

Institutions and Development

Political Economics: Week 6, Part 3

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Colonialism and Institutional Persistence

Acemoglu, Johnson, and Robinson's (2001) theory of institutions.

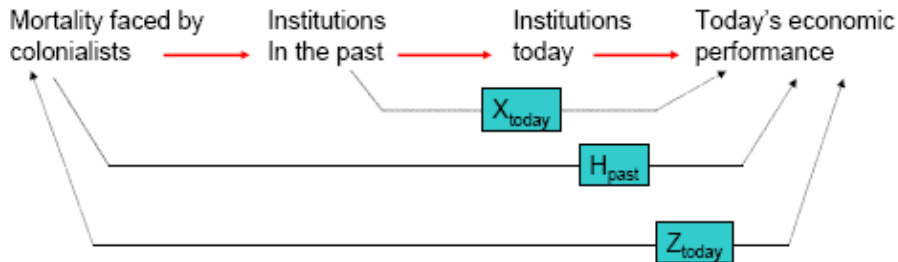
- ① Different types of colonization policies created different sets of institutions.
 - ① Replicas of European institutions with an emphasis on private property and checks on the government.
 - ② Extractive institutions whose main purpose was to transfer the resources of the colony to the colonizer.
- ② The colonization strategy depended on the feasibility of settlements.
 - ① Colonies with many European settlers became “Neo-Europes” such as the U.S., Canada, Australia, and New Zealand.
 - ② European colonizers plundered colonies that they did not settle, the most (in)famous example being Belgian Congo.
- ③ Colonial institutions persisted after independence and to this day.

Settlers' Mortality

- AJR's instrument is the mortality rate of European colonists stationed in a sample of colonies that correspond to 64 present-day countries.
- Most of the data is on soldiers and sailors in the XIX century, from Curtin (1989, 1998).
- For South America, Gutierrez (1986) uses Vatican records to estimate mortality of bishops from 1604 to 1876.
- The disease environment was known to contemporary Europeans, who were essentially powerless against it, and chose where to settle accordingly.
- The main scourges were malaria and yellow fever, accounting for 80% of European deaths in the tropics. Gastrointestinal diseases represented another 15%.

Is Settler Mortality a Valid Instrument?

- Exclusion restriction

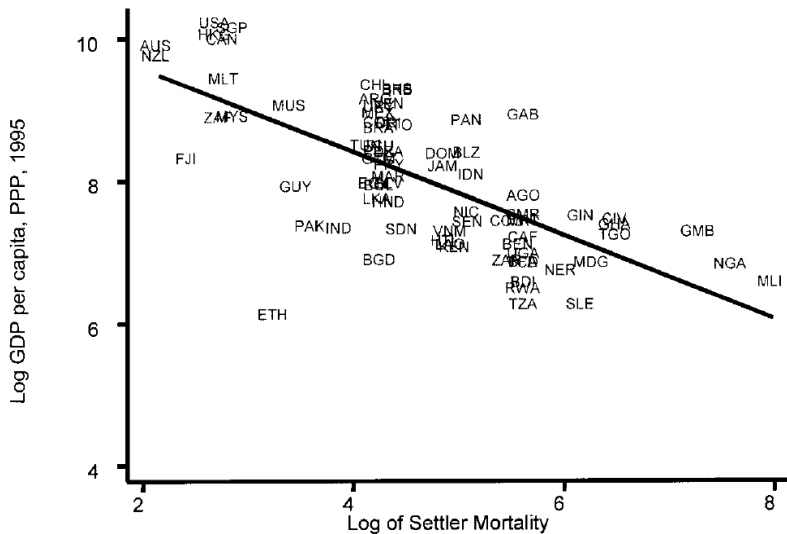


- For legal origin to be a valid instrument for current institutions, none of the links X_{today} , H_{past} , Z_{today} must be valid.
- Moreover, institutions must be persistent: a non-trivial hypothesis.

