Web Appendix

Dynamics and Stagnation in the Malthusian Epoch

Quamrul Ashraf and Oded Galor*

A Variable Definitions and Sources

Population Density in 1 CE, 1000 CE, and 1500 CE: Population density in a given year is calculated as population in that year, as reported by Colin McEvedy and Richard Jones (1978), divided by land area today, as reported by the World Bank's *World Development Indicators*. The cross-sectional unit of observation in McEvedy and Jones' dataset is a region delineated by its international borders in 1975. Historical population estimates are provided for regions corresponding to either individual countries or, in some cases, to sets comprised of 2-3 neighboring countries (e.g., India, Pakistan and Bangladesh). In the latter case, a set-specific population density figure is calculated based on total land area and the figure is then assigned to each of the component countries in the set. The same methodology is also employed to obtain population density for countries that exist today but were part of a larger political unit (e.g., the former Yugoslavia) in 1975. The population data reported by the authors are based on a wide variety of country and region-specific historical sources, the enumeration of which would be impractical for this appendix. The interested reader is therefore referred to McEvedy and Jones (1978) for more details on the original data sources cited therein.

Income per Capita in 1 CE, 1000 CE, and 1500 CE: The level of income per capita, as reported by Angus Maddison (2003), for a given year. Additional details are available on the author's website. The interested reader is also referred to www.ggdc.net/maddison/other%5Fbooks/HS-8%5F2003.pdf for a discussion of the data by the author.

*Ashraf: Department of Economics, Williams College, Schapiro Hall, 24 Hopkins Hall Dr., Williamstown, MA 01267 (email: Quamrul.H.Ashraf@williams.edu); Galor: Department of Economics, Brown University, Robinson Hall, 64 Waterman St., Providence, RI 02912 (email: Oded_Galor@brown.edu).

Years since Neolithic Transition: The number of thousand years elapsed, until the year 2000, since the majority of the population residing within a country's modern national borders began practicing sedentary agriculture as the primary mode of subsistence. This measure, reported by Louis Putterman (2008), is compiled using a wide variety of both regional and country-specific archaeological studies as well as more general encyclopedic works on the transition from hunting and gathering to agriculture during the Neolithic. The reader is referred to www.econ.brown.edu/fac/Louis%5FPutterman/agricultural%20data%20page.htm for a detailed description of the primary and secondary data sources employed by the author in the construction of this variable.

Plants and Animals (used as instrumental variables): The number of domesticable species of plants and animals, respectively, that were prehistorically native to the continent or landmass to which a country belongs. These variables are obtained from the dataset of Ola Olsson and Douglas A. Hibbs, Jr. (2005).

Land Productivity: This measure is composed of (1) the percentage of arable land, as reported by the *World Development Indicators*, and (2) an index of the suitability of land for agriculture, based on geospatial soil pH and temperature data, as reported by Navin Ramankutty et al. (2002) and aggregated to the country level by Stelios Michalopoulos (2008). In particular, log land productivity is the first principal component of the logs of these variables, capturing 83 percent of their combined variation.

Absolute Latitude: The absolute value of the latitude of a country's approximate geodesic centroid, as reported by *The World Factbook*, an online resource maintained by Central Intelligence Agency (CIA), accessible at https://www.cia.gov/library/publications/the-world-factbook/.

Mean Distance to Nearest Coast or River: The distance, in thousands of kilometers, from a GIS grid cell to the nearest ice-free coastline or sea-navigable river, averaged across the grid cells of a country. This variable is part of Harvard University's Center for International Development (CID) Research Datasets on *General Measures of Geography*, available online at http://www.cid.harvard.edu/ciddata/geographydata.htm.

Percentage of Land within 100 km of Coast or River: The percentage of a country's total land area that is located within 100 kilometers of an ice-free coastline or sea-navigable river, as reported by the CID Research Datasets on *General Measures of Geography.*

Technology Index in 1000 BCE, 1 CE, and 1000 CE: The index of technology for a given year is constructed using worldwide historical cross-cultural data on sector-specific levels of technology, reported on a 3-point scale by the *Atlas of Cultural Evolution* (Peter N. Peregrine, 2003). Following the aggregation

methodology adopted by Diego Comin, William Easterly, and Erick Gong (2008), the index employs technology data on four sectors, including communications, industry (i.e., ceramics and metallurgy), transportation, and agriculture.

The level of technology in each sector is indexed as follows. In the communications sector, the index is assigned a value of 0 under the absence of both true writing and mnemonic or non-written records, a value of 1 under the presence of only mnemonic or non-written records, and a value of 2 under the presence of both. In the industrial sector, the index is assigned a value of 0 under the absence of both metalworks and pottery, a value of 1 under the presence of only pottery, and a value of 2 under the presence of both. In the transportation sector, the index is assigned a value of 0 under the absence of both vehicles and pack or draft animals, a value of 1 under the presence of only pack or draft animals, and a value of 2 under the presence of both. Finally, in the agricultural sector, the index is assigned a value of 0 under the absence of sedentary agriculture, a value of 1 when agriculture is practiced but only as a secondary mode of subsistence, and a value of 2 when agriculture is practiced as the primary mode of subsistence. In all cases, the sector-specific indices are normalized to assume values in the $[0, 1]$-interval. The technology index for a given culture is thus the unweighted average across sectors of the sector-specific indices for that culture.

