FUNDAMENTAL OF GROWTHS

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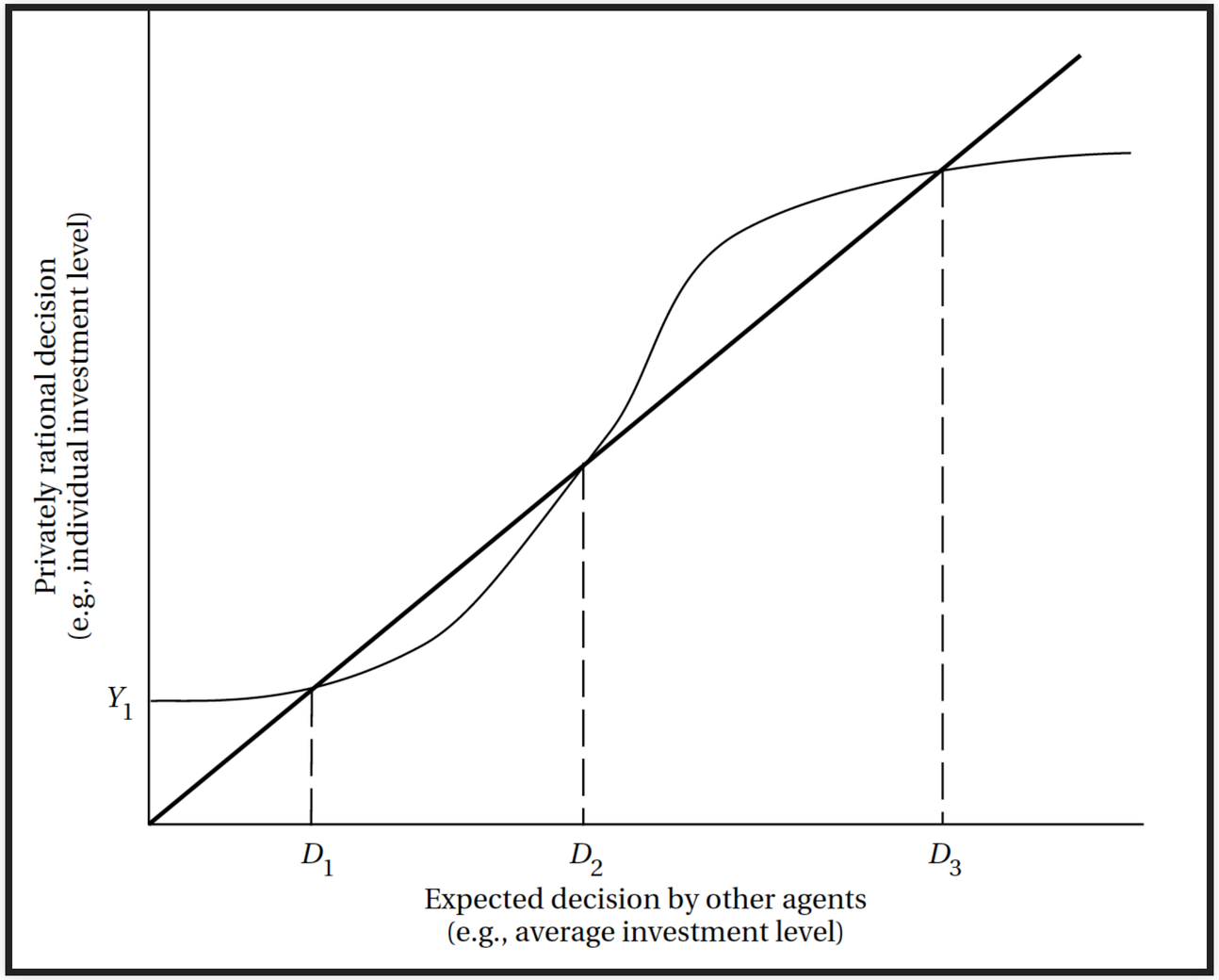
2020

LUCK AND MULTIPLE EQUILIBRIA


Privately rational decision
(e.g., individual investment level)
Y_1
D_1
D_2
D_3
Expected decision by other agents
(e.g., average investment level)

		Everybody else	
		High investment	Low investment
Individual	High investment	y^H, y^H	$y^L - \varepsilon, y^L$
	Low investment	$y^L, y^L - \varepsilon'$	y^L, y^L

Yet, where this luck might come from

DO LEADERS MATTER? NATIONAL LEADERSHIP AND GROWTH SINCE WORLD WAR II

BENJAMIN F. JONES AND BENJAMIN A. OLKEN

How Leaders Leave Power

130 Countries
All Leaders from 1945 or National Independence Date through 2000
Number of Observations, by Type

Lost Election	Term Limits	Voluntary Retirement	Deposed	Death[a]		Other	Total
310	178	131	222	105		225	1184[b]
Assassination		Natural			Accidental		105
28		65			12		
Heart disease	Cancer	Stroke	Other Disease	Surgical complications	Other		
29	12	6	6	3	9		
					Air crash	Other	
					8	4	77

a. There are 21 further cases (not included here) where leaders are killed during a coup.
b. There are 1294 distinct terms in which leaders are in power in the data set, but only 1184 counted in this table, as we do not witness the exit of leaders who are still in power at the end of the year 2000.
c. There are 77 cases of leaders who die in office by natural causes or accidents, but only 57 who die during periods where there is available growth data before and after the leader's death.

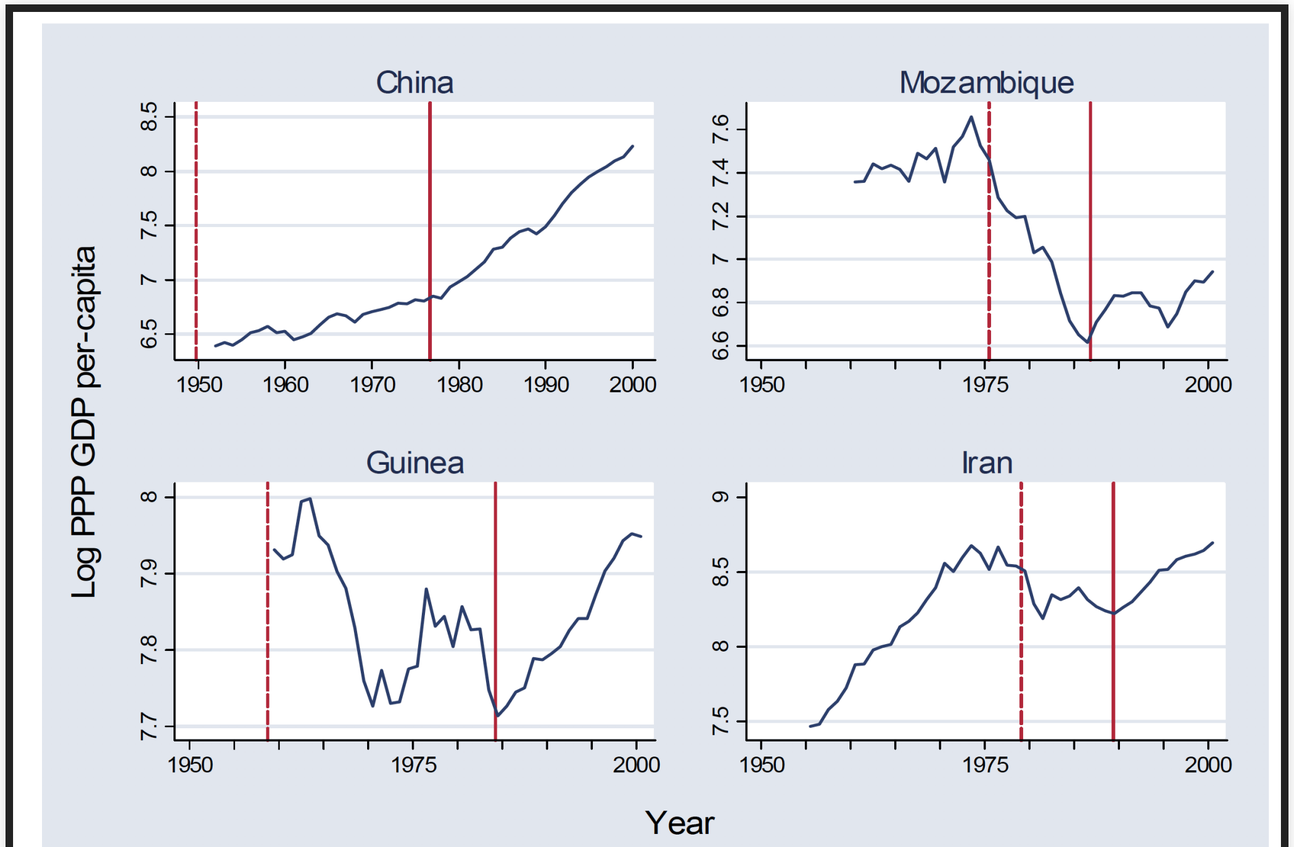


Figure I
Growth and Leader Deaths

Do Leaders Matter?

	All Leaders			Leaders with Tenure >= 2 Years		
	J statistic	Wald P-Value	Rank P-Value	*J* statistic	Wald P-Value	Rank P-Value
Treatment Timings						
t	1.312	.0573*	0.017**	1.392	.0390**	0.004***
t+1	1.272	.0845*	0.075*	1.361	.0537*	0.052*
t+2	1.308	.0669*	0.172	1.443	.0314**	0.121
Control Timings						
t-5	0.841	.7953	0.446	0.918	.6269	0.357
t-6	0.986	.5026	0.806	0.962	.5409	0.905
Number of leaders (t)	57	57	57	47	47	47
Number of observations (t)	5567	5567	5567	5567	5567	5567

Under the null hypothesis, growth is similar before and after randomly-timed leader transitions. P-values indicate the probability that the null hypothesis is true. The *J*-statistic is the test statistic described in equation (3) in the text; under the null, $J = 1$, and higher values of *J* correspond to greater likelihood that the null is false. P-values in columns (2) and (5) are from Chi-squared tests, where the POST and PRE dummies are estimated via OLS allowing for region-specific heteroskedasticity and a region-specific AR(1) process, where the regions are Asia, Latin America, Western Europe, Eastern Europe/Transition, Middle East/North Africa, Sub-Saharan Africa, and Other. Estimation using alternative error structures for the Wald test produce similar or stronger results. Estimation of columns (3) and (6) is via the Rank-method described in the text.
The regressions reported in this table compare 5-year growth averages before and after leader deaths. The treatment timing "t" considers growth in the 5-year period prior to the transition year with growth in the 5-year period after the transition year. The treatment timings "t+1" and "t+2" shift the POST period forward 1 and 2 years respectively. The control timings shift both PRE and POST dummies 5 and 6 years backwards in time. Significance at the 10 percent, 5 percent, and 1 percent level is denoted by *, **, and *** respectively.