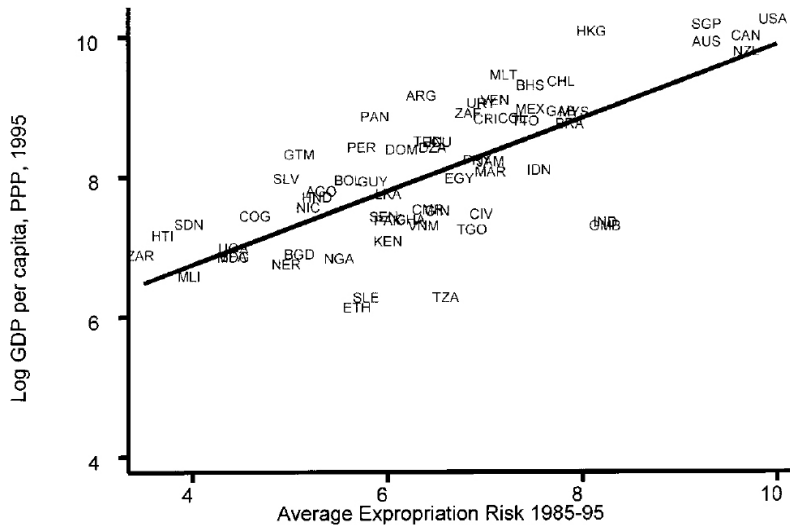
Descriptive Statistics

| | Whole world | Base sample | By quartiles of mortality | | | |
|---|----------------|----------------|---------------------------|-------|-------|-------|
| | | | (1) | (2) | (3) | (4) |
| Log GDP per capita (PPP) in 1995 | 8.3 (1.1) | 8.05 (1.1) | 8.9 | 8.4 | 7.73 | 7.2 |
| Log output per worker in 1988 (with level of United States normalized to 1) | -1.70 (1.1) | -1.93 (1.0) | -1.03 | -1.46 | -2.20 | -3.03 |
| Average protection against expropriation risk, 1985-1995 | 7 (1.8) | 6.5 (1.5) | 7.9 | 6.5 | 6 | 5.9 |
| Constraint on executive in 1990 | 3.6 (2.3) | 4 (2.3) | 5.3 | 5.1 | 3.3 | 2.3 |
| Constraint on executive in 1900 | 1.9 (1.8) | 2.3 (2.1) | 3.7 | 3.4 | 1.1 | 1 |
| Constraint on executive in first year of independence | 3.6 (2.4) | 3.3 (2.4) | 4.8 | 2.4 | 3.1 | 3.4 |
| Democracy in 1900 | 1.1 (2.6) | 1.6 (3.0) | 3.9 | 2.8 | 0.19 | 0 |
| European settlements in 1900 | 0.31 (0.4) | 0.16 (0.3) | 0.32 | 0.26 | 0.08 | 0.005 |
| Log European settler mortality | n.a. | 4.7 (1.1) | 3.0 | 4.3 | 4.9 | 6.3 |
| Number of observations | 163 | 64 | 14 | 18 | 17 | 15 |