Given that the cross-sectional unit of observation in Peregrine's dataset is an archaeological tradition or culture, specific to a given region on the global map, and since spatial delineations in Peregrine's dataset do not necessarily correspond to contemporary international borders, the culture-specific technology index in a given year is aggregated to the country level by averaging across those cultures from Peregrine's map that appear within the modern borders of a given country. For more details on the underlying data and the aggregation methodology employed to construct this index, the reader is referred to Peregrine (2003) and Comin, Easterly, and Gong (2008).

Non-agricultural Technology Index in 1000 BCE, 1 CE, and 1000 CE: The index of non-agricultural technology for a given year is based on the same underlying data and aggregation methodology discussed above for the overall technology index. However, unlike the overall index, the non-agricultural counterpart incorporates data on the sector-specific technology indices for only the communications, industrial (i.e., ceramics and metallurgy), and transportation sectors.

Distance to Frontier in 1500 CE: The distance, in thousands of kilometers, from a country's modern capital city to the closest regional technological frontier in the year 1500 CE, as reported by Quamrul Ashraf and Oded Galor (2010). Specifically, the authors employ historical urbanization estimates from Tertius Chandler (1987) and George Modelski (2003) to identify frontiers based on the size of urban populations,

selecting the two largest cities from each continent that belong to different sociopolitical entities. Thus, in the year 1500 CE, the set of regional frontiers comprises London (UK), Paris (France), Cairo (Egypt), Fez (Morocco), Constantinople (Turkey), Peking (China), Tenochtitlan (Mexico), and Cuzco (Peru). For additional details, the reader is referred to Ashraf and Galor (2010).

Percentage of Land in Temperate Zones: The percentage of a country's total land area in Köppen-Geiger temperate zones (including zones classified as Cf, Cs, Df, and Dw), as reported by the CID Research Datasets on *General Measures of Geography*.

Percentage of Land in Tropical and Subtropical Zones: The percentage of a country's total land area in Köppen-Geiger tropical and subtropical zones (including zones classified as Af, Am, Aw, and Cw), as reported by the CID Research Datasets on *General Measures of Geography*.

Small Island and Landlocked Dummies: 0/1-indicators for whether or not a country is a small island nation, and whether or not it possesses a coastline. These variables are constructed by the authors based on information reported by the CIA in *The World Factbook* online resource.

B Descriptive Statistics

TABLE W.1: Descriptive Statistics – Means and Standard Deviations

	Obs.	Mean	S.D.	Min.	Max.
Log Population Density in 1500 CE	184	0.883	1.424	-3.817	4.135
Log Population Density in 1000 CE	177	0.449	1.366	-4.510	3.442
Log Population Density in 1 CE	155	-0.163	1.455	-4.510	3.170
Log Income per Capita in 1500 CE	31	6.343	0.260	5.991	7.003
Log Income per Capita in 1000 CE	28	6.084	0.141	5.991	6.477
Log Income per Capita in 1 CE	30	6.129	0.163	5.991	6.696
Log Years since Neolithic Transition	164	8.313	0.642	5.892	9.259
Log Technology Index in 1000 CE	149	0.573	0.160	0.118	0.693
Log Technology Index in 1 CE	149	0.529	0.163	0.061	0.693
Log Land Productivity	158	0.000	1.293	-4.815	1.657
Log Absolute Latitude	205	2.913	0.967	-0.693	4.277
Mean Distance to Nearest Coast or River	160	0.342	0.471	0.008	2.386
Percentage of Land within 100 km of Coast or River	160	0.463	0.375	0.000	1.000
Log Distance to Frontier	207	7.499	1.435	0.000	9.288
Percentage of Land in Temperate Zones	160	0.297	0.420	0.000	1.000
Percentage of Land in (Sub)Tropical Zones	160	0.364	0.433	0.000	1.000

TABLE W.2: Descriptive Statistics – Pairwise Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Log Population Density in 1500 CE	1.000 (184)														
Log Population Density in 1000 CE	0.965 (177)	1.000 (177)													
Log Population Density in 1 CE	0.881 (155)	0.940 (155)	1.000 (155)												
Log Income per Capita in 1500 CE	0.726 (31)	0.641 (29)	0.670 (29)	1.000 (31)											
Log Income per Capita in 1000 CE	0.128 (28)	0.238 (26)	0.253 (26)	0.106 (28)	1.000 (28)										
Log Income per Capita in 1 CE	0.225 (30)	0.323 (29)	0.453 (29)	0.337 (27)	0.485 (27)	1.000 (30)									
Log Years since Neolithic Transition	0.498 (158)	0.571 (152)	0.638 (135)	0.561 (31)	0.463 (28)	0.415 (30)	1.000 (164)								
Log Technology Index in 1000 CE	0.584 (148)	0.562 (143)	0.565 (131)	0.646 (31)	0.303 (28)	0.329 (30)	0.715 (146)	1.000 (149)							
Log Technology Index in 1 CE	0.495 (148)	0.524 (144)	0.554 (132)	0.635 (30)	0.283 (27)	0.380 (30)	0.597 (146)	0.827 (148)	1.000 (149)						
Log Land Productivity	0.509 (152)	0.433 (147)	0.397 (131)	0.408 (31)	-0.115 (28)	-0.051 (30)	-0.002 (151)	-0.011 (146)	-0.126 (146)	1.000 (158)					
Log Absolute Latitude	0.139 (184)	0.147 (177)	0.347 (155)	0.320 (31)	-0.363 (28)	-0.302 (30)	0.304 (163)	0.325 (149)	0.279 (149)	0.120 (158)	1.000 (205)				
Mean Distance to Nearest Coast or River	-0.302 (157)	-0.326 (152)	-0.358 (136)	-0.387 (31)	0.173 (28)	-0.123 (30)	-0.020 (154)	0.003 (148)	-0.042 (148)	-0.167 (153)	-0.014 (160)	1.000 (160)			
Percentage of Land within 100 km of Coast or River	0.367 (157)	0.343 (152)	0.365 (136)	0.452 (31)	-0.417 (28)	0.002 (30)	0.091 (154)	0.086 (148)	0.095 (148)	0.215 (153)	0.212 (160)	-0.670 (160)	1.000 (160)		
Log Distance to Frontier	-0.351 (184)	-0.363 (177)	-0.429 (155)	-0.168 (31)	-0.025 (28)	-0.055 (30)	-0.396 (164)	-0.271 (149)	-0.258 (149)	-0.121 (158)	-0.369 (205)	0.156 (160)	-0.195 (160)	1.000 (207)	
Percentage of Land in Temperate Zones	0.355 (157)	0.347 (152)	0.372 (136)	0.420 (31)	-0.544 (28)	-0.188 (30)	0.273 (154)	0.258 (148)	0.168 (148)	0.326 (153)	0.605 (160)	-0.263 (160)	0.422 (160)	-0.327 (160)	1.000 (160)
Percentage of Land in (Sub)Tropical Zones	-0.071 (157)	-0.094 (152)	-0.225 (136)	-0.226 (31)	-0.007 (28)	-0.093 (30)	-0.436 (154)	-0.476 (148)	-0.461 (148)	0.160 (153)	-0.710 (160)	-0.136 (160)	0.024 (160)	0.334 (160)	-0.577 (160)

