ECON 3510: Poverty and Economic Development
Lecture 2: Economic Institutions

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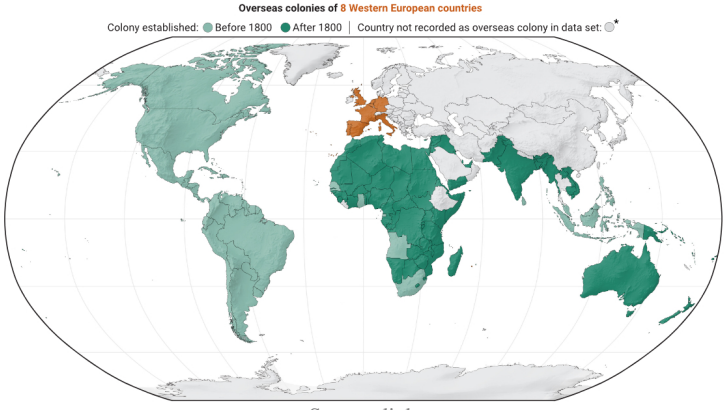
Empirical Paper

- Acemoglu, Daron, Simon Johnson, and James A Robinson (2001). "The colonial origins of comparative development: An empirical investigation". *American Economic Review* 91.5, pp. 1369–1401.

European Colonization

- Since the 15th century, European powers conquered many nations in the world.



Source: link

Legacy of European Colonization

- Now former colonies are independent. They exhibited huge variation in economic performance today.
  - US, Canada, Australia
  - Congo, Nigeria, Haiti

- Acemoglu, Johnson, and Robinson (2001): Europeans established different institutions in different colonies. These institutions live on in modern days and affect economic performance.

- AJR (2001) look at property rights protection: measured by *average protection against expropriation risk* (scale from 1 to 10), from Political Risk Services, averaged over 1985–1995.
  - 1 = highest expropriation risk, bad institutions.
  - 10 = lowest expropriation risk, good institutions.

- *Why is protection of property rights important?*
  - Without being assured that the assets you pay for now won't be taken away in the future, people have weak incentives to do investments and transactions.
  - Without institutional protection, people have to make private efforts to protect their own properties, which crowds out other economic activities (e.g., work).

Importance of Property Rights: Besley (1995)

- In Ghana, farmers invest more in their land if they had the transfer rights of the land (subject to lineage approval or not).

ANLOGA: NEW INVESTMENTS (N = 494)

	Drainage	Continuous Manuring	Land Excavation	Irrigation	Mulching	Making Shallot Beds
Rights with approval	.07	.01	.08	−.02	.05	.07
	(4.65)	(.66)	(4.94)	(1.18)	(3.28)	(4.96)
Rights without approval	.08	.01	.09	−.01	.05	.08
	(6.20)	(1.30)	(6.12)	(.38)	(3.59)	(6.03)

Note: Absolute values of t statistics are in the parentheses.

Importance of Property Rights: Field (2007)

- Since the 1980s, Peru's implicit housing policy allowed rural-urban migrants to settle on unused government-owned lands.
- Due to the lack of formal registration and the cost of relying on judicial system to resolve disputes, some household members stayed at home to deter possible invaders from robbing properties.
- In 1996, the Peruvian government initiated a program to help these squatters to obtain formal property right registration.
- After the reform, squatter households' hours worked increased—they now felt more secure to go out to work.

Field (2007) Main Result

	Total Household Hours
Squatter	−7.65
	[4.41]+
Squatter*program	13.50
	[6.63]*

Importance of Property Rights: He et al. (2024)