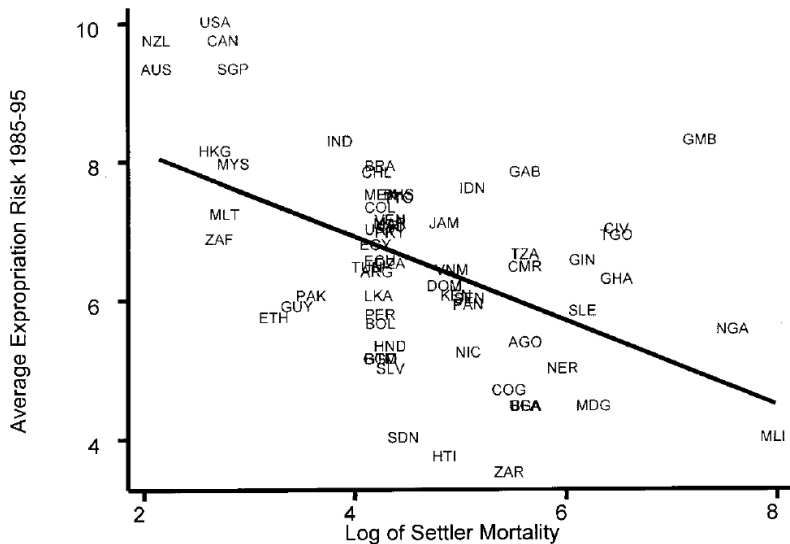
Settler Mortality and Income



Expropriation Risk and Income



Settler Mortality and Expropriation Risk



| | 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) | Base sample, dependent variable is log output per worker (9) |
|---|--------------------|--------------------|---|---|--------------------------------------|--------------------------------------|--|--|---|
| Panel A: Two-Stage Least Squares | | | | | | | | | |
| 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) | 0.98 (0.17) |
| 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) | |

| | | | | | | | | | |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995 | | | | | | | | | |
| 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) | −0.63 (0.13) |
| 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 ² | 0.27 | 0.30 | 0.13 | 0.13 | 0.47 | 0.47 | 0.30 | 0.33 | 0.28 |

| | | | | | | | | | |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Panel C: Ordinary Least Squares | | | | | | | | | |
| 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) | 0.46 (0.06) |
| Number of observations | 64 | 64 | 60 | 60 | 37 | 37 | 64 | 64 | 61 |

Robustness Checks

Other colonial legacies

- 1 Identity of the colonial power: did Britain bequeath better institutions?
- 2 Legal origins: do common law countries have better institutions?
- 3 Religion: is the Protestant ethic associated with better institutions?

Present-day disease environment

- Endogenous: malaria can be eradicated, and it has been in formerly malarial region of developed countries.
- Debate with McArthur and Sachs (2001).
- “most people who live in high malaria areas have developed some immunity to the disease ... Malaria should therefore have little direct effect on economic performance”.

| | 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) |
| <i>p</i> -value for religion variables | | | | | | | [0.001] | [0.004] | [0.42] |

Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995

| | | | | | | | | | |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 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^2 | 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) |
| Number of observations | 64 | 64 | 25 | 25 | 64 | 64 | 64 | 64 | 64 |

| | Instrumenting only for average protection against expropriation risk | | | | | | Instrumenting for all right-hand-side variables | | | Yellow fever instrument for average protection against expropriation risk | |
|---|--|-----------------|-----------------|-----------------|------------------|------------------|---|-----------------|-----------------|---|-----------------|
| Panel A: Two-Stage Least Squares | | | | | | | | | | | |
| Average protection against expropriation risk, 1985–1995 | 0.69 (0.25) | 0.72 (0.30) | 0.63 (0.28) | 0.68 (0.34) | 0.55 (0.24) | 0.56 (0.31) | 0.69 (0.26) | 0.74 (0.24) | 0.68 (0.23) | 0.91 (0.24) | 0.90 (0.32) |
| Latitude | | −0.57 (1.04) | | −0.53 (0.97) | | −0.1 (0.95) | | | | | |
| Malaria in 1994 | −0.57 (0.47) | −0.60 (0.47) | | | | | −0.62 (0.68) | | | | |
| Life expectancy | | | 0.03 (0.02) | 0.03 (0.02) | | | | 0.02 (0.02) | | | |
| Infant mortality | | | | | −0.01 (0.005) | −0.01 (0.006) | | | −0.01 (0.01) | | |
| Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995 | | | | | | | | | | | |
| Log European settler mortality | −0.42 (0.19) | −0.38 (0.19) | −0.34 (0.17) | −0.30 (0.18) | −0.36 (0.18) | −0.29 (0.19) | −0.41 (0.17) | −0.40 (0.17) | −0.40 (0.17) | | |
| Latitude | | 1.70 (1.40) | | 1.10 (1.40) | | 1.60 (1.40) | −0.81 (1.80) | −0.84 (1.80) | −0.84 (1.80) | | |
| Malaria in 1994 | −0.79 (0.54) | −0.65 (0.55) | | | | | | | | | |
| Life expectancy | | | 0.05 (0.02) | 0.04 (0.02) | | | | | | | |
| Infant mortality | | | | | −0.01 (0.01) | −0.01 (0.01) | | | | | |
| Mean temperature | | | | | | | −0.12 (0.05) | −0.12 (0.05) | −0.12 (0.05) | | |
| Distance from coast | | | | | | | 0.57 (0.51) | 0.55 (0.52) | 0.55 (0.52) | | |
| Yellow fever dummy | | | | | | | | | | −1.10 (0.41) | −0.81 (0.38) |
| R ² | 0.3 | 0.31 | 0.34 | 0.35 | 0.32 | 0.34 | 0.37 | 0.36 | 0.36 | 0.10 | 0.32 |
| Panel C: Ordinary Least Squares | | | | | | | | | | | |
| Average protection against expropriation risk, 1985–1995 | 0.35 (0.06) | 0.35 (0.06) | 0.28 (0.05) | 0.28 (0.05) | 0.29 (0.05) | 0.28 (0.05) | 0.35 (0.06) | 0.29 (0.05) | 0.29 (0.05) | 0.48 (0.06) | 0.39 (0.06) |
| Number of observations | 62 | 62 | 60 | 60 | 60 | 60 | 60 | 59 | 59 | 64 | 64 |