Do Economic Variables Predict Leader Deaths?

	(1)	(2)	(3)
Previous Year's			
Growth	1.648		0.902
	(2.254)		(2.306)
Change in Consumption		0.684	
		(1.553)	
Change in Government Expenditure		-0.127	
		(1.109)	
Change in Investment		0.802	
		(0.692)	
Change in Trade		0.075	
		(1.24)	
Change in Terms of Trade			0.814
			(1.110)
Change in Exchange Rate			-3.472**
			(1.431)
Observations	2267	2265	2267

Reported coefficients are from a conditional fixed-effects logit model of the probability of a leader death occurring in a given year, conditional on the number of leader deaths that actually occurred in each country. Results using mean changes in the independent variables over the previous 3 or 5 years, rather than in the previous year, are qualitatively similar. Standard errors are in parentheses. Significance at the 10 percent, 5 percent, and 1 percent level is denoted by *, **, and *** respectively.

Interactions with Type of Political Regime in Year Prior to Death

	J statistic	Wald P-Value	Rank P-Value	*J* statistic	Wald P-Value	Rank P-Value
	Autocrats (Polity IV)			Democrats (Polity IV)		
Treatment Timings						
t	1.621	0.019**	0.040**	1.000	0.460	0.106
t+1	1.672	0.016**	0.017**	0.932	0.552	0.712
t+2	1.592	0.028**	0.051*	1.021	0.432	0.636
Control Timings						
t-5	0.849	0.698	0.837	0.866	0.632	0.075*
t-6	1.094	0.334	0.977	0.647	0.873	0.191
Number of leaders (t)	29	29	29	22	22	22

See notes to Table III. Distinctions across leader sets are defined using the "polity" variable in the Polity IV data set in the year prior to the leader's death. Autocrats are defined by having a polity score less than or equal to 0. Democrats are those leaders with a polity score greater than 0.

What Policies Do Leaders Affect?

	P-values: Probability that dependent variable does not change systematically across randomly-timed leader deaths			
	Inflation	Growth of Government Expenditure	Growth of Trade	Any Conflict
All leaders				
t	0.006***	0.200	0.284	0.715
t+1	0.036**	0.114	0.195	0.589
t+2	0.065*	0.178	0.164	0.482
Autocrats				
t	0.009***	0.356	0.251	0.471
t+1	0.039**	0.492	0.162	0.39
t+2	0.025**	0.300	0.057*	0.303
Democrats				
t	0.186	0.202	0.492	0.789
t+1	0.207	0.088*	0.445	0.717
t+2	0.158	0.327	0.682	0.701
Number of leaders (t)	57	57	57	55

See notes to previous tables. Dependent variables are described in the text.

SOME CAVEATS OF THIS THEORY

- luck and multiple equilibria are useful for our study of the mechanics of economic development, but they are unlikely to provide us with the fundamental causes of why world economic growth started 200 years ago and why some countries are rich while others are poor today.

GEOGRAPHY AND GROWTH

GEOGRAPHY AND ECONOMIC DEVELOPMENT

John Luke Gallup and Jeffrey D. Sachs, with Andrew Mellinger

March 1999

We find that location and climate have large effects on income levels and income growth, through their effects on transport costs, disease burdens, and agricultural productivity, among other channels. Furthermore, geography seems to be a factor in the choice of economic policy itself.

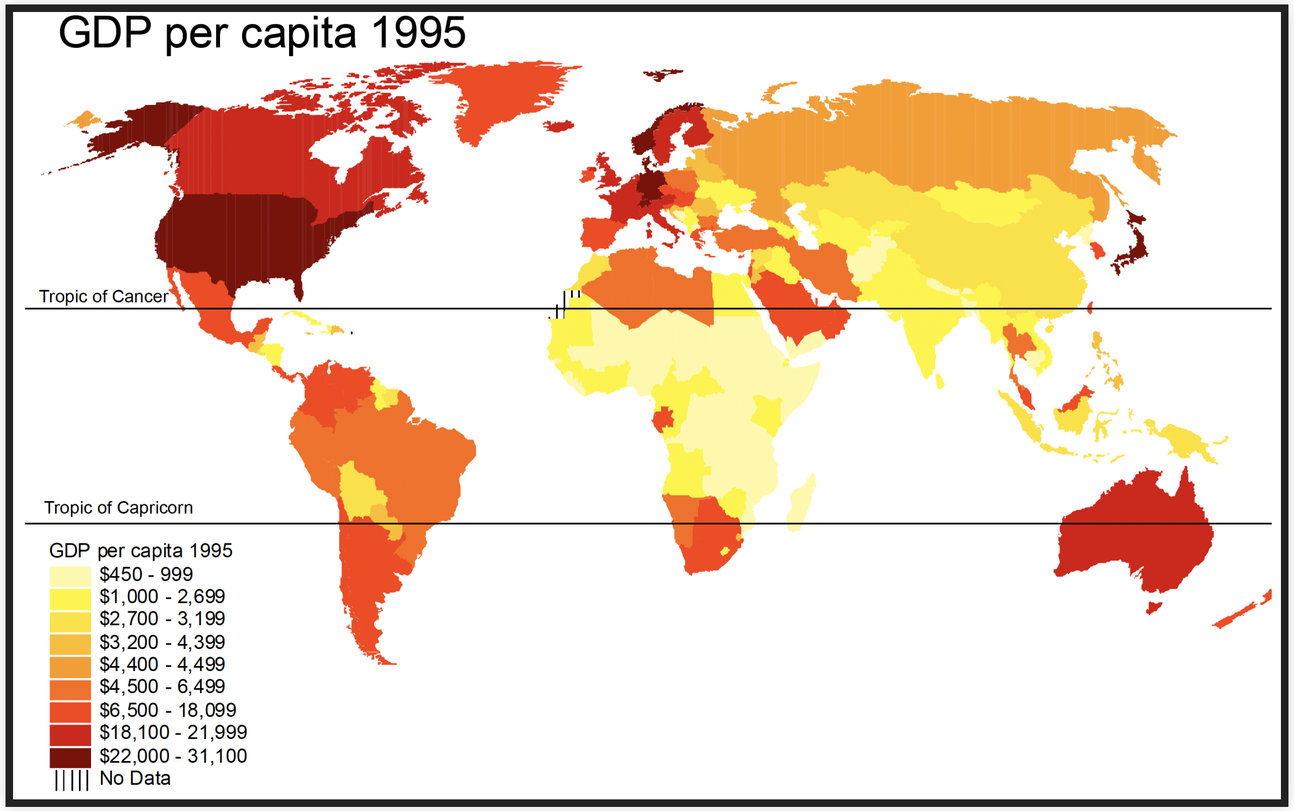

GDP per capita 1995
Tropic of Cancer
Tropic of Capricorn
GDP per capita 1995
$450 - 999
$1,000 - 2,699
$2,700 - 3,199
$3,200 - 4,399
$4,400 - 4,499
$4,500 - 6,499
$6,500 - 18,099
$18,100 - 21,999
$22,000 - 31,100
No Data

Table 2. Level of GDP

	(1) lgdp50	(2) lgdp90	(3) lgdp95	(4) lgdp95	(5) lgdp95 (non-Africa)	(6) lgdp95
Tropical Area (%)	-0.69	-0.99	-0.99			
	(4.13)	(5.78)	(5.10)			
Pop 100 km (%)	0.71	1.00	1.09	0.85	1.21	0.36
	(4.02)	(5.43)	(5.27)	(3.63)	(4.17)	(2.53)
LDistance	-0.22	-0.39	-0.34			0.03
	(2.56)	(4.39)	(3.41)			(0.55)
Shipping Cost (CIF/FOB)				-2.28	-13.50	
				(2.32)	(4.66)	
Malaria index 1994 (0-1)				-1.55	-1.26	-1.15
				(6.60)	(2.69)	(7.65)
Log hydrocarbons per person				0.01	0.01	0.01
				(1.84)	(1.75)	(1.85)
Socialism						-0.05
						(0.31)
New State (0-3)						-0.06
						(0.98)
Trade Openness (0-1)						0.23
						(7.38)
Public Institutions (0-10)						0.55
						(3.17)
Constant	9.07	11.19	10.98	10.84	22.64	6.71
	(13.58)	(16.26)	(14.10)	(9.82)	(7.42)	(11.06)
Observations	129	129	129	83	52	97
R^2	0.38	0.58	0.50	0.69	0.56	0.88

