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In this paper, we propose a theory of institutional differences among countries colonized by Europeans, and exploit this theory to derive a possible source of exogenous variation.

Our theory rests on three premises:

1. There were different types of colonization policies which created different sets of institutions. At one extreme, European powers set up "extractive states", exemplified by the Belgian colonization of the Congo. These institutions did not introduce much protection for private property, nor did they provide checks and balances against government expropriation.

2. In fact, the main purpose of the extractive state was to transfer as much of the resources of the colony to the colonizer. At the other extreme, many Europeans migrated and settled in a number of colonies, creating what the historian Alfred Crosby (1986) calls "Neo-Europes". Settlers tried to replicate European institutions, with strong emphasis on private property and checks against government power. Primary examples of this include Australia, New

Zealand, Canada, and the United States.

2. The colonization strategy was influenced by the feasibility of settlements. In places where the disease environment was not favorable to European settlement, the cards were stacked against the creation of Neo-Europes, and the formation of the extractive state was more likely.

3. The colonial state and institutions persisted even after independence. Based on these three premises, we use the mortality rates expected by the first European settlers in the colonies as an instrument for current institutions in these countries.

More specifically, our theory can be schematically summarized as:

(potential) settler mortality → settlements →early institutions →current institutions ⇒→ current performance

Hall and Jones (1999), in turn, use distance from the equator as an instrument for social infrastructure because, they argue, latitude is correlated with Western influence', which leads to good institutions. The theoretical reasoning for these instruments is not entirely convincing. It is not easy to argue that the Belgian influence in the Congo, or Western influence in the Gold Coast during the era of slavery promoted good institutions.

Ethnolinguistic fragmentation, on the other hand, seems endogenous, especially since such fragmentation almost completely disappeared in Europe during the era of growth when a centralized state and market emerged (see, e.g., Eugen Weber, 1976, Benedict Anderson, 1983).

INSTRUMENTS

Econometrically, the problem with both studies is that their instruments can plausibly have a direct effect on performance. For example, William Easterly and Ross Levine argue that ethnolinguistic fragmentation can affect performance by creating political instability, while Charles de Montesquieu [1748] and more recently David Bloom and Jeffrey Sachs and John Gallup, Andrew Mellinger, and Sachs argue for a direct effect of climate on performance.

If, indeed, these variables have a direct effect, they are invalid instruments and do not establish that it is institutions that matter. The advantage of our approach is that conditional on the variables we already control for, settler mortality more than 100 years ago should have no effect on output today, other than through its effect on institutions. Our results show that distance from equator does not have an independent effect on economic performance, validating use of this variable as an instrument in the work by Hall and Jones.

PERSISTENCE OF INSTITUTIONS

(1) Setting up institutions that place restrictions on government power and enforce property rights is costly (see, e.g., Acemoglu and Thierry Verdier, 1998). If the costs of creating these institutions have been sunk by the colonial powers, then it may not pay the elites at independence to switch to extractive institutions. In contrast, when the new elites inherit extractive institutions, they may not want to incur the costs of introducing better institutions, and may instead prefer to exploit the existing extractive institutions for their own benefits.

(2) The gains to an extractive strategy may depend on the size of the ruling elite. When this elite is small, each member would have a larger share of the revenues, so the elite may have a greater incentive to be extractive. In many cases where European powers set up authoritarian institutions, they delegated the day-to-day running of the state to a small domestic elite. This narrow group often was the one to control the state after independence and favored extractive institutions.

(3) If agents make irreversible investments that are complementary to a particular set of institutions, they will be more willing to support them, making these institutions persist (see, e.g., Acemoglu, 1995). For example, agents who have invested in human and physical capital will be in favor of spending money to enforce property rights, while those who have less to lose may not be.

The linear regressions are for the equation

$$\ln y_i = \mu + \alpha R_i + X'_i \gamma + \varepsilon_i,$$

where y_i is income per capita in country i, R_i is the protection against expropriation measure, X_i is a vector of other covariates, and ε_i is a random error term.

Our main variable, reported in the second row, is an index of protection against expropriation. These data are from Political Risk Services (see, e.g., William Coplin, Michael O'Leary, and Tom Sealy 1993), and were first used in the economics and political science literatures by Knack and Keefer (1995). Political Risk Services reports a value between 0 and 10 for each country and year, with 0 corresponding to the lowest protection against expropriation. We use the average value for each country between 1985 and 1995 (values are missing for many countries before 1985).

This measure is appropriate for our purposes since the focus here is on differences in institutions originating from different types of states and state policies. We expect our notion of extractive state to correspond to a low value of this index, while the tradition of rule of law and well-enforced property rights should correspond to high values. (*Need Instruments for "Protection against Expropriation".*)

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)
							Dep. Var. is log output per worker in 1988	
	Dependent Variable is log GDP per capita in 1995							
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-Squared	0.62	0.54	0.63	0.73	0.56	0.69	0.55	0.49
N	110	64	110	110	64	64	108	61

Dependent Variable: columns 1-8, log GDP per capita (PPP basis) in 1995, current prices, (from the World Bank's World Development Indicators 1999); columns 9-10, 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 including dummies for the anti-expropriation index, the dummy for the first quartile --i.e., with highest risk of expropriation-- is the omitted category. 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.

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 1985-95*									
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-Squared	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-Squared	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

All regressions are OLS, using our base sample. 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.

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, dep. var. 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 1985-95									
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-Squared	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

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 1985-95" 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 1985-95									
Log European Settler Mortality	-0.53 (0.14)	-0.43 (0.16)	-0.59 (0.19)	-0.51 (0.14)	-0.54 (0.13)	-0.44 (0.14)	-0.58 (0.13)	-0.44 (0.15)	-0.48 (0.18)
Latitude		1.97 (1.40)				2.10 (1.30)		2.50 (1.50)	2.30 (1.60)
British Colonial Dummy	0.63 (0.37)	0.55 (0.37)							
French Colonial Dummy	0.05 (0.43)	-0.12 (0.44)							-0.25 (0.89)
French legal origin					-0.67 (0.33)	-0.7 (0.32)			-0.05 (0.91)
R-Squared	0.31	0.33	0.30	0.30	0.32	0.35	0.32	0.35	0.45
Panel C: Ordinary Least Squares									
Average Protection Against Expropriation Risk, 1985-1995	0.53 (0.19)	0.47 (0.07)	0.61 (0.09)	0.47 (0.06)	0.56 (0.06)	0.56 (0.06)	0.53 (0.06)	0.47 (0.06)	0.47 (0.06)
Number of Observations	64	64	25	25	64	64	64	64	64

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. 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.)