NOTES – Number of observations in parentheses.

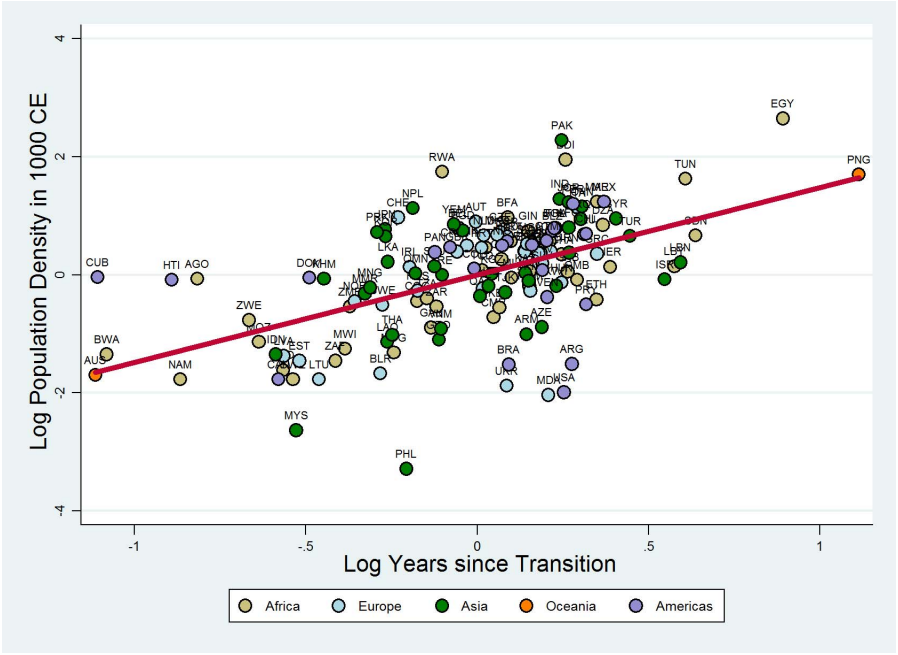
C Supplementary Results

This online appendix section collects some supplementary figures referred to in the text, and presents some additional findings demonstrating the robustness of the main results.

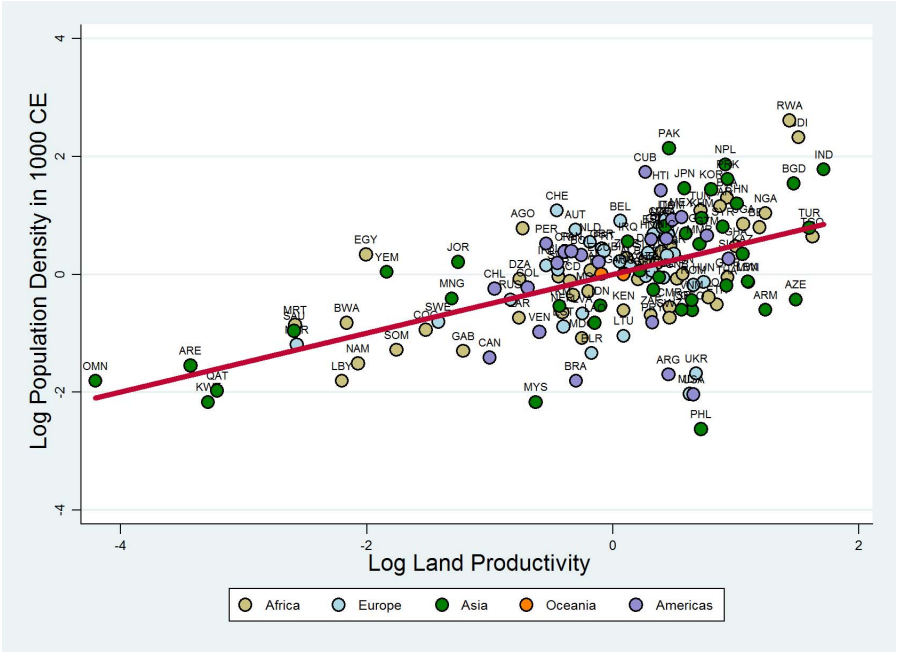
Specifically, Figures W.1(a) and W.1(b) depict the partial regression lines associated with the transition-timing and land-productivity channels, respectively, in the baseline regression for population density in 1000 CE, whereas Figures W.2(a) and W.2(b) perform the same for population density in 1 CE. Moreover, Figures W.3 and W.4 illustrate the extent of cross-sectional and intertemporal variation prevalent across Maddison's (2003) historical income per capita estimates. Finally, the partial regression lines associated with the period-specific indices of technology in the baseline regressions for population density in 1000 CE and 1 CE are depicted in Figures W.5(a) and W.5(b) respectively.