Absolute value of *t*-statistics in parentheses

Table 3. GDP Growth

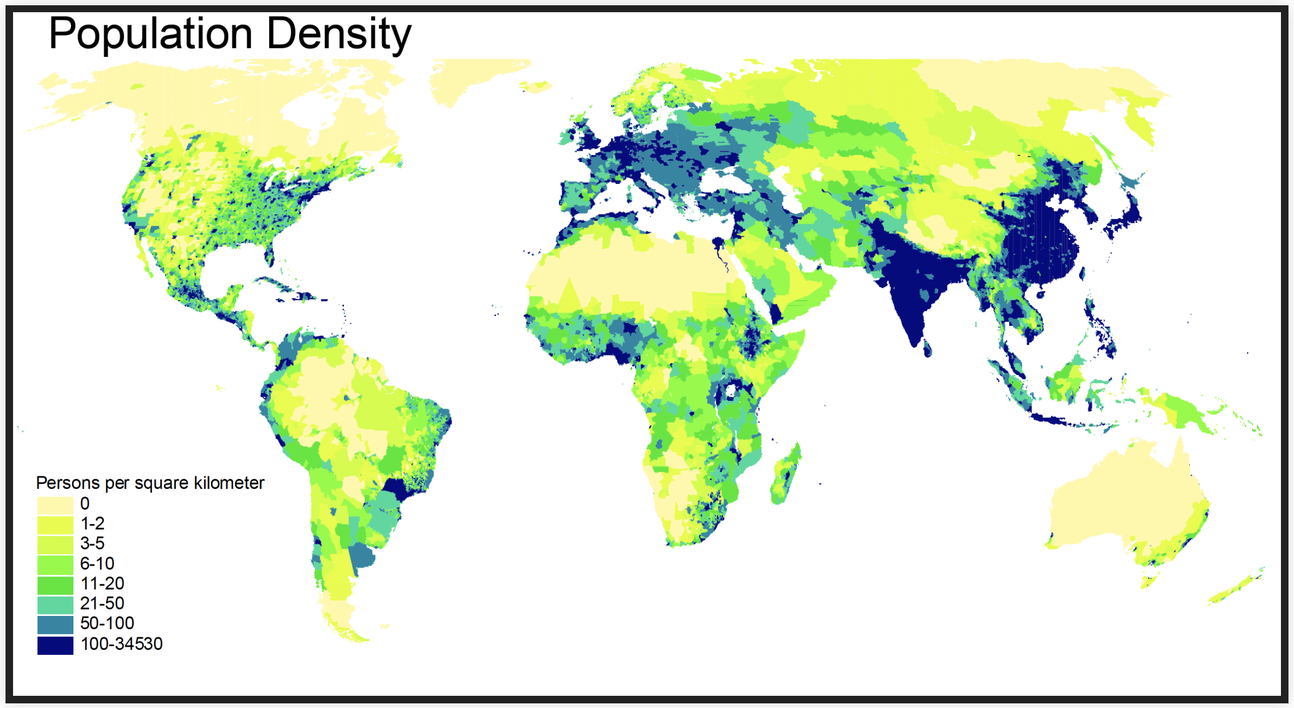
	(1) gr6590	(2) gr6590	(3) gr6590	(4) gr6590	(5) gr6590 (TSLS)	(6) gr6590	(7) gr6590
GDP p.c. 1965	-2.3	-2.4	-2.5	-2.6	-2.7	-2.3	-2.4
	(7.70)	(8.02)	(8.06)	(7.87)	(7.60)	(7.41)	(7.09)
Years of secondary schooling	0.3	0.2	0.2	0.2	0.2	0.1	0.1
	(1.75)	(1.77)	(1.32)	(1.34)	(1.15)	(0.81)	(0.89)
Log life expectancy 1965	6.6	5.5	4.3	3.3	2.4	4.1	3.4
	(7.23)	(6.21)	(4.45)	(3.60)	(1.79)	(4.53)	(3.89)
Trade Openness 1965-90 (0-1)	1.9	1.9	1.7	1.7	1.7	1.8	1.8
	(5.49)	(4.79)	(4.79)	(4.70)	(4.39)	(4.79)	(4.66)
Public Institutions (0-10)	0.3	0.3	0.3	0.4	0.5	0.3	0.4
	(3.08)	(2.63)	(3.32)	(3.92)	(3.66)	(3.20)	(3.47)
LDistance		0.0					
		(0.24)					
Pop100km (%)		1.0	0.9	0.8	0.6		
		(3.07)	(3.01)	(2.64)	(1.91)		
Tropical area (%)		-0.9	-0.6	-0.5	-0.4	-0.7	-0.5
		(2.28)	(1.35)	(1.09)	(0.82)	(1.89)	(1.44)
Malaria index 1966			-1.2	-2.0	-2.6	-0.9	-1.6
			(2.15)	(3.60)	(3.87)	(1.86)	(2.89)
dMal6694				-2.5	-4.5		-1.9
				(3.93)	(2.12)		(2.94)
Log coastal density						0.3	0.2
						(4.91)	(4.34)
Log inland density						-0.1	-0.1
						(2.26)	(1.60)
Constant	-8.9	-4.1	1.3	5.9	9.8	0.7	4.1
	(2.90)	(1.17)	(0.34)	(1.57)	(1.76)	(0.19)	(1.08)
Observations	75	75	75	75	75	75	75
R^2	0.71	0.75	0.77	0.80	0.78	0.80	0.82

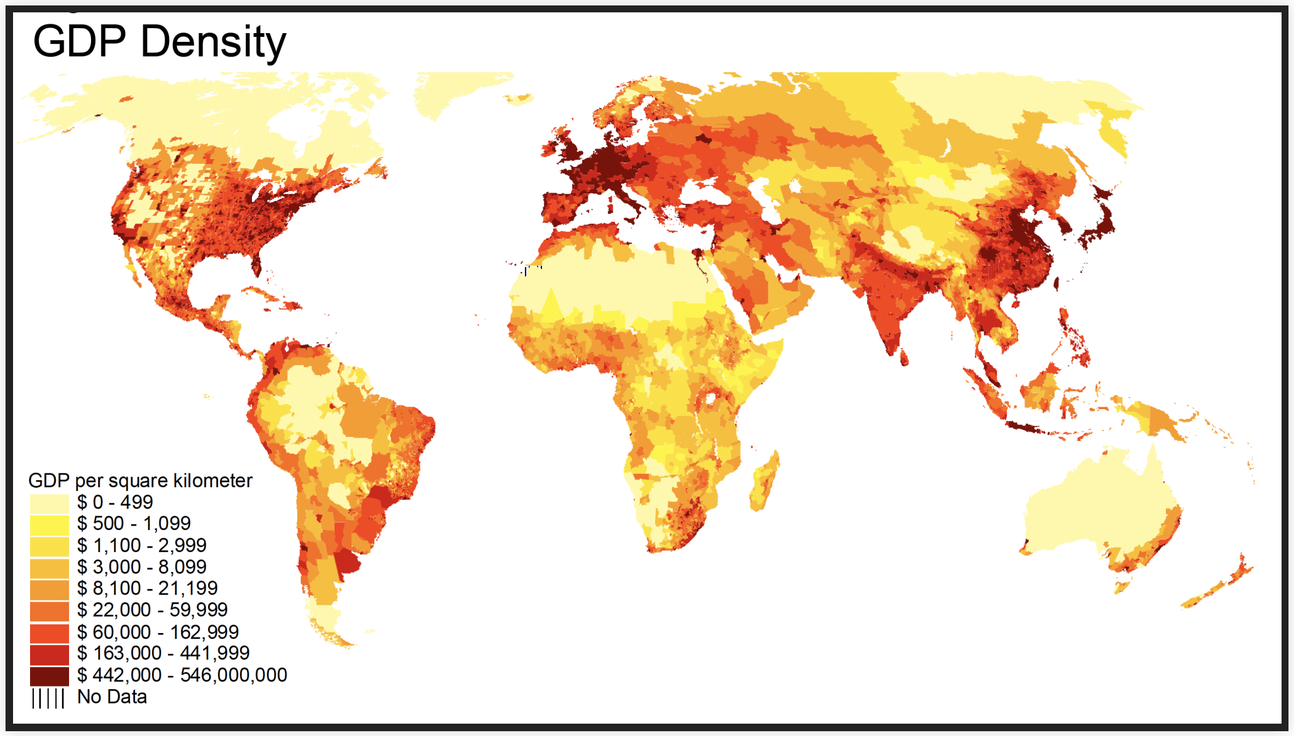
Absolute value of robust *t*-statistics in parentheses

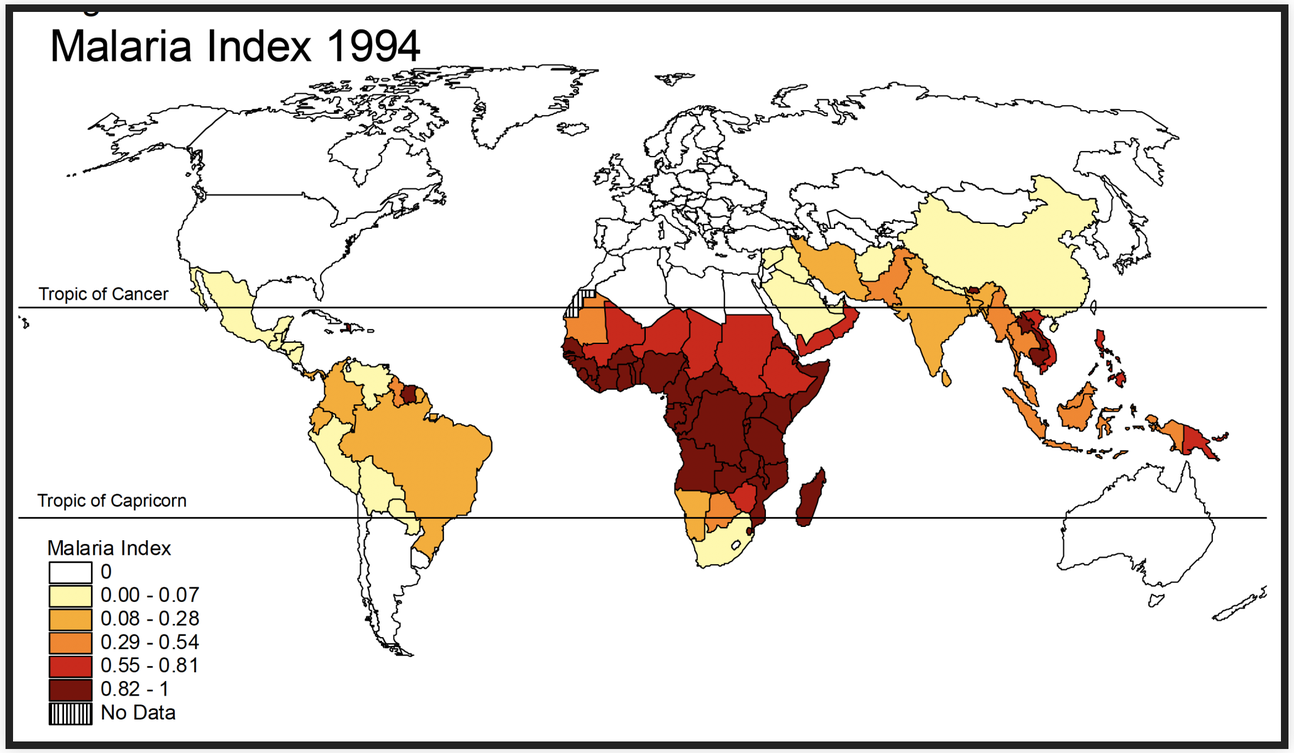
Table 5. Growth Rates in Selected Regions Compared with East Asia

