

Online Data appendix

This data appendix details construction (where applicable), sources, and any other relevant information for all variables used in the paper. References are provided in the final section of the appendix.

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Country Sample

Our country sample covers 141 countries. The countries also present in the restricted sample (Murtin and Wacziarg, 2013) appear below as well.

Comparison of country sample between our sample (141 countries using literacy data) and restricted sample (73 countries using educational attainment from Morrisson and Murtin 2009)

<i>Country</i>	<i>Our sample</i>	<i>Restricted Sample</i>	<i>Country</i>	<i>Our sample</i>	<i>Restricted Sample</i>
<i>Afghanistan</i>	X		<i>Lao PDR</i>	X	
<i>Albania</i>	X		<i>Latvia</i>	X	
<i>Algeria</i>	X	X	<i>Lebanon</i>	X	
<i>Angola</i>	X	X	<i>Lesotho</i>	X	
<i>Argentina</i>	X	X	<i>Liberia</i>	X	
<i>Australia</i>	X	X	<i>Libya</i>	X	
<i>Austria</i>	X	X	<i>Lithuania</i>	X	
<i>Bahrain</i>	X		<i>Madagascar</i>	X	X
<i>Bangladesh</i>	X		<i>Malawi</i>	X	X
<i>Belgium</i>	X	X	<i>Malaysia</i>	X	X
<i>Benin</i>	X	X	<i>Mali</i>	X	X
<i>Bhutan</i>	X		<i>Mauritania</i>	X	
<i>Bolivia</i>	X		<i>Mauritius</i>	X	
<i>Botswana</i>	X		<i>Mexico</i>	X	X
<i>Brazil</i>	X	X	<i>Mongolia</i>	X	
<i>Bulgaria</i>	X	X	<i>Morocco</i>	X	X
<i>Burkina Faso</i>	X		<i>Mozambique</i>	X	X
<i>Burundi</i>	X		<i>Myanmar</i>	X	X
<i>Cambodia</i>	X		<i>Namibia</i>	X	
<i>Cameroon</i>	X	X	<i>Nepal</i>	X	
<i>Canada</i>	X	X	<i>Netherlands</i>	X	X

<i>Cape Verde</i>	X		<i>New Zealand</i>	X	X
<i>Central African Republic</i>	X		<i>Nicaragua</i>	X	X
<i>Chad</i>	X		<i>Niger</i>	X	X
<i>Chile</i>	X	X	<i>Nigeria</i>	X	X
<i>China</i>	X		<i>Norway</i>	X	X
<i>Colombia</i>	X		<i>Oman</i>	X	
<i>Comoros</i>	X		<i>Pakistan</i>	X	
<i>Congo. Dem. Rep.</i>	X		<i>Panama</i>	X	X

Table A1. contd.

<i>Country</i>	<i>Our sample</i>	<i>Restricted Sample</i>	<i>Country</i>	<i>Our sample</i>	<i>Restricted Sample</i>
<i>Congo. Rep.</i>	X		<i>Papua New Guinea</i>	X	
<i>Costa Rica</i>	X	X	<i>Paraguay</i>	X	X
<i>Cote d'Ivoire</i>	X	X	<i>Peru</i>	X	X
<i>Cuba</i>	X	X	<i>Philippines</i>	X	X
<i>Cyprus</i>	X		<i>Poland</i>	X	
<i>Denmark</i>	X	X	<i>Portugal</i>	X	X
<i>Djibouti</i>	X		<i>Qatar</i>	X	
<i>Dominican Republic</i>	X	X	<i>Romania</i>	X	
<i>Ecuador</i>	X		<i>Russian Federation</i>	X	
<i>Egypt. Arab Rep.</i>	X	X	<i>Rwanda</i>	X	
<i>El Salvador</i>	X	X	<i>Saudi Arabia</i>	X	
<i>Equatorial Guinea</i>	X		<i>Senegal</i>	X	X
<i>Estonia</i>	X		<i>Sierra Leone</i>	X	X
<i>Fiji</i>	X		<i>Singapore</i>	X	
<i>Finland</i>	X	X	<i>Solomon Islands</i>	X	
<i>France</i>	X	X	<i>Somalia</i>	X	
<i>Gabon</i>	X		<i>South Africa</i>	X	X
<i>Gambia. The</i>	X		<i>Spain</i>	X	X
<i>Germany</i>	X	X	<i>Sri Lanka</i>	X	
<i>Ghana</i>	X	X	<i>Sudan</i>	X	X
<i>Greece</i>	X	X	<i>Swaziland</i>	X	
<i>Guatemala</i>	X	X	<i>Sweden</i>	X	X
<i>Guinea</i>	X		<i>Switzerland</i>	X	X
<i>Guinea-Bissau</i>	X		<i>Syrian Arab Republic</i>	X	X
<i>Guyana</i>	X	X	<i>Taiwan, China</i>	X	
<i>Haiti</i>	X		<i>Tanzania</i>	X	
<i>Honduras</i>	X	X	<i>Thailand</i>	X	X
<i>Hungary</i>	X	X	<i>Togo</i>	X	
<i>India</i>	X	X	<i>Trinidad and Tobago</i>	X	

<i>Indonesia</i>	X	X	<i>Tunisia</i>	X	X
<i>Iran. Islamic Rep.</i>	X	X	<i>Turkey</i>	X	X
<i>Iraq</i>	X	X	<i>Uganda</i>	X	X
<i>Ireland</i>	X	X	<i>United Arab Emirates</i>	X	
<i>Israel</i>	X		<i>United Kingdom</i>	X	X
<i>Italy</i>	X	X	<i>United States</i>	X	X
<i>Jamaica</i>	X	X	<i>Uruguay</i>	X	X
<i>Japan</i>	X	X	<i>Venezuela. RB</i>	X	X
<i>Jordan</i>	X		<i>Vietnam</i>	X	
<i>Kenya</i>	X	X	<i>Yemen. Rep.</i>	X	

Table A1. contd.