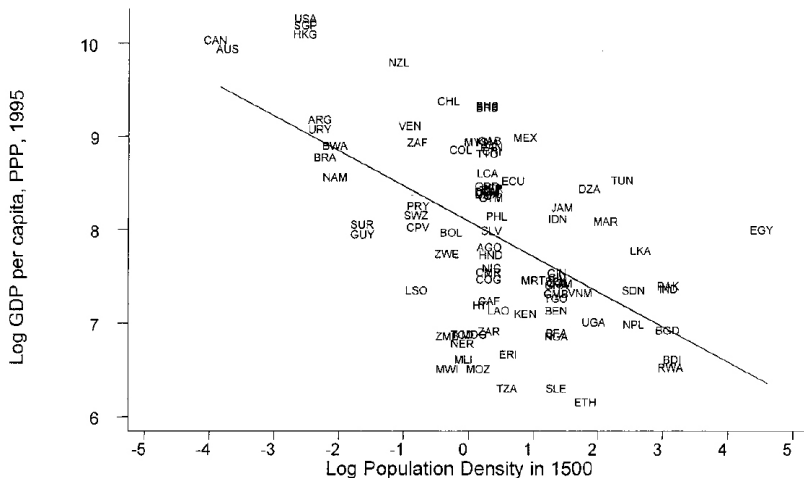
Data Controversy

- ① Of the 64 countries in the AJR sample, only 28 have mortality rates that originate from their own borders. The other 36 are assigned rates based on assumed similarity of the disease environments to those of other countries.
 - ② Bishop mortality data are based on 19 deaths and account for 16 countries.
 - ③ Soldier mortality rates are not homogeneous: sometime they come from peacetime, sometime they come from military expeditions.
- David Albouy has been challenging the AJR data, and he is now at the third revision for the AER. He attempts to clean the data in several ways, and the original results never survive.
 - AJR delivered two increasingly scathing replies in 2005 and 2006 and state that they have “responded to all his claims and documented that his critique was without foundation.”

Reversal of Fortune

- AJR (2002) focus on another predetermined local condition that influenced colonial institutions: economic development.
- Less densely populated and less urbanized regions were more likely to become settlement colonies and receive institutions of private property from European settlers.
- Originally richer areas were instead conquered by a small elite that concentrated power and established extractive institutions.
- The institutional reversal can explain the observed reversal in the relative incomes of former colonies between 1500 and 2000.
- The reversal mostly occurs around 1800, consistent with the view that good institutions are required for industrialization.
- Identification relies on settler mortality.