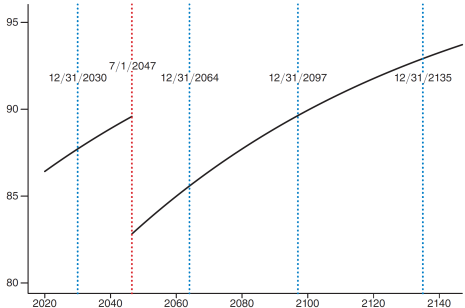
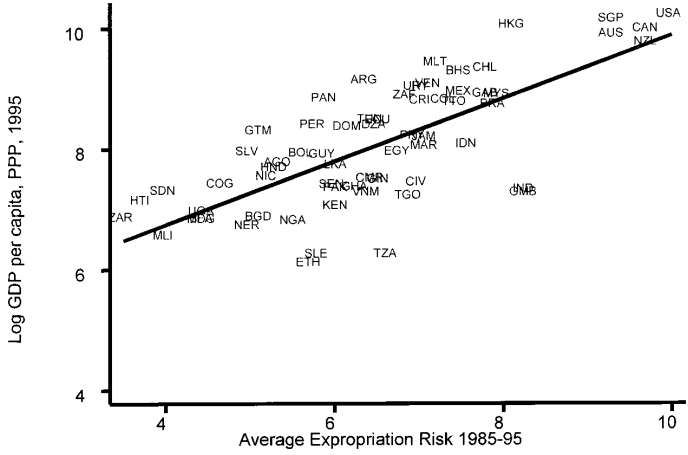


FIGURE 1. MODEL-IMPLIED HOUSE VALUES COUNT ACROSS LEASES

- He et al. (2024) find that in Hong Kong, homes with land leases set to expire after July 1, 2047 are valued 8% lower.
- Why? Property rights matter!
- Hong Kong was handed over by the UK to China on July 1, 1997. The Chinese government allows Hong Kong to preserve its capitalist institutions, with a promise of 50 years (*"One Country, Two Systems"*).
- All land in HK is government-owned. The land is leased to the homeowner by the government (lease = home ownership).
- For leases set to expire before June 30, 2047, the government granted an automatic 50-year extension.
- Nothing is promised for leases set to expire after July 1, 2047.
- Consumers take into account the uncertainty of property rights and discount those homes.

Back to AJR (2001) – Institutions and Economic Performance



OLS Estimate

- AJR (2001) estimate using a sample of 64 former colonies:

$$\log y_i = \mu + \alpha R_i + \mathbf{X}_i'\gamma + \varepsilon_i,$$

  where y_i is GDP per capital in 1995, R_i is average expropriation risk, and $\mathbf{X}_i$ is a set of control variables.

- Baseline OLS estimate (without controls): $\hat{\alpha} = 0.52$ ($SE = 0.06$).

- Note: R_i is a qualitative variable from 0 to 10. Its value may not have much economic meaning. What does one unit change in R_i mean?

- How to interpret $\hat{\alpha}$? AJR offers a nice way:
  - Nigeria is at 25th percentile of R_i (5.6), while Chile is at 75th (7.8). Thus, the Nigeria-Chile gap is 2.2.
  - The impact of improving Nigeria's property rights protection to Chile's level is $0.52 \times 2.2 = 1.14$ log points.
  - 1.14 log points means $\exp(1.14) - 1 = 210\%$ increase in GDP per capita!

Causality?

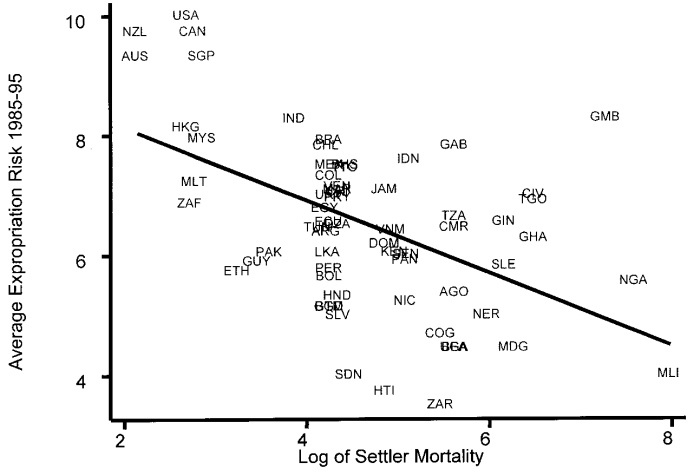
- Should we interpret $\hat{\alpha} = 2.2$ as causal?
- **Reverse Causality.** Rich countries may be able to enforce good institutions.
  + Positive bias in OLS.
- **Omitted Variables.** Unobserved characteristics may contribute to both better economic performance and better institutions.
  + Positive bias in OLS.
- **Classical Measurement Error.** R_i may be measured with random error.
  – Negative bias in OLS.
- **Non-Classical Measurement Error.** R_i is an *ex-post* measure. Analysts may have a tendency of perceiving richer countries to have better institutions.
  + Positive bias in OLS.