With respect to additional results demonstrating robustness, Table W.3 establishes that the results for population density and income per capita in 1500 CE are robust under two alternative specifications that relax potential constraints imposed by the baseline regression models, including (i) the treatment of the Americas as a single entity in accounting for continental fixed effects, and (ii) the employment of only the *common variation* in (the logs of) the percentage of arable land and the index of agricultural suitability when accounting for the effect of the land-productivity channel by way of the first principal component of these two variables.

Given that historical population estimates are also available from Maddison (2003), albeit for a smaller set of countries than McEvedy and Jones (1978), Table W.4 demonstrates that the baseline results for population density in the three historical periods, obtained using data from McEvedy and Jones, are indeed qualitatively unchanged under Maddison's alternative population estimates. Finally, given the possibility that the disturbance terms in the baseline regression models may be non-spherical in nature, particularly since economic development has been spatially clustered in certain regions of the world, Tables W.5 and W.6 repeat the baseline analyses for population density and income per capita in the three historical periods (i.e., the years 1500 CE, 1000 CE, and 1 CE), with the standard errors of the point estimates corrected for spatial autocorrelation following the methodology of Timothy G. Conley (1999).



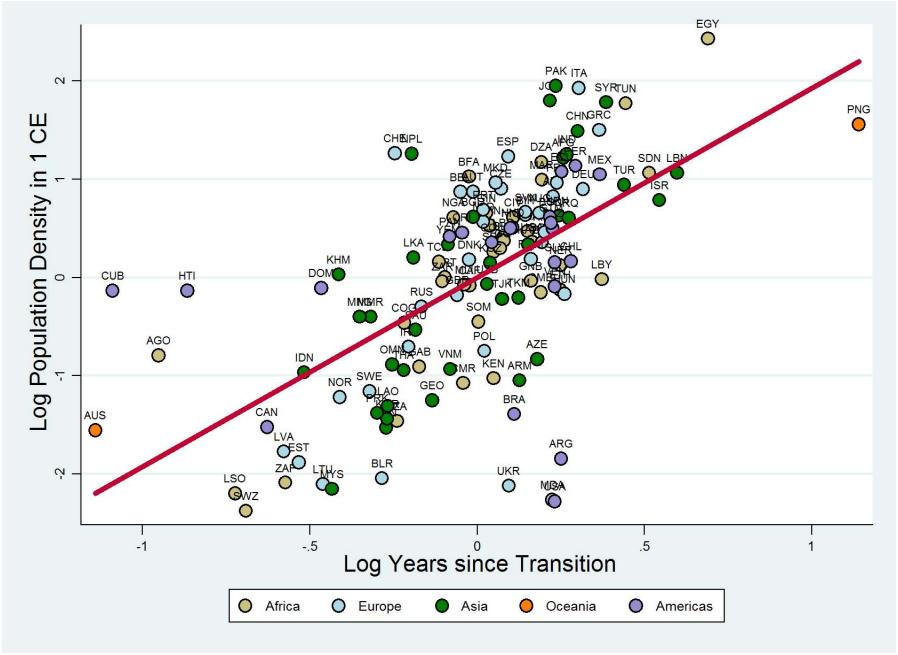
(a) The Partial Effect of Transition Timing on Population Density in 1000 CE



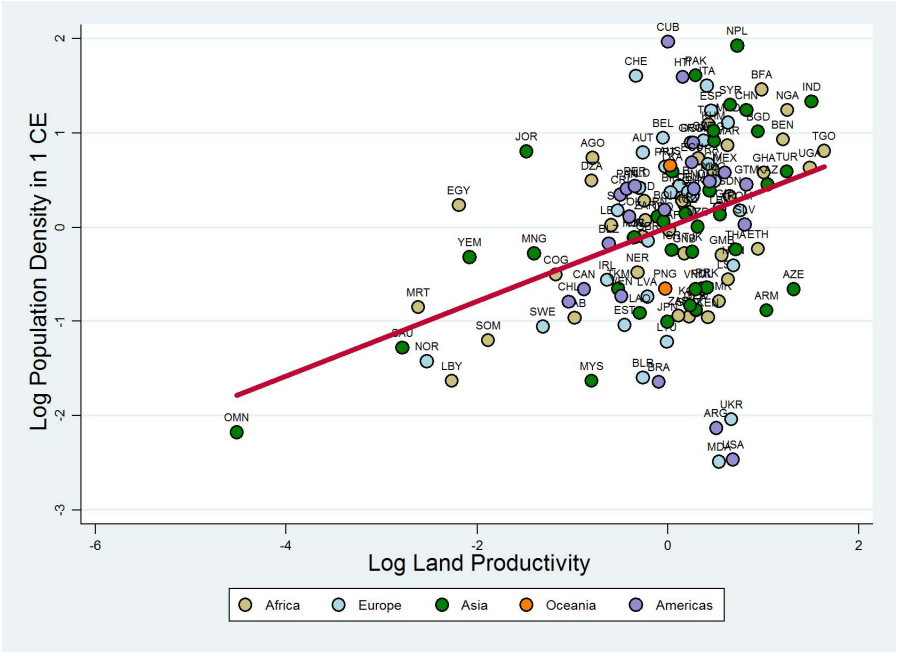
(b) The Partial Effect of Land Productivity on Population Density in 1000 CE