Population Density in 1500 and Present-Day Income



| Institutions as measured by: | Dependent variable is log GDP per capita (PPP) in 1995 | | | | | |
|--|---|-----------------|---------------------------------------|-----------------|--|-----------------|
| | Average protection against expropriation risk, 1985–1995 | | Constraint on executive in 1990 | | Constraint on executive in first year of independence | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| <i>Panel A: Second-stage regressions</i> | | | | | | |
| Institutions | 0.52 (0.10) | 0.88 (0.21) | 0.84 (0.47) | 0.50 (0.11) | 0.37 (0.12) | 0.46 (0.16) |
| Urbanization in 1500 | −0.024 (0.021) | | 0.030 (0.078) | | −0.023 (0.034) | |
| Log population density in 1500 | | −0.08 (0.10) | | −0.10 (0.10) | | −0.13 (0.10) |
| <i>Panel B: First-stage regressions</i> | | | | | | |
| Log settler mortality | −1.21 (0.23) | −0.47 (0.14) | −0.75 (0.44) | −0.88 (0.20) | −1.81 (0.40) | −0.78 (0.25) |
| Urbanization in 1500 | −0.042 (0.035) | | −0.088 (0.066) | | −0.043 (0.061) | |
| Log population density in 1500 | | −0.21 (0.11) | | −0.35 (0.15) | | −0.24 (0.17) |
| R^2 | 0.53 | 0.29 | 0.17 | 0.37 | 0.56 | 0.26 |
| Number of observations | 38 | 64 | 37 | 67 | 38 | 67 |

Panel C: Coefficient on institutions without urbanization or population density in 1500

| | | | | | | |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Institutions | 0.56 (0.09) | 0.96 (0.17) | 0.77 (0.33) | 0.54 (0.09) | 0.39 (0.11) | 0.52 (0.15) |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|

What Do These Result Mean?

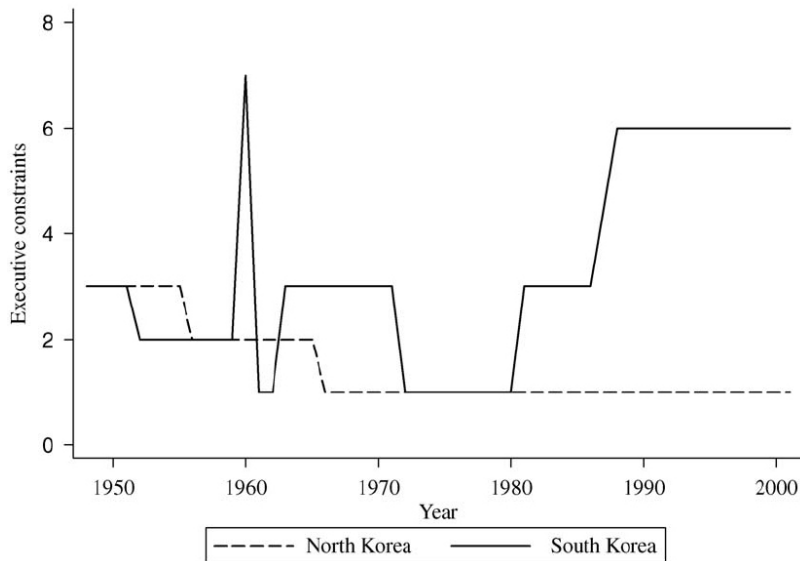
- Unlike LLSV, AJR would (I think) still stand by the exclusion restriction and argue that settler mortality is a valid instrument.
- Nevertheless, the implications of the analysis are if anything more distant from practical policy recommendations than those of the legal-origin literature.
- The second stage makes the very broad point that economic development is fostered when the government and other powerful élites are prevented from extracting rents from society.
- The contribution attracting the most attention seems to have been the first stage and the theory of long-run institutional persistence.
 - ▶ Technically, it is not an empirical result but a hypothesis needed to identify the second stage.
- The orthogonality of settler mortality remains rather controversial.

Human Capital

Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2005) argue for the primacy of human capital:

- ① Human capital directly increases productivity, both at the individual level and probably through spillovers.
 - ② Human capital leads to the creation of better institutions (Lipset 1960).
- Conventional measures of institutions actually reflect policy outcomes.
 - Desirable, pro-growth policy choices can be and have been made by unconstrained, dictatorial governments.
 - In the period 1960-2000, initial human capital predicts future growth, whereas initial institutions do not.