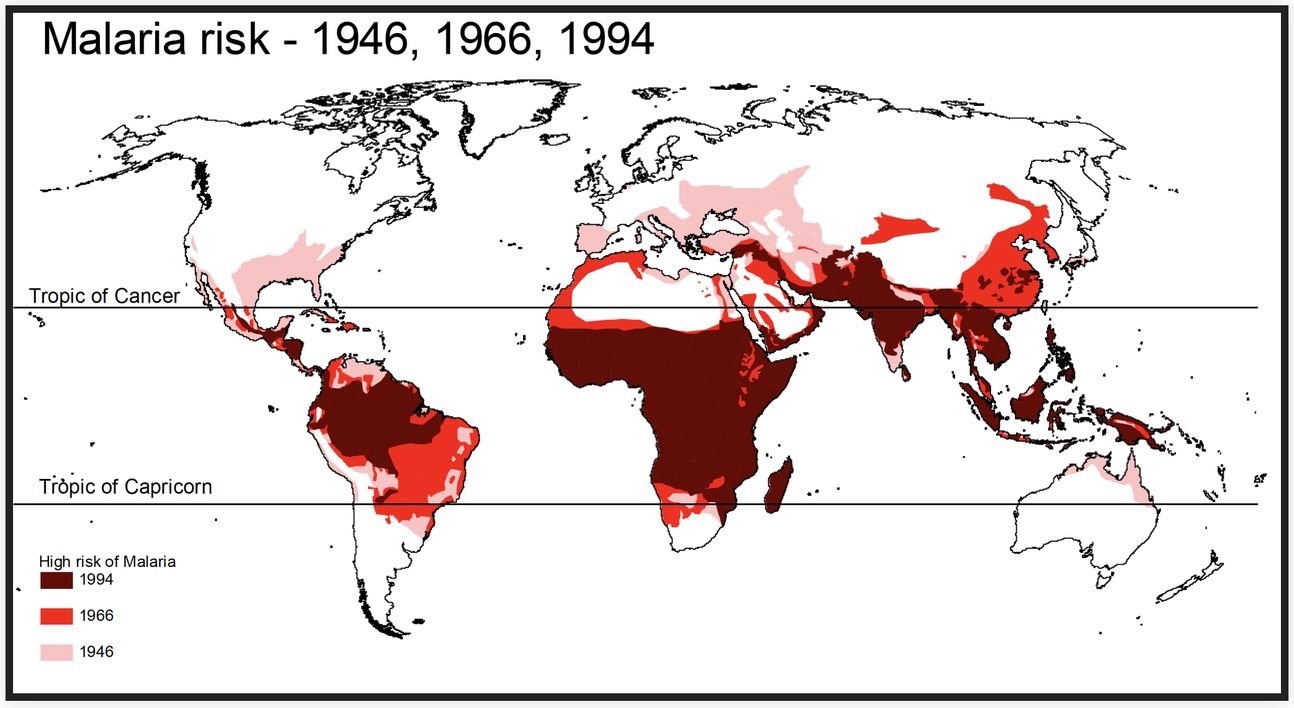
		Sub-Saharan Africa-East Asia	South Asia-East Asia	Latin America-East Asia
Growth		-4.2	-2.8	-3.6
Explained		-3.7	-2.0	-3.0
Initial GDP		1.4	1.0	-1.1
Geography and Health	Total	-3.0	-0.8	-0.2
	Coastal density	-0.7	0.0	-0.5
	Interior density	0.0	-0.3	0.1
	Tropics	-0.1	0.1	-0.1
	Malaria	-1.0	-0.1	0.3
	Life expectancy	-1.2	-0.5	0.0
Policy and Education	Total	-2.1	-2.1	-1.8
	Openness	-1.2	-1.2	-1.0
	Public institutions	-0.7	-0.9	-0.7
	Secondary education	-0.2	-0.1	0.0
Residual		-0.5	-0.8	-0.6

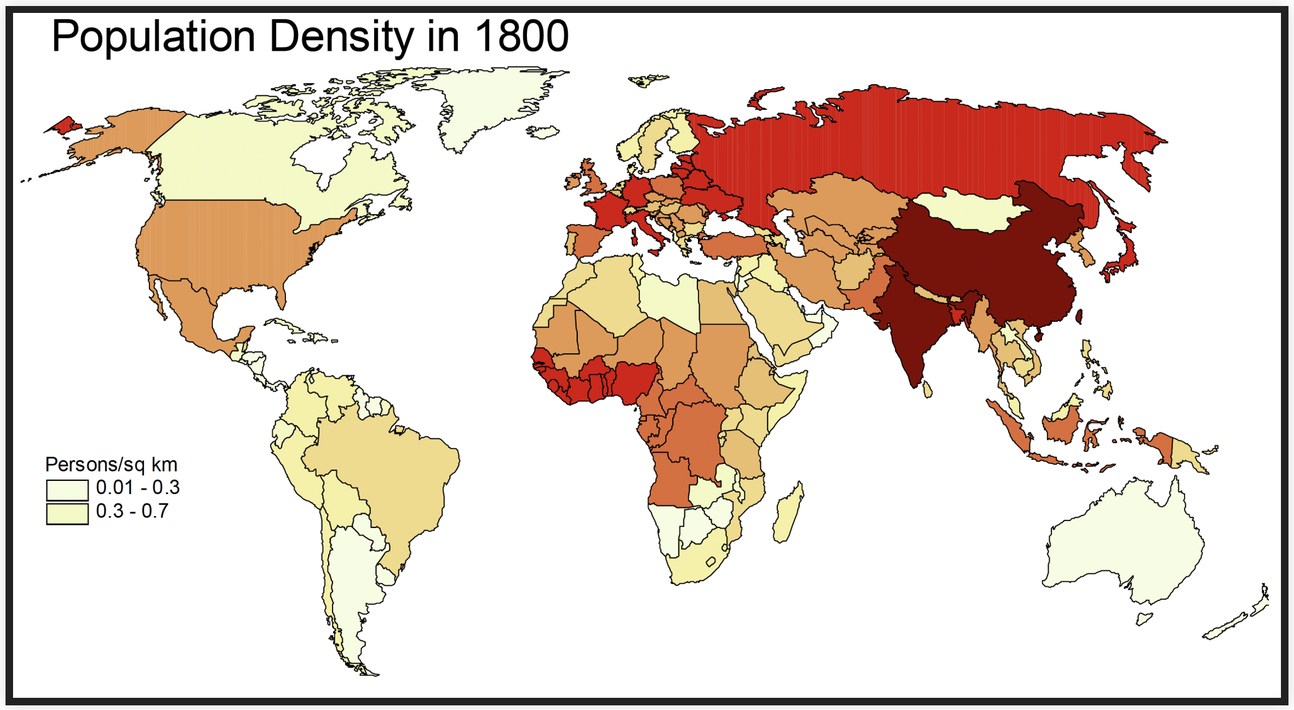
WHAT ARE THE MAIN MECHANISMS?


Population Density
Persons per square kilometer
0
1-2
3-5
6-10
11-20
21-50
50-100
100-34530

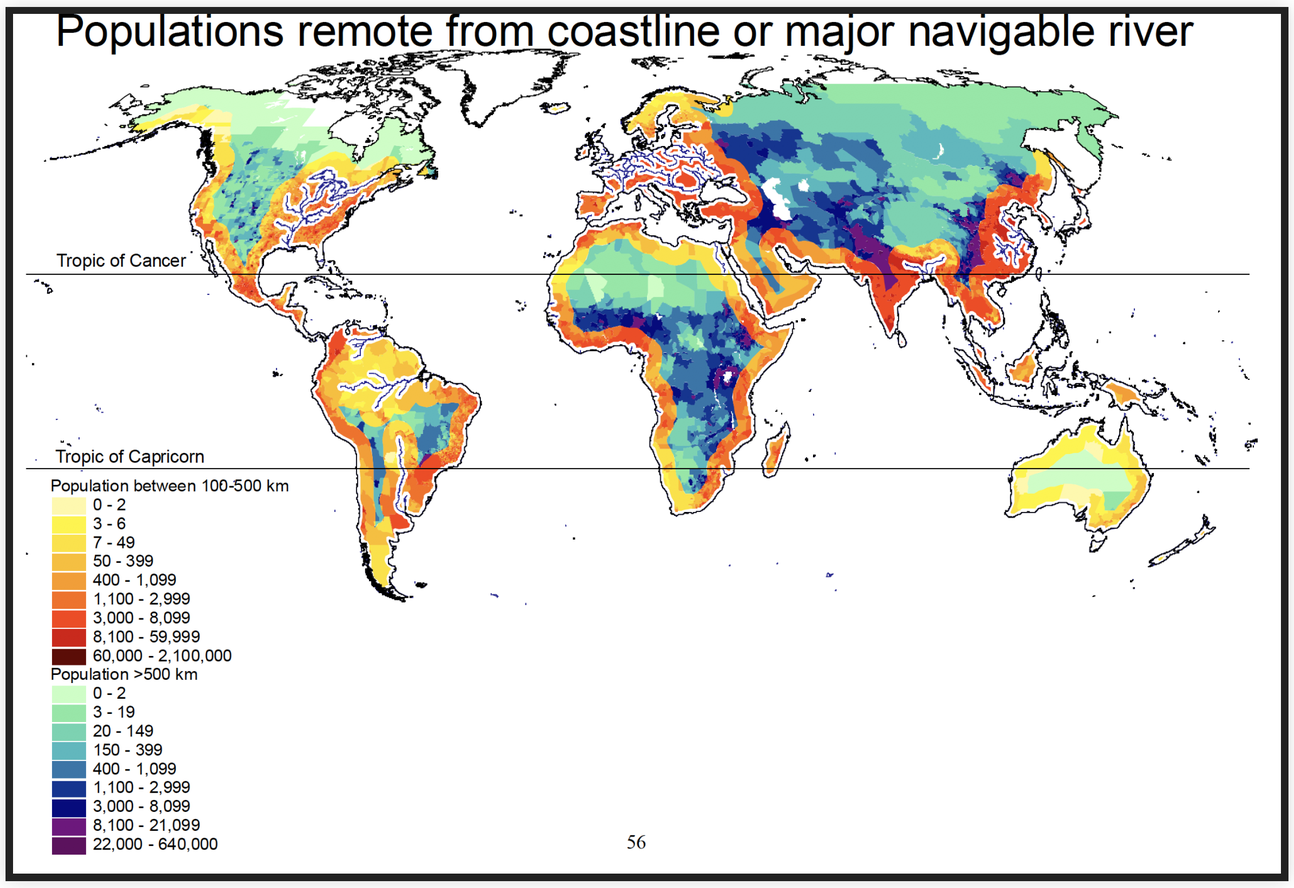

GDP Density
GDP per square kilometer
$ 0 - 499
$ 500 - 1,099
$ 1,100 - 2,999
$ 3,000 - 8,099
$ 8,100 - 21,199
$ 22,000 - 59,999
$ 60,000 - 162,999
$ 163,000 - 441,999
$ 442,000 - 546,000,000
No Data


Malaria Index 1994
Tropic of Cancer
Tropic of Capricorn
Malaria Index
0
0.00 - 0.07
0.08 - 0.28
0.29 - 0.54
0.55 - 0.81
0.82 - 1
No Data


Malaria risk - 1946, 1966, 1994
Tropic of Cancer
Tropic of Capricorn
High risk of Malaria
1994
1966
1946


Population Density in 1800
Persons/sq km
0.01 - 0.3
0.3 - 0.7

Populations remote from coastline or major navigable river



SOME CAVEATS OF THIS THEORY

- Most of the technological differences emphasized by these authors refer to agriculture.
- What about industrialization?
- Poverty and Diseases -