FIGURE W.1: Transition Timing, Land Productivity, and Population Density in 1000 CE

SUMMARY – This figure depicts the partial regression line for the effect of transition timing (land productivity) on population density in the year 1000 CE, while controlling for the influence of land productivity (transition timing), absolute latitude, access to waterways, and continental fixed effects. Thus, the x- and y-axes plot the residuals obtained from regressing transition timing (land productivity) and population density, respectively, on the aforementioned set of covariates.



(a) The Partial Effect of Transition Timing on Population Density in 1 CE



(b) The Partial Effect of Land Productivity on Population Density in 1 CE

FIGURE W.2: Transition Timing, Land Productivity, and Population Density in 1 CE

SUMMARY – This figure depicts the partial regression line for the effect of transition timing (land productivity) on population density in the year 1 CE, while controlling for the influence of land productivity (transition timing), absolute latitude, access to waterways, and continental fixed effects. Thus, the x- and y-axes plot the residuals obtained from regressing transition timing (land productivity) and population density, respectively, on the aforementioned set of covariates.

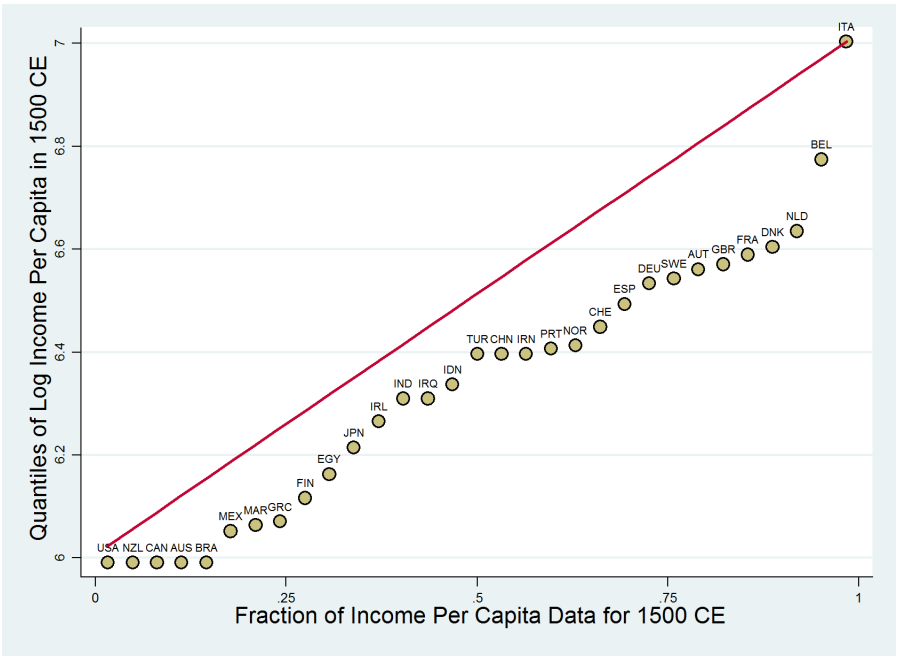


FIGURE W.3: The Cross-Sectional Variability of Income per Capita in 1500 CE

SUMMARY – This figure depicts the cross-sectional variability of Maddison's (2003) income per capita estimates for the year 1500 CE. The x-axis plots the cumulative fraction of the data corresponding to each observation (in ascending order), and the y-axis plots the quantiles of the uniform distribution of log income per capita in 1500 CE. The closer the observations are to the 45-degree line, the more uniformly distributed is the data and, hence, the larger is the cross-sectional variability.