IV Strategy

- To address these issues, AJR use an IV strategy. Let's walk through their idea.
- They propose that there are two types of colonies:
  - **Settler colonies:** Europeans wanted to live in these places themselves. They tried to replicate European institutions that feature protection of private properties and checks against government power. E.g., US, Canada, Australia, and New Zealand.
  - **Non-settler colonies:** In these places, Europeans were more interested in extracting resources as much as possible. Therefore, the good institutions were not introduced. E.g., Congo.
- What determines the colonization strategy? Of course a variety of factors.
- But AJR suggest one factor is the **feasibility of establishing settlements**. If settlers were likely to die in a place, they were more likely to set up the extractive institutions there.
- AJR use the settler mortality rate (M_i) as an instrument for institutions (R_i):

$$\text{settler mortality} \Rightarrow \text{settlement} \Rightarrow \text{early institutions} \Rightarrow \text{modern institutions}.$$

From Settler Mortality to Modern Institutions



Econometric Models

- They estimate the following models by 2SLS:

$$\log y_i = \mu + \alpha R_i + \mathbf{X}_i'\gamma + \varepsilon_i,$$
$$R_i = \xi + \beta \log M_i + \mathbf{X}_i'\delta + \nu_i.$$

- What conditions does $\log M_i$ need to satisfy to be a valid IV for R_i?

- **Relevance:** What is this? Settler mortality ($\log M_i$) is correlated with institutions (R_i), i.e., $\beta \neq 0$. We can check this directly in the data.

- **Exclusion:** What is this? Settler mortality affects economic performance **only** through its effect on institutions.
  - Not directly testable. We need to decide whether it is plausible or not.
  - Possible violations? The disease environment might also impact locals; poor health can result in poor economic performance. AJR argue that locals had developed immunity for those diseases, but Europeans did not.
  - Other channels: colonizer identity, geography, legal origin.

- They show that results hold when controlling for these factors.

AJR (2001) Main Results

TABLE 4—IV REGRESSIONS OF LOG GDP PER CAPITA

	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	1.00	1.28	1.21	0.58	0.58	0.98	1.10	0.98
	(0.16)	(0.22)	(0.36)	(0.35)	(0.10)	(0.12)	(0.30)	(0.46)	(0.17)
Latitude		−0.65		0.94		0.04		−1.20	
		(1.34)		(1.46)		(0.84)		(1.8)	
Asia dummy							−0.92	−1.10	
							(0.40)	(0.52)	
Africa dummy							−0.46	−0.44	
							(0.36)	(0.42)	
"Other" continent dummy							−0.94	−0.99	
							(0.85)	(1.0)	
Panel B: First Stage for Average Protection Against Expropriation Risk in 1985–1995									
Log European settler mortality	−0.61	−0.51	−0.39	−0.39	−1.20	−1.10	−0.43	−0.34	−0.63
	(0.13)	(0.14)	(0.13)	(0.14)	(0.22)	(0.24)	(0.17)	(0.18)	(0.13)
Latitude		2.00		−0.11		0.99		2.00	
		(1.34)		(1.50)		(1.43)		(1.40)	
Asia dummy							0.33	0.47	
							(0.49)	(0.50)	
Africa dummy							−0.27	−0.26	
							(0.41)	(0.41)	
"Other" continent dummy							1.24	1.1	
							(0.84)	(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	0.47	0.49	0.47	0.48	0.47	0.42	0.40	0.46
	(0.06)	(0.06)	(0.08)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)
Number of observations	64	64	60	60	37	37	64	64	61