CULTURE

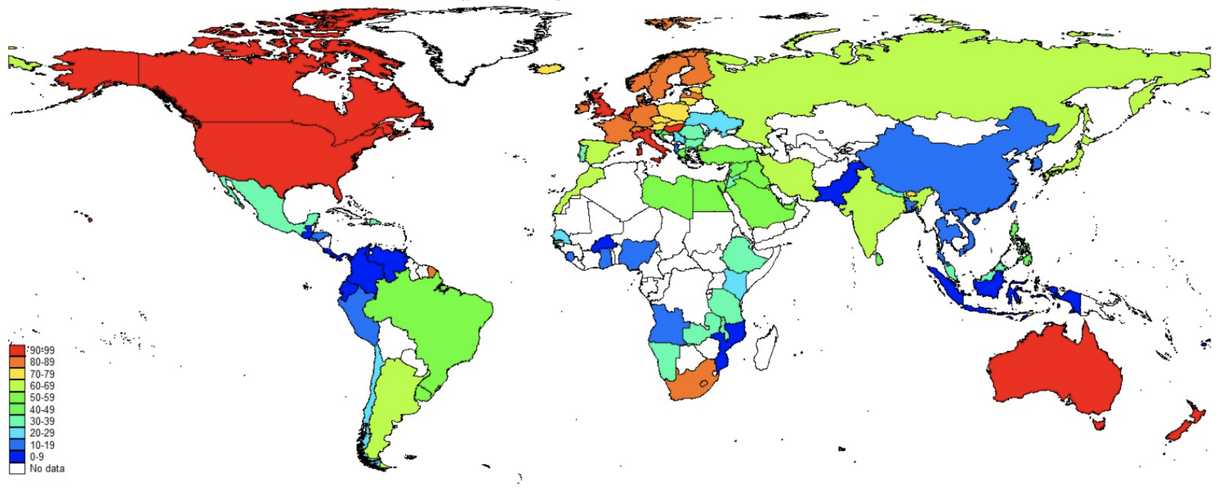
- Religion
- Values
- Cooperation

CULTURE, INSTITUTIONS AND THE WEALTH OF NATIONS

Yuriy Gorodnichenko Gerard Roland

They argue that a more individualist culture leads to more innovation and to higher growth because of the social status rewards associated with innovation in that culture.

Figure 1. Map of individualism scores.



Source: Hofstede (2001).

Table 1. Income and individualism.

		Instrumental variables						
	OLS	Blood distance from the UK	Frequency of short (S) allele in the polymorphic region 5HTTLPR of serotonin transporter gene (SLC6A4)		Frequency of G allele in polymorphism A118G in μ-opoid receptor gene		Historical pathogen prevalence index	
			Separate	Combined with blood distance	Separate	Combined with blood distance	Separate	Combined with blood distance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Second stage: regression of log income per worker on individualism							
Individualism	0.030***	0.046***	0.020**	0.034***	0.020***	0.026***	0.043***	0.039***
	(0.003)	(0.007)	(0.010)	(0.008)	(0.006)	(0.006)	(0.006)	(0.005)
	First stage: regression of individualism on IV							
Alternative IV			-1.027***	-0.445	-1.494***	-0.690	-23.038***	-17.535***
			(0.223)	(0.300)	(0.312)	(0.480)	(2.238)	(2.239)
Blood distance		-15.929***		-13.051*		-13.452***		-8.461***
		(2.373)		(4.560)		(5.213)		(2.481)
Observations	96	96	43	43	34	34	96	96
R^2	0.377	0.277	0.471	0.336	0.507	0.540	0.178	0.215
1st stage F-stat		45.04	22.46	21.77	22.97	25.56	116.1	66.53
Over-id test p-value				0.110		0.250		0.410

Notes: The dependent variable in the second stage is log income (at purchasing power parity) per worker in 2000 from the Penn World Tables. *Individualism* is Hofstede's index of individualism. The instrument in column (2) is the Mahalanobis distance of frequency of blood types A and B in a given country relative to the frequency of blood types A and B in the UK. The instrument in columns (3) and (4) is from Chiao and Blizinsky (2010) and Inglehart et al. (2014), in columns (5) and (6) from Way and Lieberman (2010) and additional sources (see Appendix F) in columns (7) and (8) from Murray and Schaller (2010). In columns (3), (5), and (7) the set of instrumental variables does not include blood distance from the U.K. In columns (4), (6), and (8) the set of instrumental variables includes the blood distance from the UK and an alternative instrumental variable shown in the heading of the column. *Over-id test p-value* reports the p-value for the overidentifying restriction tests that instruments are correctly excluded. Specifications in columns (1)-(6) do not include controls. Specifications (3)-(4) exclude Trinidad and Tobago which is identified as an outlier in the first stage regression. Specifications (5)-(6) exclude Nigeria which is identified as an outlier in the first stage regression. Robust standard errors are in parentheses. ***, **, * denote significance at 0.01, 0.05, and 0.10 levels.

Table 4. Income and individualism by region.

	Asia	Europe	Africa	America	Africa Asia Europe	Africa Asia	OECD	non-OECD
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: OLS				
Individualism	0.040**	0.025***	0.039**	0.018***	0.030***	0.040***	0.016***	0.027***
	(0.015)	(0.005)	(0.015)	(0.003)	(0.005)	(0.010)	(0.005)	(0.007)
Observations	22	34	18	19	74	40	30	66
R-squared	0.227	0.444	0.306	0.465	0.639	0.490	0.295	0.478
				Panel B: IV				
Individualism	0.050**	0.061**	0.098**	0.024***	0.063***	0.065***	0.040***	0.058***
	(0.025)	(0.025)	(0.046)	(0.007)	(0.017)	(0.024)	(0.014)	(0.022)
Observations	22	34	18	19	74	40	30	66
R-squared	0.214	-0.471	-0.358	0.413	0.439	0.420	-0.354	0.300
1st stage F-stat	4.879	4.649	4.815	8.448	11.46	8.171	8.409	8.004
Partial R2	0.262	0.131	0.179	0.335	0.150	0.204	0.267	0.118

Notes: the dependent variable is log income (at purchasing power parity) per worker in 2000 from the Penn World Tables. *Individualism* is Hofstede's index of individualism. A larger value of the index corresponds to a greater level of individualism. The instrument is the Mahalanobis distance of frequency of blood types A and B in a given country relative to the frequency of blood types A and B in the UK. The specification in columns (1)-(4) does not include controls. The specification in columns (5)-(8) includes continent dummies. Robust standard errors in parentheses. ***, **, * denote significance at 0.01, 0.05, and 0.10 levels.

RELIGION AND ECONOMIC GROWTH

Robert J. Barro Rachel M. McCleary

Figure 1
Church Attendance versus GDP
(simple relation)

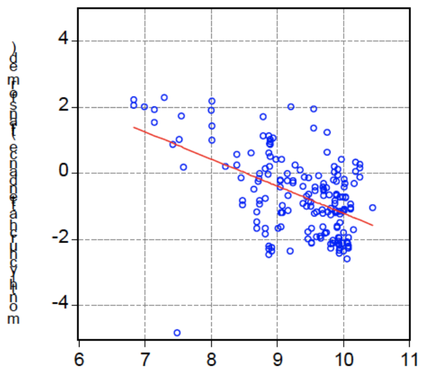


Figure 2
Belief in Heaven versus GDP
(simple relation)

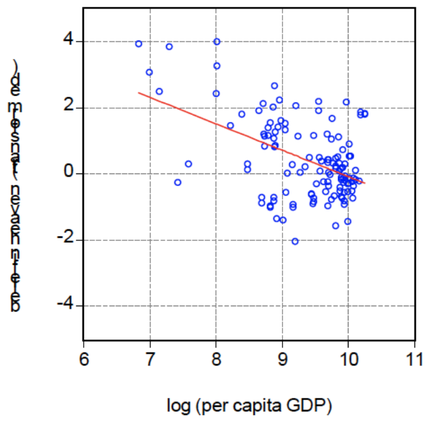


Figure 3
Belief in Hell versus GDP
(simple relation)

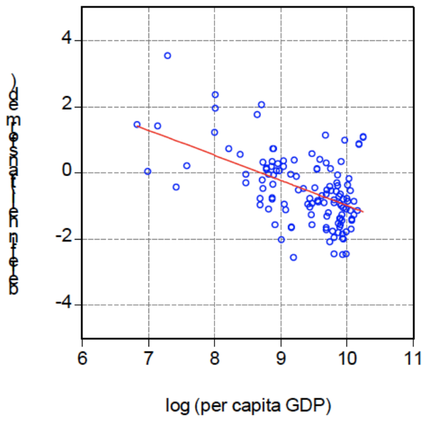


Figure 4
Economic Growth and Church Attendance
(belief in hell included)