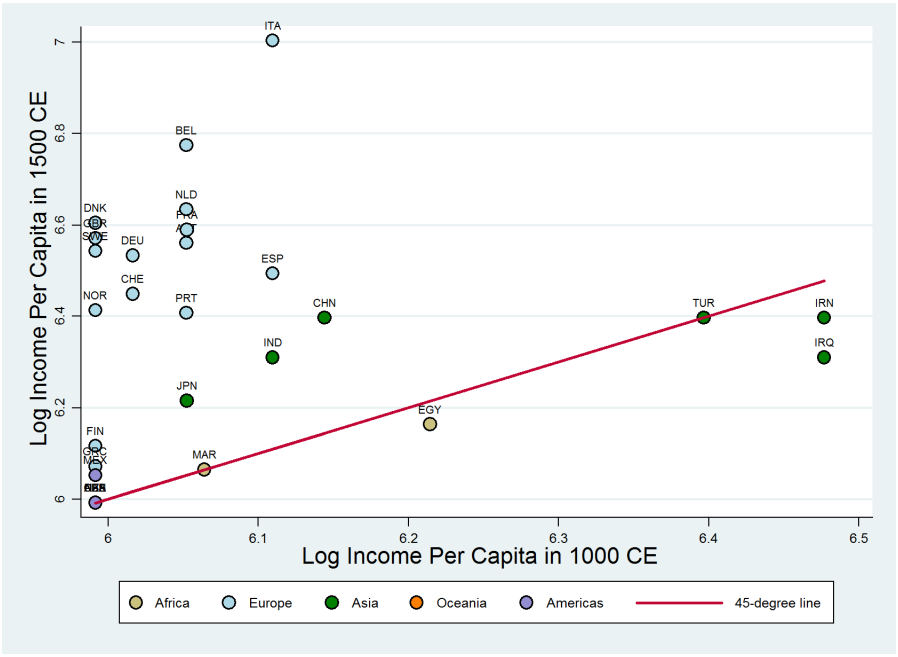
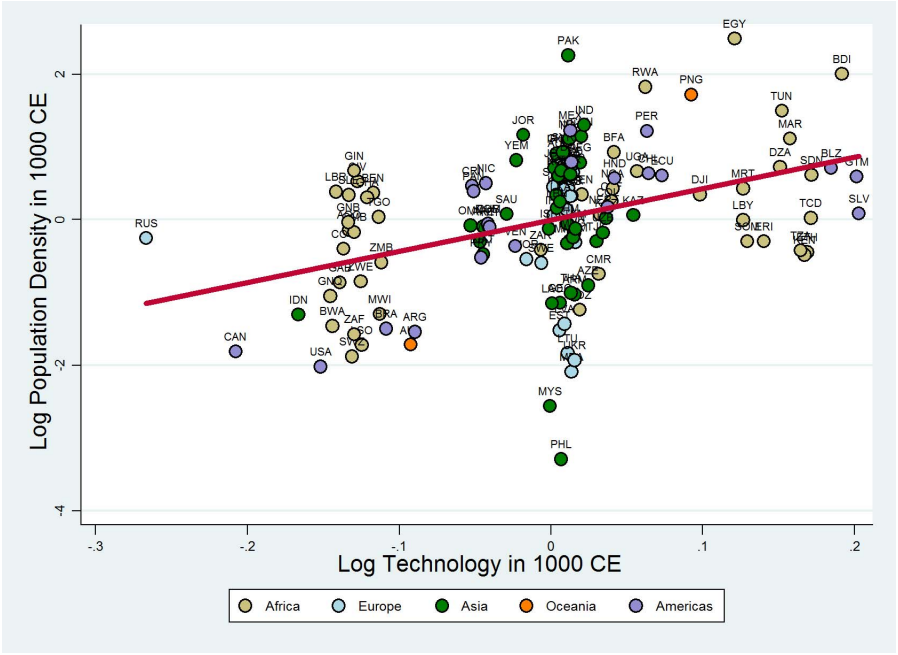
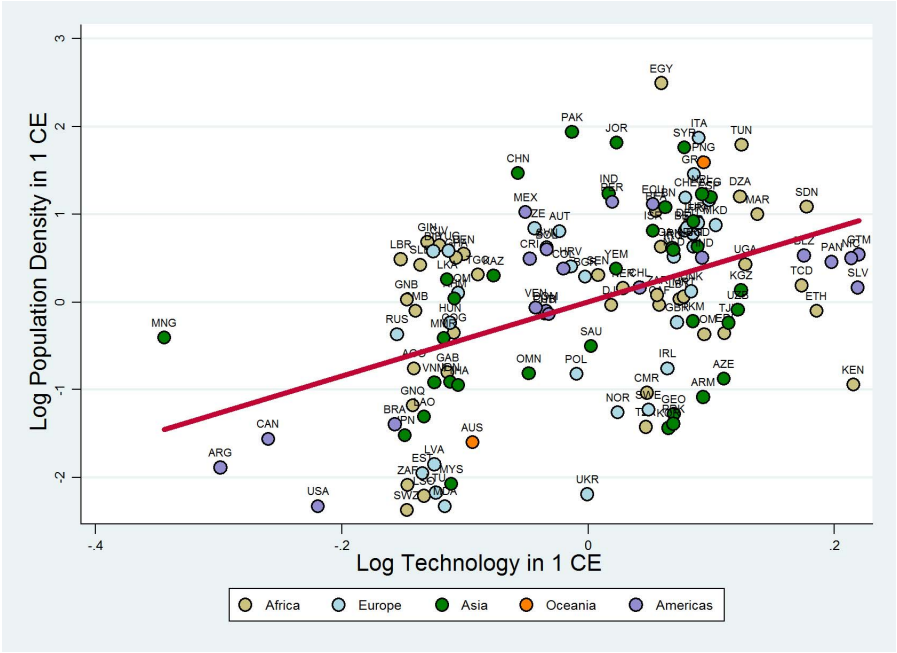


FIGURE W.4: The Intertemporal Variability of Income per Capita, 1000-1500 CE

SUMMARY – This figure depicts the intertemporal variability of Maddison's (2003) income per capita estimates over the time period 1000-1500 CE. The x- and y-axes plot income per capita in the years 1000 CE and 1500 CE respectively. The farther the observations are from the 45-degree line, the greater is the intertemporal variability.



(a) The Partial Effect of Technology on Population Density in 1000 CE



(b) The Partial Effect of Technology on Population Density in 1 CE

FIGURE W.5: Technological Sophistication and Population Density in 1000 CE and 1 CE

SUMMARY – This figure depicts the partial regression lines for the effect of technological sophistication on population density in the years 1000 CE and 1 CE, respectively, while controlling for the influence of land productivity, absolute latitude, access to waterways, and continental fixed effects. Thus, for a given year, the x- and y-axes plot the residuals obtained from regressing the technology index and population density, respectively, for that year on the aforementioned set of covariates.

