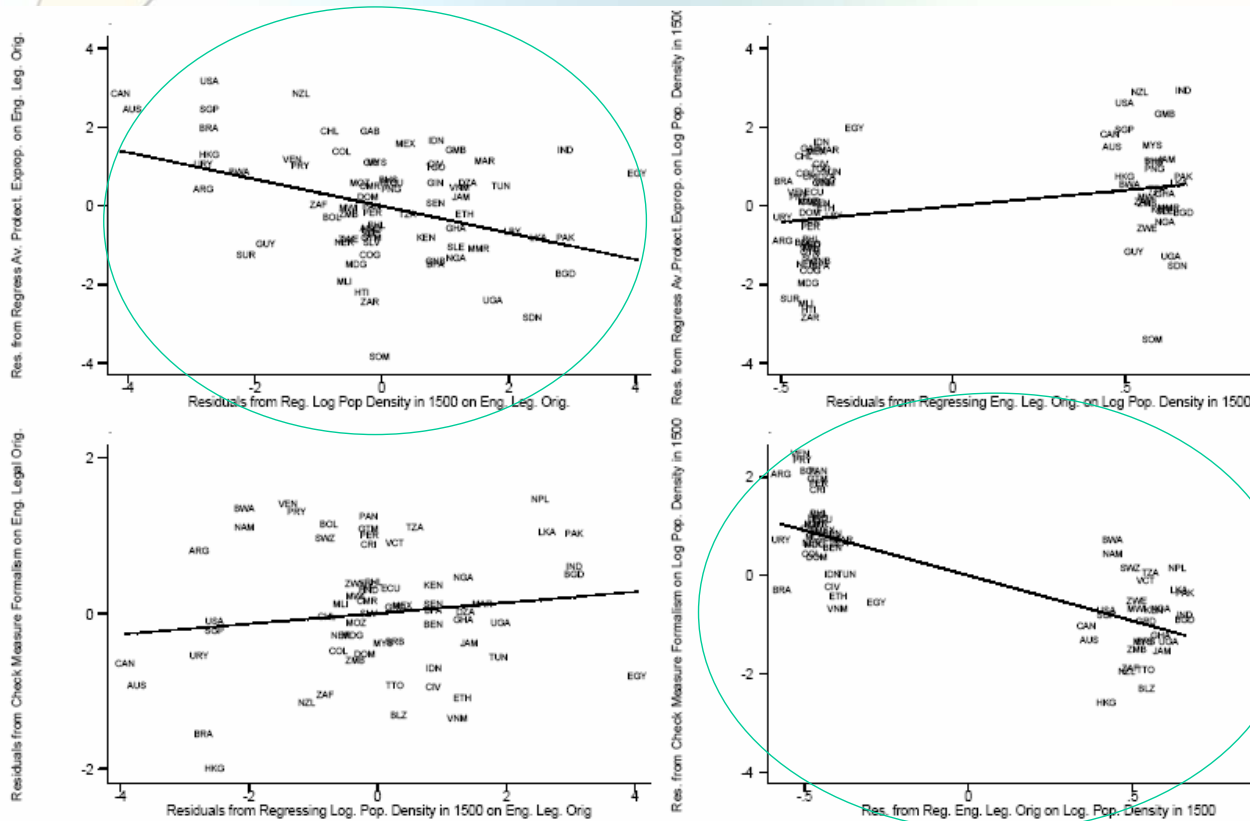
# Literature offers instruments...

- DLLS (2002, 2003) and LLSV (1997, 1998) →
  - French vs non-French “legal origin” (identity of a colonizer)
- AJR (2001, 2002)
  - Settler mortality and population density in 1500
- In the sample of former European colonies:
  - Legal origin has a strong effect on legal formalism, and (almost) no effect on property rights
  - Mortality rates for potential settlers and population density in 1500 affect current property rights institutions, and have no impact on legal formalism

## 1<sup>st</sup> stage – with settler mortality



# 1-st state with 1500 population density



*Dependent variable is annual average growth rate of GDP per capita, 1970-95*

	2SLS, with Protection Against Risk of Expropriation & Check Measure		2SLS, with Protection Against Risk of Expropriation & Eviction Measure		2SLS, with Constraint on Exec. & Check Measure		2SLS, with Constraint on Exec. & Eviction Measure	
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Panel A: OLS or Second Stage Regression, with log settler mortality as instrument								
Average Protection Against Risk of Expropriation	0.64 (0.20)	1.00 (0.32)	0.59 (0.22)	0.99 (0.38)				
Constraint on Executive					-0.07 (0.15)	1.00 (0.52)	-0.05 (0.15)	0.68 (0.38)
Legal Formalism (Check Measure)	-0.08 (0.21)	0.13 (0.31)			-0.38 (0.20)	-0.10 (0.41)		
Legal Formalism (Eviction Measure)			0.11 (0.25)	0.25 (0.36)			-0.21 (0.22)	-0.05 (0.38)
R-squared in OLS	0.29		0.19		0.07		0.03	
Number of Observations	47	47	40	40	47	47	39	39

## Results

- Countries with greater constraints on politicians and elites, and more protection against expropriation by these powerful groups, have:
  - substantially higher income per capita (i.e., higher long-run growth rates), greater investment rates, more credit to the private sector relative to GDP, and more developed stock markets
- Countries with greater legal formalism have:
  - less developed stock markets (form of financial intermediation)
  - **NO** impact on income per capita, the investment to GDP ratio, and the private credit to GDP ratio

## Conclusions from the lecture

- Convincing evidence that overall cluster of institutions matter. Douglass North was right.
- Convincing evidence that limiting power of the state is immensely important for growth and contracting institutions on financial markets
  - Some evidence that enabling contracts between private parties does not have a direct causal effect on growth
    - Interpretation: individuals can structure contracts to reduce the adverse effects from contracting institutions, e.g., by changing the form of intermediation
    - This may be less substantiated, however, because it is not clear to what extent the number of procedures needed is a good measure of quality of enforcement of contracts between private parties.
      - Yet, AJ provide some evidence that the measures are related to firms' perceptions of problems with enforcing private contracts