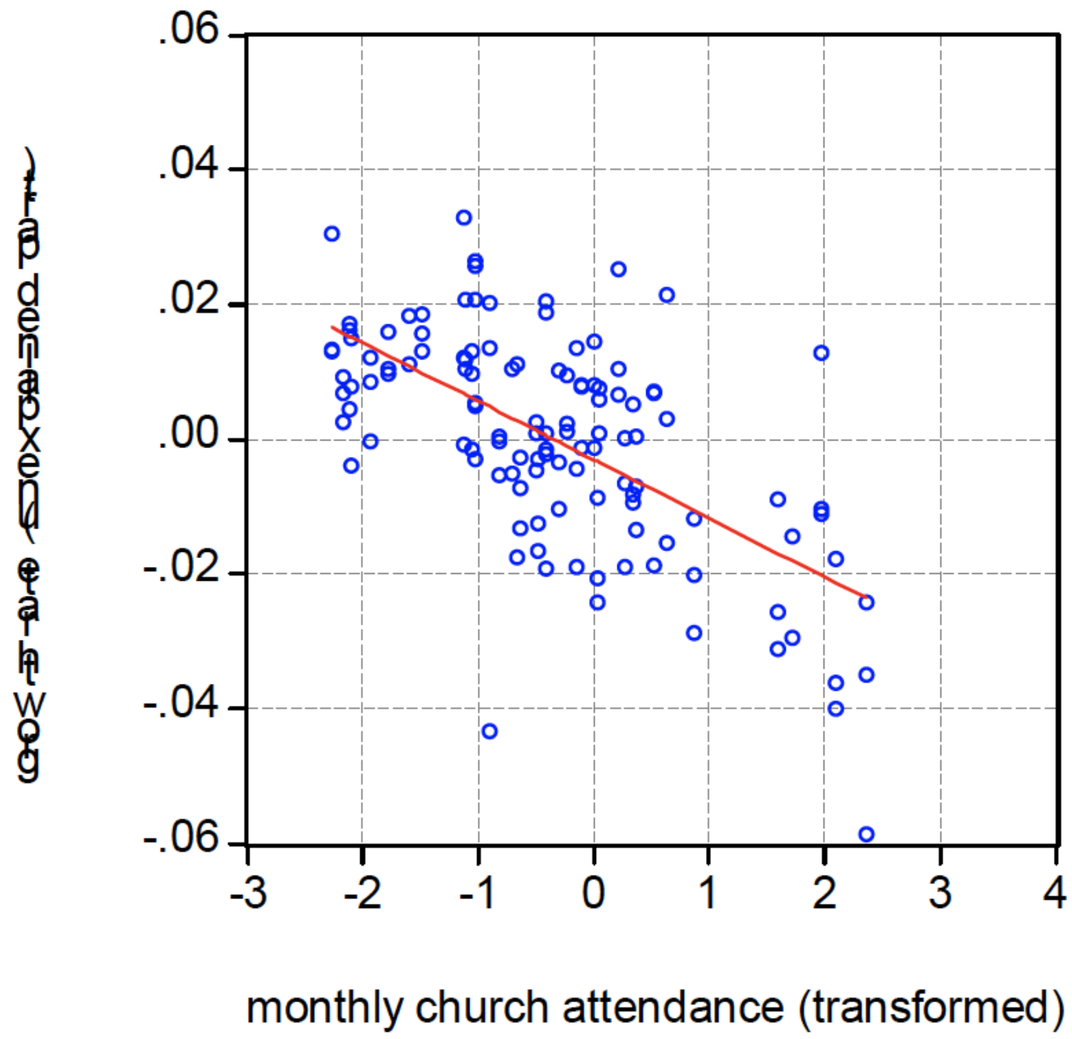


Figure 5
Economic Growth and Belief in Hell

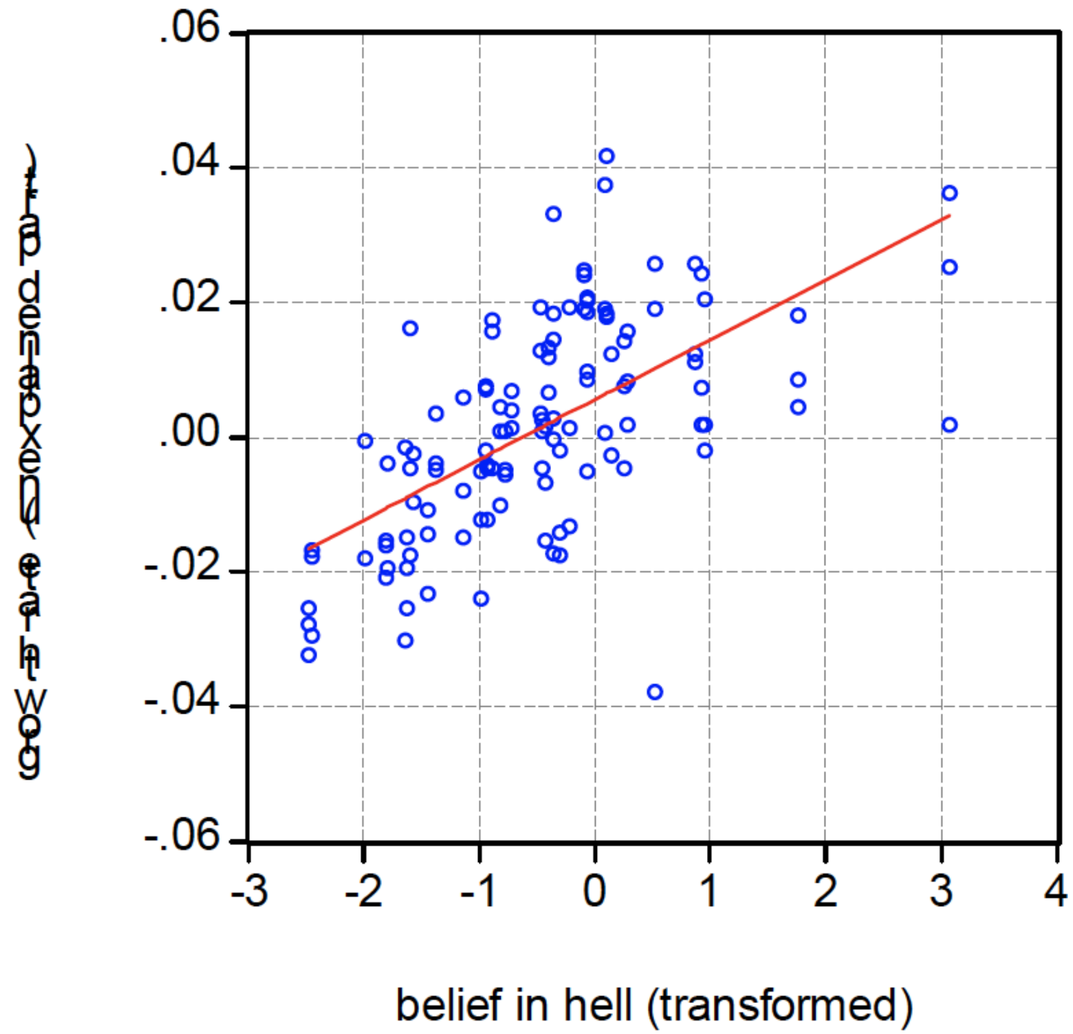
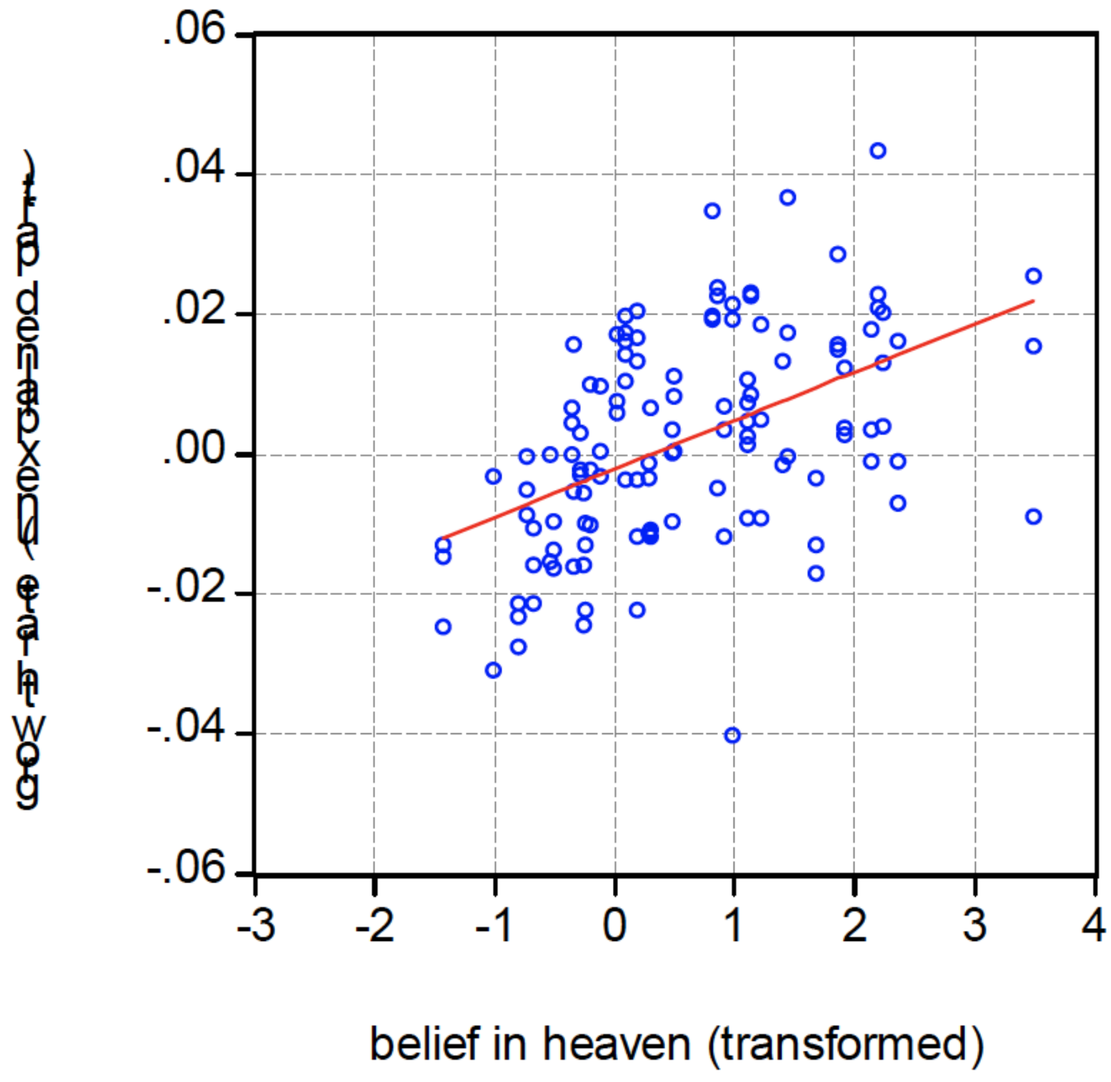


Figure 7
Growth Rate and Belief in Heaven



Any conclusion?

INSTITUTIONS

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

North (1990, p. 3)

- they are humanly devised; that is, in contrast to geography, which is outside human control, institutions refer to man-made factors.
- institutions place constraints on individual behavior
- The constraints placed on individuals by institutions shape human n and affect incentives.