TABLE W.3: Robustness to Alternative Specifications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Standard OLS	Standard OLS	Standard OLS	Weighted OLS	Standard OLS	Standard OLS	Standard OLS	Weighted OLS
	Full Sample	Income Sample	Income Sample	Income Sample	Full Sample	Income Sample	Income Sample	Income Sample
	Alternative Specification Includes:							
	Both North and South America Dummies				Both Components of Land Productivity			
	Dependent Variable is:							
	Log Population Density in 1500 CE		Log Income per Capita in 1500 CE		Log Population Density in 1500 CE		Log Income per Capita in 1500 CE	
Log Years since Neolithic Transition	1.169***	1.390**	0.160	0.174	1.079***	1.536**	0.145	0.151
	(0.183)	(0.649)	(0.143)	(0.166)	(0.183)	(0.596)	(0.163)	(0.208)
Log Land Productivity	0.562***	0.562***	0.040	0.039				
	(0.052)	(0.157)	(0.025)	(0.023)				
Log Absolute Latitude	-0.341***	-0.091	-0.045	-0.043	-0.325***	0.124	-0.046	-0.046
	(0.104)	(0.554)	(0.086)	(0.084)	(0.108)	(0.423)	(0.067)	(0.071)
Mean Distance to Nearest Coast or River	-0.477***	-0.501	0.213	0.219	-0.390***	-0.248	0.203	0.187
	(0.142)	(1.300)	(0.198)	(0.206)	(0.142)	(1.102)	(0.226)	(0.267)
Percentage of Land within 100 km of Coast or River	0.703**	1.803*	0.122	0.153	0.900***	1.693**	0.135	0.153
	(0.302)	(0.865)	(0.147)	(0.173)	(0.284)	(0.723)	(0.135)	(0.178)
Log Arable Percentage of Land					0.343***	-0.315	0.064	0.079
					(0.095)	(0.504)	(0.085)	(0.117)
Log Suitability Index for Agriculture					0.270***	0.736*	-0.008	-0.017
					(0.086)	(0.356)	(0.067)	(0.084)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	147	31	31	31	147	31	31	31
R-squared	0.74	0.89	0.66	0.54	0.73	0.90	0.66	0.54

NOTES – (i) log land productivity in regressions (1)-(4) is the first principal component of the log of the percentage of arable land and the log of the agricultural suitability index that are used in regressions (5)-(8); (ii) the weight of country i in regressions (4) and (8) is *inversely* proportional to the frequency with which i's income per capita occurs in the corresponding samples, i.e., $w_i = n_i^{-1} / \sum_i n_i^{-1}$, where n_i is the number of countries with income per capita identical to i; (iii) a single continent dummy is used to represent the Americas in regressions (5)-(8); (iv) robust standard error estimates are reported in parentheses; (v) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE W.4: Robustness to Population Data from Maddison's Historical Statistics

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	OLS	OLS	OLS	OLS
	Full Sample	Income Sample	Full Sample	Income Sample	Full Sample	Income Sample
	Dependent Variable is Log Population Density based on Maddison's Estimates for:					
	1500 CE		1000 CE		1 CE	
Log Years since Neolithic Transition	1.190***	0.984*	1.845***	0.809***	1.865***	0.824***
	(0.287)	(0.498)	(0.360)	(0.273)	(0.576)	(0.277)
Log Land Productivity	0.481***	0.625***	0.489***	0.348***	0.474***	0.582**
	(0.115)	(0.184)	(0.137)	(0.104)	(0.163)	(0.219)
Log Absolute Latitude	-0.102	0.109	0.012	-1.838**	0.092	-2.207***
	(0.293)	(0.401)	(0.297)	(0.635)	(0.265)	(0.638)
Mean Distance to Nearest Coast or River	-0.983*	-0.844	-0.941*	-0.616	-1.128	-0.501
	(0.551)	(1.066)	(0.535)	(0.606)	(0.707)	(0.601)
Percentage of Land within 100 km of Coast or River	1.546**	1.492**	0.954	1.446**	1.182	1.119
	(0.583)	(0.688)	(0.725)	(0.630)	(0.773)	(0.733)
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	48	31	47	26	43	29
R-squared	0.85	0.88	0.84	0.95	0.81	0.92

NOTES – (i) log land productivity is the first principal component of the log of the percentage of arable land and the log of an agricultural suitability index; (ii) a single continent dummy is used to represent the Americas, which is natural given the historical period examined; (iii) regressions (4)-(6) do not employ the Oceania dummy due to a single observation for this continent in the corresponding regression samples; (iv) robust standard error estimates are reported in parentheses; (v) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE W.5: Robustness to Corrections for Spatial Autocorrelation

	(1)	(2)	(3)	(4)	(5)	(6)
	Corrected OLS	Spatial GMM	Corrected OLS	Spatial GMM	Corrected OLS	Spatial GMM
	Full Sample	Restricted Sample	Full Sample	Restricted Sample	Full Sample	Restricted Sample
	Dependent Variable is Log Population Density in:					
	1500 CE		1000 CE		1 CE	
Log Years since Neolithic Transition	1.087***	2.038***	1.480***	2.713***	1.930***	3.322***
	[0.184]	[0.387]	[0.213]	[0.498]	[0.316]	[0.404]
Log Land Productivity	0.576***	0.583***	0.497***	0.575***	0.394***	0.448***
	[0.053]	[0.092]	[0.066]	[0.095]	[0.076]	[0.093]
Log Absolute Latitude	-0.314***	-0.257*	-0.229*	-0.117	0.057	0.124
	[0.108]	[0.141]	[0.123]	[0.138]	[0.101]	[0.115]
Mean Distance to Nearest Coast or River	-0.392**	0.318	-0.528**	0.373	-0.685***	-0.423
	[0.195]	[0.351]	[0.207]	[0.370]	[0.168]	[0.294]
Percentage of Land within 100 km of Coast or River	0.899***	1.395***	0.716**	1.550***	0.857**	1.143**
	[0.319]	[0.417]	[0.351]	[0.409]	[0.371]	[0.461]
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	147	96	142	94	128	83
R-squared	0.73	0.70	0.67	0.62	0.69	0.72