A Tale of Two Dictatorships



Persistence of Institutions and of Human Capital

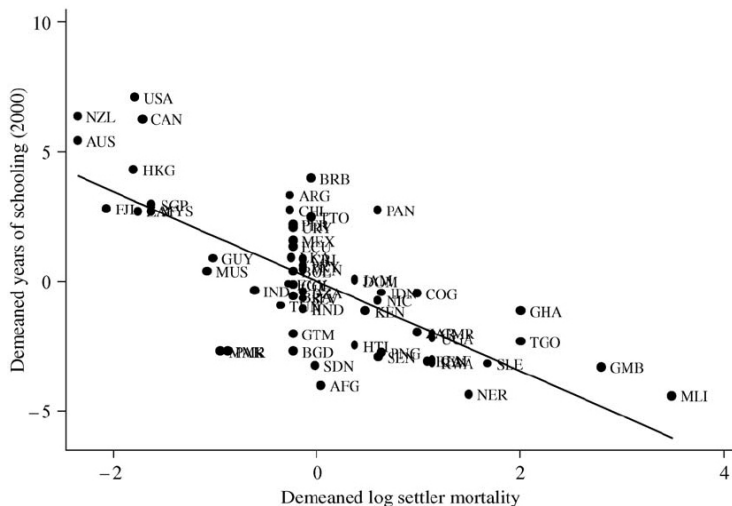
| | Dependent Variables | | | |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | Years of Schooling (2000) | Executive Constraints (2000) | Autocracy–Polity IV (2000) | Democracy (2000) |
| Years of schooling (1960) | 1.1773 ^a (0.0885) | | | |
| Executive constraints (1960) | | 0.2719 ^b (0.1246) | | |
| Autocracy–Polity IV (1960) | | | 0.1810 ^c (0.0926) | |
| Democracy (1960) | | | | 0.3065 ^b (0.1341) |
| Observations | 50 | 50 | 50 | 50 |
| R^2 | 0.73 | 0.09 | 0.07 | 0.10 |

Institutions, Settler Mortality, and Malaria

- The Z channel: AJR find present-day malaria to be insignificant, but a different sample yields a significant impact.

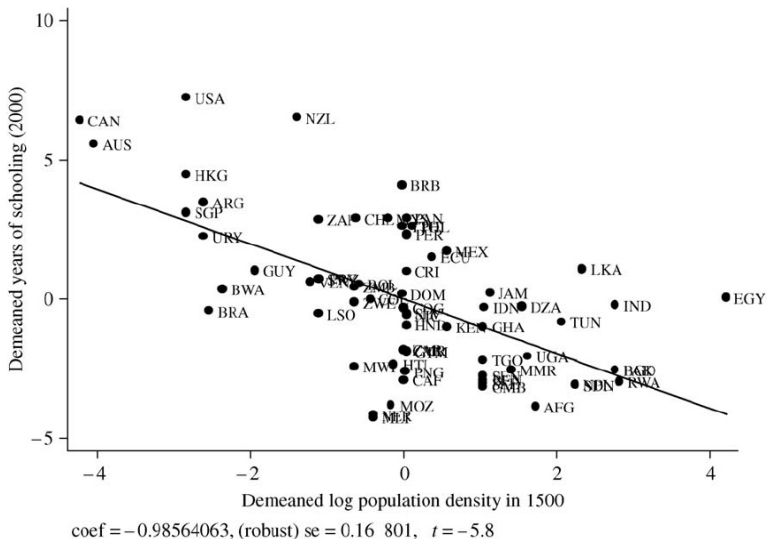
| | Dependent Variables | | | |
|---|--------------------------------------|-----------------------------------|--------------------------------------|---|
| | Executive Constraints (1960–2000) | Expropriation Risk (1982–1997) | Autocracy— Alvarez (1960–1990) | Government Effectiveness (1998–2000) |
| Log settler mortality | – 0.4351 ^b (0.1965) | – 0.3543 ^b (0.1764) | 0.0938 ^c (0.0507) | – 0.2034 ^b (0.0918) |
| Population at risk of malaria (1994) | – 1.5215 ^a (0.5504) | – 0.9679 ^b (0.3731) | 0.4397 ^a (0.1597) | – 0.7745 ^a (0.2133) |
| Observations | 74 | 66 | 74 | 77 |
| R^2 | 0.36 | 0.32 | 0.29 | 0.43 |