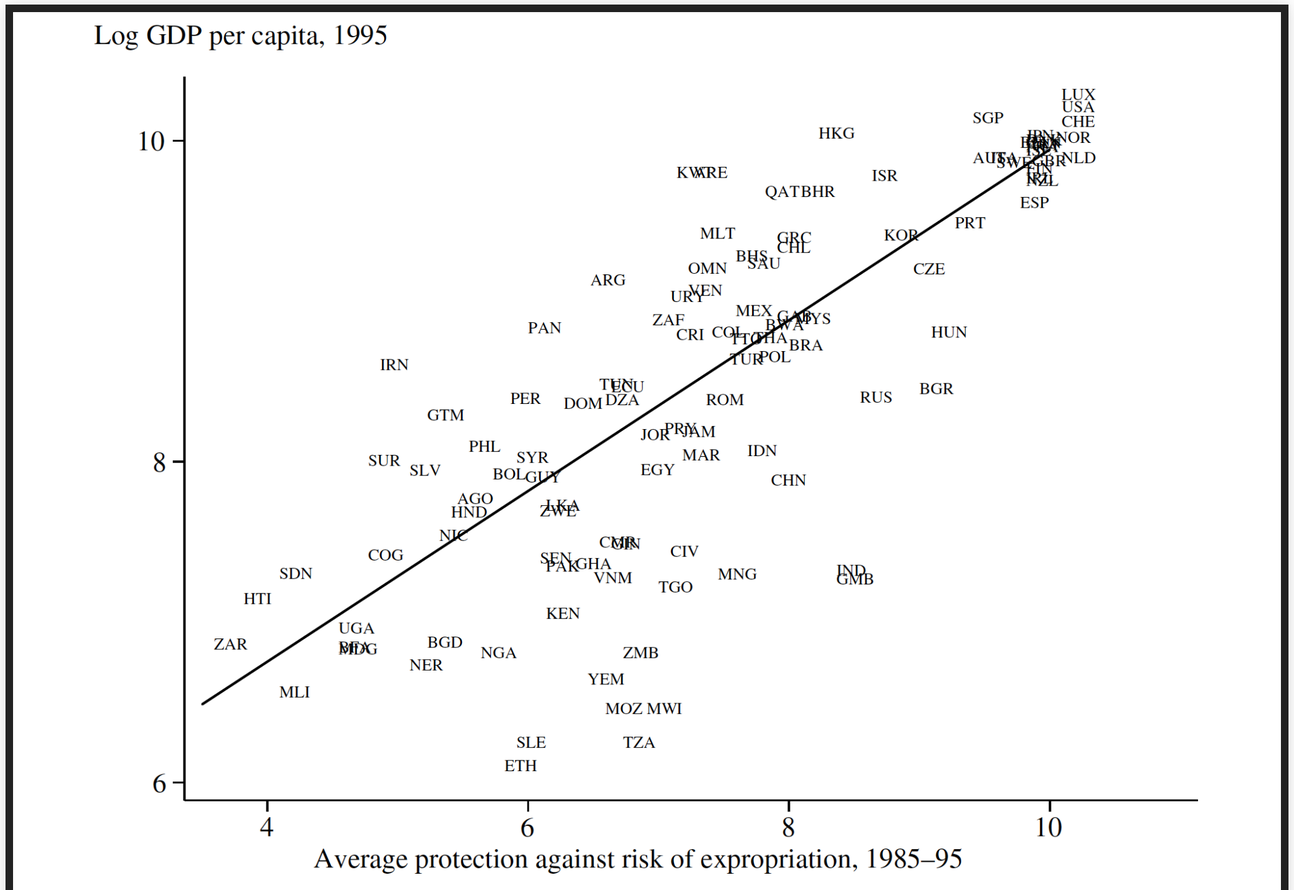


FIGURE 4.1 Relationship between economic institutions, as measured by average expropriation risk between 1985 and 1995, and GDP per capita.

THE COLONIAL ORIGINS OF COMPARATIVE DEVELOPMENT: AN EMPIRICAL INVESTIGATION”

DARON ACEMOGLU, SIMON JOHNSON AND JAMES ROBINSON

- Settler mortality affected colonialization strategy, which affected institutions.
- These institutional differences have persisted.
- In a sample of former colonies, regress income per capital today on institutions today, instrumenting with settler mortality.
- “This identification strategy will be valid as long as … mortality rates of settlers between the seventeenth and nineteenth centuries have no effect on income today other than through their influence on institutional development” (AJR, p. 1383).

- Mortality influenced settlement patterns.
- Colonizers adopted very different strategies in different places: “settler colonies” vs. “extractive states.”

(Potential) settler mortality ⇒ Settlements ⇒ Early institutions ⇒ Current institutions ⇒ Current 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.

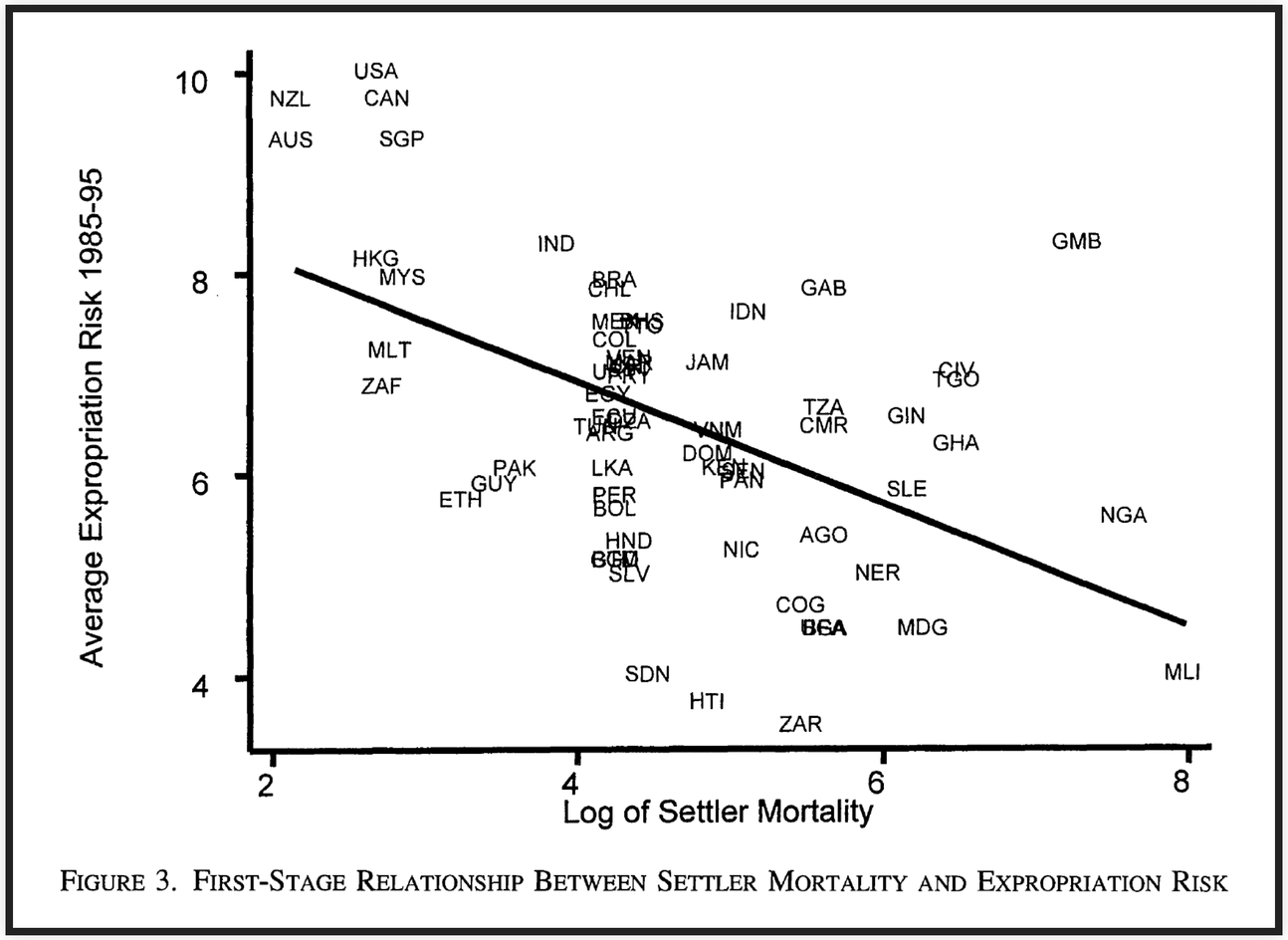


FIGURE 3. FIRST-STAGE RELATIONSHIP BETWEEN SETTLER MORTALITY AND EXPROPRIATION RISK

TABLE 3—DETERMINANTS OF INSTITUTIONS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A	Dependent Variable Is Average Protection Against Expropriation Risk in 1985–1995									
Constraint on executive in 1900	0.32	0.26								
	(0.08)	(0.09)								
Democracy in 1900			0.24	0.21						
			(0.06)	(0.07)						
Constraint on executive in first year of independence					0.25	0.22				
					(0.08)	(0.08)				
European settlements in 1900							3.20	3.00		
							(0.61)	(0.78)		
Log European settler mortality									−0.61	−0.51
									(0.13)	(0.14)
Latitude		2.20		1.60		2.70		0.58		2.00
		(1.40)		(1.50)		(1.40)		(1.51)		(1.34)
R^2	0.2	0.23	0.24	0.25	0.19	0.24	0.3	0.3	0.27	0.3
Number of observations	63	63	62	62	63	63	66	66	64	64

Panel B	Dependent Variable Is Constraint on Executive in 1900				Dependent Variable Is Democracy in 1900				Dependent Variable Is European Settlements in 1900	
European settlements in 1900	5.50	5.40			8.60	8.10				
	(0.73)	(0.93)			(0.90)	(1.20)				
Log European settler mortality			−0.82	−0.65			−1.22	−0.88	−0.11	−0.07
			(0.17)	(0.18)			(0.24)	(0.25)	(0.02)	(0.02)
Latitude		0.33		3.60		1.60		7.60		0.87
		(1.80)		(1.70)		(2.30)		(2.40)		(0.19)
R^2	0.46	0.46	0.25	0.29	0.57	0.57	0.28	0.37	0.31	0.47
Number of observations	70	70	75	75	67	67	68	68	73	73

Notes: All regressions are OLS. Standard errors are in parentheses. Regressions with constraint on executive in first year of independence also include years since independence as a regressor. Average protection against expropriation risk is on a scale from 0 to 10, where a higher score means more protection against expropriation of private investment by government, averaged over 1985 to 1995. Constraint on executive in 1900 is on a scale from 1 to 7, with a higher score indicating more constraints. Democracy in 1900 is on a scale from 0 to 10, with a higher score indicating more democracy. European settlements is percent of population that was European or of European descent in 1900. See Appendix Table A1 for more detailed variable definitions and sources.

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

Notes: The dependent variable in columns (1)–(8) is log GDP per capita in 1995, PPP basis. The dependent variable in column (9) is log output per worker, from Hall and Jones (1999). "Average protection against expropriation risk 1985–1995" is measured on a scale from 0 to 10, where a higher score means more protection against risk of expropriation of investment by the government, from Political Risk Services. Panel A reports the two-stage least-squares estimates, instrumenting for protection against expropriation risk using log settler mortality; Panel B reports the corresponding first stage. Panel C reports the coefficient from an OLS regression of the dependent variable against average protection against expropriation risk. Standard errors are in parentheses. In regressions with continent dummies, the dummy for America is omitted. See Appendix Table A1 for more detailed variable descriptions and sources.

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 1985–1995									
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

Notes: Panel A reports the two-stage least-squares estimates with log GDP per capita (PPP basis) in 1995 as dependent variable, and Panel B reports the corresponding first stage. The base case in columns (1) and (2) is all colonies that were neither French nor British. The religion variables are included in the first stage of columns (7) and (8) but not reported here (to save space). Panel C reports the OLS coefficient from regressing log GDP per capita on average protection against expropriation risk, with the other control variables indicated in that column (full results not reported to save space). Standard errors are in parentheses and *p*-values for joint significance tests are in brackets. The religion variables are percentage of population that are Catholics, Muslims, and "other" religions; Protestant is the base case. Our sample is all either French or British legal origin (as defined by La Porta et al., 1999).

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.

NATIONAL INSTITUTIONS AND SUBNATIONAL DEVELOPMENT IN AFRICA

Michalopoulos and Papaioannow. The Quarterly Journal of Economics (2014) 129 (1): 151-213.