NOTES – (i) log land productivity is the first principal component of the log of the percentage of arable land and the log of an agricultural suitability index; (ii) the spatial GMM regressions employ the numbers of prehistoric domesticable species of plants and animals as instruments for log transition timing; (iii) a single continent dummy is used to represent the Americas, which is natural given the historical period examined; (iv) the spatial GMM regressions do not employ the Oceania dummy due to a single observation for this continent in the corresponding regression samples; (v) standard errors corrected for spatial autocorrelation are reported in square brackets; (vi) the spatial distribution of countries in $\Re^2$ is specified using aerial distances between geodesic centroids; (vii) the spatial autocorrelation in error terms is modelled as declining linearly along a 4,000 km radius from each observation; (viii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE W.6: Additional Robustness to Corrections for Spatial Autocorrelation

	(1)	(2)	(3)	(4)	(5)	(6)
	Corrected OLS	Corrected OLS	Corrected OLS	Corrected OLS	Corrected OLS	Corrected OLS
	Dependent Variable is:					
	Log Income per Capita in:			Log Population Density in:		
	1500 CE	1000 CE	1 CE	1500 CE	1000 CE	1 CE
Log Years since Neolithic Transition	0.159**	0.073*	0.109	1.337***	0.832***	1.006***
	[0.064]	[0.038]	[0.069]	[0.437]	[0.263]	[0.376]
Log Land Productivity	0.041**	-0.021	-0.001	0.584***	0.364***	0.681***
	[0.016]	[0.023]	[0.020]	[0.125]	[0.098]	[0.147]
Log Absolute Latitude	-0.041	0.060	-0.175	0.050	-2.140***	-2.163***
	[0.043]	[0.108]	[0.123]	[0.343]	[0.704]	[0.838]
Mean Distance to Nearest Coast or River	0.215**	-0.111	0.043	-0.429	-0.237	0.118
	[0.100]	[0.125]	[0.116]	[0.893]	[0.656]	[0.859]
Percentage of Land within 100 km of Coast or River	0.124*	-0.150	0.042	1.855***	1.326**	0.228
	[0.075]	[0.110]	[0.082]	[0.620]	[0.524]	[0.605]
Continent Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	31	26	29	31	26	29
R-squared	0.66	0.68	0.33	0.88	0.95	0.89

NOTES – (i) log land productivity is the first principal component of the log of the percentage of arable land and the log of an agricultural suitability index; (ii) a single continent dummy is used to represent the Americas, which is natural given the historical period examined; (iii) regressions (2)-(3) and (5)-(6) do not employ the Oceania dummy due to a single observation for this continent in the corresponding regression samples; (iv) standard errors corrected for spatial autocorrelation are reported in square brackets; (v) the spatial distribution of countries in $\Re^2$ is specified using aerial distances between geodesic centroids; (vi) the spatial autocorrelation in error terms is modelled as declining linearly along a 4,000 km radius from each observation; (vii) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

References

Ashraf, Quamrul, and Oded Galor. 2010. "The Out-of-Africa Hypothesis, Human Genetic Diversity, and Comparative Economic Development." Brown University Working Paper 2010–7.

Chandler, Tertius. 1987. *Four Thousand Years of Urban Growth: An Historical Census.* Lewiston, NY: The Edwin Mellen Press.

Comin, Diego, William Easterly, and Erick Gong. 2008. "Was the Wealth of Nations Determined in 1000 B.C.?" Harvard Business School Working Paper 09–052.

Conley, Timothy G. 1999. "GMM Estimation with Cross Sectional Dependence." *Journal of Econometrics*, 92(1): 1–45.

Maddison, Angus. 2003. *The World Economy: Historical Statistics.* Paris, France: OECD.

McEvedy, Colin, and Richard Jones. 1978. *Atlas of World Population History.* New York, NY: Penguin Books Ltd.

Michalopoulos, Stelios. 2008. "The Origins of Ethnolinguistic Diversity: Theory and Evidence." Tufts University Discussion Paper 0725.

Modelski, George. 2003. *World Cities: -3000 to 2000.* Washington, DC: FAROS 2000.

Olsson, Ola, and Douglas A. Hibbs, Jr. 2005. "Biogeography and Long-Run Economic Development." *European Economic Review*, 49(4): 909–938.

Peregrine, Peter N. 2003. "Atlas of Cultural Evolution." *World Cultures: Journal of Comparative and Cross-Cultural Research*, 14(1): 1–75.

Putterman, Louis. 2008. "Agriculture, Diffusion, and Development: Ripple Effects of the Neolithic Revolution." *Economica*, 75(300): 729–748.

Ramankutty, Navin, Jonathan A. Foley, John Norman, and Kevin McSweeney. 2002. "The Global Distribution of Cultivable Lands: Current Patterns and Sensitivity to Possible Climate Change." *Global Ecology and Biogeography*, 11(5): 377–392.