Settler Mortality and Education



coef = -1.727679, (robust) se = 0.20195631, $t = -8.55$

Population Density in 1500 and Education



Panel A: Second-stage regressions

| | Dependent variable is log GDP per capita in 2000 | |
|---|--|---------------------------------|
| | (1) | (2) |
| Years of schooling (1960-2000) | 0.7894 ^a (0.2753) | 0.4836 ^b (0.1875) |
| Executive constraints (1960-2000) | -0.3432 (0.2577) | -0.2965 (0.2410) |
| Share of population living in temperate zone (1995) | -1.6969 (1.2053) | -0.0863 (0.7714) |
| Observations | 47 | 55 |
| R ² | 0.31 | 0.5 |

Panel B: First-stage regressions

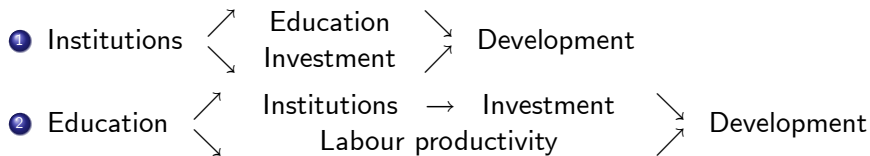
| | Dependent variables: | | | |
|---|--------------------------------------|-----------------------------------|--------------------------------------|-----------------------------------|
| | Executive constraints (1960-2000) | Years of schooling (1960-2000) | Executive constraints (1960-2000) | Years of schooling (1960-2000) |
| Share of population living in temperate zone (1995) | -0.1195 (0.7202) | 3.4975 ^a (0.8044) | -0.0353 (0.8359) | 2.8397 ^a (0.8933) |
| Log settler mortality | -0.8212 ^a (0.2053) | -1.0183 ^a (0.2293) | | |
| Log population density in 1500 | | | -0.3737 ^b (0.1582) | -0.6140 ^a (0.1691) |
| French legal origin | -1.4124 ^a (0.4258) | -0.3770 (0.4757) | -1.1988 ^b (0.4538) | -0.5329 (0.4850) |
| Observations | 47 | 47 | 55 | 55 |
| R ² | 0.53 | 0.70 | 0.25 | 0.55 |
| F-Test for excluded instruments | 17.23 | | 4.70 | |
| Correlation of predicted values of executive constraints and years of schooling | 0.8182 | | 0.8163 | |

AJR v. GLLS

Agreement:

- ① Wealthy countries have educated citizens and good government:
 - ▶ .88 correlation between income and education;
 - ▶ .73 correlation between income and expropriation risk;
 - ▶ .75 correlation between education and expropriation risk.
- ② Good policies are very important for economic development:
 - ▶ protection of property rights;
 - ▶ open economy;
 - ▶ efficient government.

Disagreement:



The Chicken and the Egg

- Human capital and good institutions are endogenous and highly correlated: intuitively, they cause each other.
- Human capital and “deep” institutions are highly persistent: most of the variation is at the country level, and thus correlates with geography, culture, and other confounds.
- As a consequence, fully convincing, strongly identified empirical results are extremely elusive.
- History lends itself to different sensible readings: thus strong priors are impervious to suggestive evidence-based narratives.
- Does the causal order matter for practical purposes?
- Maybe different policy recommendations: export institutions or provide education.
- But AJR also think of the underlying conditions that create a divide between an élite and the rest of society and allow the persistence of extractive institutions, or induce their dismantling.