PAPER

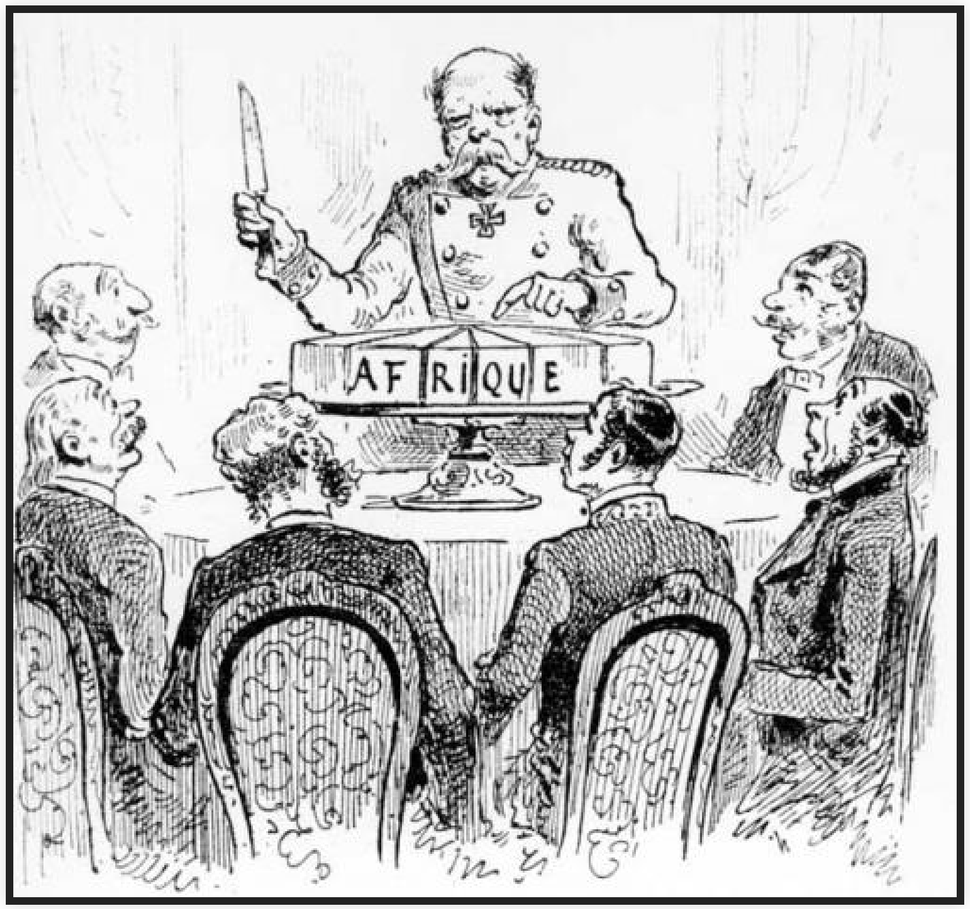
They investigate the role of national institutions on subnational African development in a novel framework that accounts for both local geography and cultural-genetic traits.

- political boundaries → partitioned more than 200 ethnic groups

METHOD

- Matching type
- Spatial Regression Discontinuity approach (pixel level)

BERLIN CONFERENCE: PARTITIONED AFRICA AMONG COLONIZERS



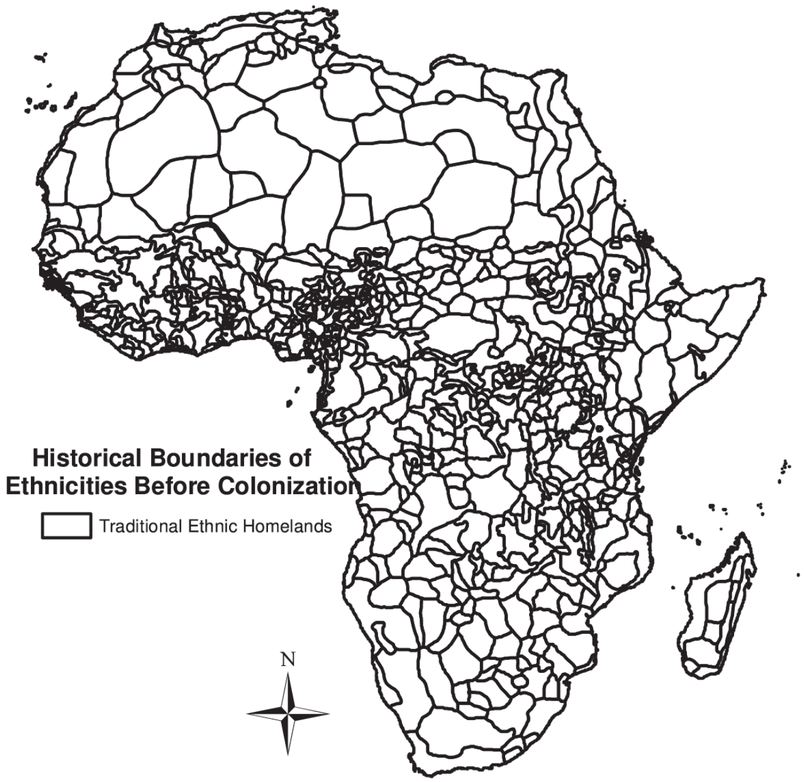


FIGURE IA

Ethnic Boundaries

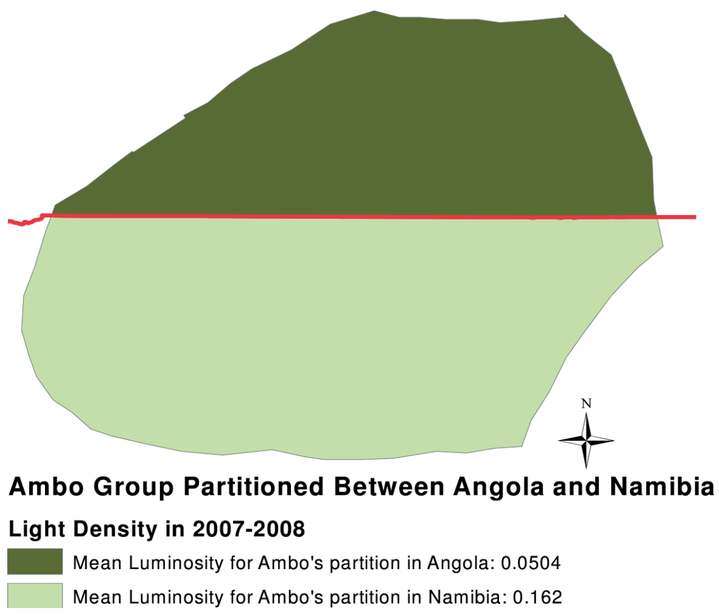


FIGURE IIA

Example: Unit of Analysis I

DEFINING PARTITIONED

- At least 10% of the historical homeland belongs to more than one contemporary state.
- They drop partitioned areas of less than 100 square kilometers as tiny partitions are most likely due to the lack of precision and projection error.

(1) $$y_{i,c} = a_0 + \gamma IQL_c + \lambda_1 PD_{i,c} + \lambda_2 AREA_{i,c} + X'_{i,c}\Phi + a_i + \varepsilon_{i,c}.$$

The dependent variable, $y_{i,c}$, reflects the level of economic activity in the historical homeland of ethnic group i in country c, as proxied by light density. Because a significant fraction (around 30%) of the (country-ethnicity) observations takes on the value of zero, we use as dependent variable the log of light density, adding a small number ($y_{i,c} \equiv \ln(0.01 + LightDensity_{i,c})$).[5] The logarithmic transformation is useful because we use all observations and because we account for some extreme values in luminosity (outliers).

Similar at pixel level

$IQLc$ denotes institutional quality of country c (World Bank's Governance Indicators)

National Institutions and Regional Development Across and within Partitioned Ethnic Groups

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Rule of law				Control of corruption			
	Panel A: Country-ethnic homeland level							
Institutional quality	0.6510***	0.1943	0.5150**	0.2159	0.7904***	0.2566	0.6019***	0.2675
Double-clustered std. err.	(0.1951)	(0.1898)	(0.2024)	(0.2135)	(0.2268)	(0.2197)	(0.2329)	(0.2439)
Adjusted R-squared	0.292	0.792	0.392	0.798	0.298	0.792	0.393	0.798
Within R-squared	—	0.061	—	0.067	—	0.062	—	0.067
Observations	507	507	507	507	507	507	507	507
	Panel B: Pixel level							
Institutional quality	0.1072***	0.0246	0.0834**	0.0278	0.1371***	0.0370	0.1097***	0.0403
Double-clustered std. err.	(0.0400)	(0.0165)	(0.0324)	(0.0181)	(0.0464)	(0.0273)	(0.0415)	(0.0290)
Adjusted R-squared	0.149	0.331	0.202	0.340	0.160	0.331	0.209	0.340
Within R-squared	—	0.059	—	0.066	—	0.059	—	0.066
Observations	42,710	42,710	41,025	41,025	42,710	42,710	41,025	41,025
Ethnicity fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Pop. dens. and area	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Location controls	No	No	Yes	Yes	No	No	Yes	Yes
Geographic controls	No	No	Yes	Yes	No	No	Yes	Yes

Notes. The table reports cross-sectional and within-ethnicity OLS estimates associating regional development with contemporary national institutions, as reflected in World Bank's Governance Matters rule of law index (in columns (1)–(4)) and control of corruption index (in columns (5)–(8)) in areas of partitioned ethnicities at the country-ethnicity level (in Panel A) and at the pixel level (in Panel B). In Panel A the dependent variable is log (0.01 + light density at night from satellite) at the ethnicity-country level. In Panel B the dependent variable is an indicator that takes the value of 1 if the pixel (of 0.125×0.125 decimal degrees) is lit and 0 otherwise. Odd-numbered columns report cross-sectional specifications. Even-numbered columns report within-ethnicity estimates, where we include a vector of ethnicity fixed effects (constants not reported). In all specifications we control for log (population density in 2000) and log land area at the country-ethnicity level (in Panel A) or at the pixel level (in Panel B). In columns (3), (4), (7), and (8) we control for location and geography, augmenting the specification with distance of the centroid of each ethnicity-country (in Panel A) or each pixel (in Panel B) from the capital city of each country, distance from the closest sea coast, and distance from the national border. The set of geographic controls includes log (1 + area under water [lakes, rivers, and other streams]) for the models in Panel A and an indicator that takes the value 1 if there is some water body in the pixel for the models in Panel B, land suitability for agriculture, elevation, a malaria stability index, a diamond mine indicator, and an oil field indicator. Besides the adjusted R-squared, the table also reports the within R-squared (defined as the difference of the overall R-squared minus the overall R-squared of a model simply with ethnicity fixed effects). The Data Appendix gives detailed variable definitions and data sources. Below the estimates we report in parentheses double-clustered standard errors at the country and ethno-linguistic family dimensions. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

↑ higher institutional → ↑ higher levels of development

- Regression Discontinuity Design (RD-polynomials of the distance from the centroid of each pixel) - Discussed on Thursday
- Other analysis - Robustness Check

NEXT LECTURE

Country Debate

Alternative and Introduction to Romer