OLS vs. IV Estimates

- $\hat{\alpha}_{IV} = 0.94 > \hat{\alpha}_{OLS} = 0.52$. How should we interpret this change in the coefficient?
- Recall that OLS can be upward biased due to endogeneity of three kinds: (i) reserve causality, (ii) omitted variables, and (iii) non-classical measurement error. OLS is downward biased due to classical measurement error.
- AJR thus interpret the OLS-IV gap as suggesting "measurement error in the institutions variables that creates attenuation bias is likely to be more important."
- Another possibility: The economic effects of institutions are heterogeneous; IV estimates a **LATE**, i.e., the average effect among **compliers** of the IV.
  - What assumption do we need for a LATE interpretation?
    - *Monotonicity: High mortality always makes Europeans more likely to settle and bring good institutions.* ✓ Seems plausible.
  - Who are the **compliers** here?
    - Places that had good institutions **only** because of Europeans' settlements and otherwise would not.
    - Do we think economic effects of institutions would be substantially larger in these places? Open question.
- Be sure to think about how IV differs from OLS! (i) Endogeneity, (ii) classical measurement error; and (iii) LATE.

Robustness I

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]

Robustness II

TABLE 6—ROBUSTNESS CHECKS FOR IV REGRESSIONS OF LOG GDP PER CAPITA

	Base sample (1)	Base sample (2)	Base sample (3)	Base sample (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	0.84 (0.19)	0.83 (0.21)	0.96 (0.28)	0.99 (0.30)	1.10 (0.33)	1.30 (0.51)	0.74 (0.13)	0.79 (0.17)	0.71 (0.20)
Latitude		0.07 (1.60)		−0.67 (1.30)		−1.30 (2.30)		−0.89 (1.00)	−2.5 (1.60)
p-value for temperature variables	[0.96]	[0.97]							[0.77]
p-value for humidity variables	[0.54]	[0.54]							[0.62]
Percent of European descent in 1975			−0.08 (0.82)	0.03 (0.84)					0.3 (0.7)
p-value for soil quality					[0.79]	[0.85]			[0.46]
p-value for natural resources					[0.82]	[0.87]			[0.82]
Dummy for being landlocked					0.64 (0.63)	0.79 (0.83)			0.75 (0.47)
Ethnolinguistic fragmentation							−1.00 (0.32)	−1.10 (0.34)	−1.60 (0.47)

Robustness III

TABLE 7—GEOGRAPHY AND HEALTH VARIABLES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	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)		

Influence of AJR (2001)

- AJR (2001) represents a significant contribution to the institutional view of economic development.
- Note: Acemoglu has 266,378 citations, one of the most cited economists in the world. AJR (2001) is his top with 19,469.
- Along with other work on institutions, Acemoglu, Johnson and Robinson were awarded the 2024 Nobel Prize in Economics.

Source: Twitter

Remaining Questions on AJR (2001)

- Some are econometric: AJR (2001)'s regressions use the default OLS standard errors, i.e., assuming error terms $\{\varepsilon_i\}$ are *i.i.d.*
  - These days people won't be comfortable assuming homoskedasticity. A minimum is heteroskedasticity-robust SEs, i.e., `regress y x, r`.
  - Albouy (2012) points out that AJR (2001) extrapolated some mortality rates, thus, some countries have identical numbers. SEs should be clustered.
  - More generally, Conley and Kelly (2025) argue that the "long-term effects" may be confounded by spatial trends and autocorrelation; they recommend clustering by spatial units.
  - In a follow-up paper, Acemoglu, Johnson, and Robinson (2012) address some concerns.

Remaining Questions on AJR (2001)

- More substantive questions: AJR (2001) *assume* that early institutions that Europeans introduced persisted to modern days. But how? Also, why did Europe develop better institutions at the first place?
  - They somewhat take persistence of good institutions for granted, and argue that the bad type may persist due to the difficulty of constraining elites and the strong support of constituents created by the institution.
  - They provide some arguments on the origin of European institutions in their other work (Acemoglu and Robinson, 2000; Acemoglu, Johnson, and Robinson, 2005), emphasizing the role of middle classes who demand political rights.
  - Nonetheless, **institutional change** is far from fully understood. We shall discuss some explanations later in this course.

- Despite imperfections (in fact, no paper is perfect), AJR (2001) is among the seminal papers in political economy. Many subsequent papers demonstrate the importance of institutions to development.
  - Dell (2010), Acemoglu et al. (2019), Papaioannou and Siourounis (2008), and Banerjee and Iyer (2005), among others

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