<i>Country</i>	<i>Our sample</i>	<i>Restricted Sample</i>	<i>Country</i>	<i>Our sample</i>	<i>Restricted Sample</i>
<i>Korea. Dem. Rep.</i>	X		<i>Zambia</i>	X	
<i>Korea. Rep.</i>	X		<i>Zimbabwe</i>	X	X
<i>Kuwait</i>	X				

GDP per capita

A long detailed data appendix is available from the authors. In broad terms the data are constructed as follows. Maddison (2006) and its latest available update (Bolt and van Zanden, 2013) is the main source of data. Missing data are interpolated using geometric growth rates. We complement these data with real GDP per capita from the Penn World Tables version 7.1 (Heston, Summers and Aten, 2012), the World Bank's World Development Indicators (WDI) database, and The Conference Board Total Economy Database (CBTED). Post-1870 data for African nations are based on de la Escosura (2012). Missing data are backdated using urbanization rates and historical records from national sources, as detailed below.

In our very long-run analysis, we use GDP per capita in 1500 from Acemoglu *et al.* (2008).

Democracy

We use the revised combined polity2 score from the Polity IV database Marshall *et al.* (2010). The polity2 score ranges from -10 to 10, where -10 is least democratic and 10 is most democratic. The polity2 score is an aggregate of sub-scores for each of the following regime features: constraints on executive power; competitiveness of political participation; competitiveness of executive recruitment; and openness of executive recruitment. Following Bruckner and Ciccone (2011), we treat interregnum

periods as missing rather than keeping the value of 0 from Marshall *et al.* (2010). In other words, where no regime is prevalent in a given country-year, we treat the democracy score as missing rather than neutral. For ease of interpretation, we re-scale the polity2 score between 0 and 1.

Linguistic Distance

The raw data for the linguistic distance weight was obtained from Fearon (2003) who retrieved the original data from Ethnologue (Lewis, 2009). Ethnologue is the largest collection of the linguistic lineage for 6,909 living languages in the world. The linguistic lineage takes the form of a language tree where every language belongs to a bigger language family (i.e. Indo-European, Afro-Asiatic) and can then be characterized by a number of different nodes. For example, English has a linguistic lineage with 5 nodes: Indo-European, Germanic, West, English, English. The distance between two languages can be calculated using the number of common nodes shared between each pair of language. Applying the formula from Putterman and Weil (2010), the distance between languages m and n , d_{mn} can be calculated by

$$d_{mn} = 1 - \left(\frac{\# \text{ of common nodes between } m \text{ and } n}{0.5 \times (\# \text{ of nodes of } m + \# \text{ of nodes of } n)} \right)^\lambda$$

Following Fearon (2003), we use $\lambda=0.5$.

Democracy in Neighboring Countries (Dem^F), Language-Weighted

For a given year, let C be the set of all countries in the sample for which we have democracy data. We instrument $Dem_{i,t}$, the level of democracy in country i at time t , with the language-weighted average of the remaining countries in the rest of the world, Z , where Z is $C \setminus \{i\}$.

We use Putterman and Weil's (2010) formula to calculate the linguistic distance $d_{i,j}$ between two countries. We therefore form the instrument, neighbouring countries' democracy weighted by language as follows:

$$Dem_{i,t}^F = \frac{1}{\sum_{j=1}^Z d_{i,j}} \sum_{j=1}^Z Dem_{j,t} \times d_{i,j}$$

Human Capital: Secondary Attainment and Literacy

Secondary educational attainment (*SecEdu*) is from Morrisson and Murtin (2009).

Literacy is measured by the literacy rate in the overall population. We collected literacy data as far back as available for 141 countries: from 1900 for 123 countries and from varying dates prior to 1900 for 18 countries. The breakdown is as follows:

From 1900:

<i>Afghanistan</i>	<i>El Salvador</i>	<i>Liberia</i>	<i>Singapore</i>
<i>Albania</i>	<i>Equatorial Guinea</i>	<i>Libya</i>	<i>Solomon Islands</i>
<i>Algeria</i>	<i>Estonia</i>	<i>Lithuania</i>	<i>Somalia</i>
<i>Angola</i>	<i>Fiji</i>	<i>Madagascar</i>	<i>South Africa</i>
<i>Argentina</i>	<i>Finland</i>	<i>Malawi</i>	<i>Spain</i>
<i>Bahrain</i>	<i>France</i>	<i>Malaysia</i>	<i>Sri Lanka</i>
<i>Bangladesh</i>	<i>Gabon</i>	<i>Mali</i>	<i>Sudan</i>
<i>Benin</i>	<i>Gambia. The</i>	<i>Mauritania</i>	<i>Swaziland</i>
<i>Bhutan</i>	<i>Ghana</i>	<i>Mauritius</i>	<i>Syrian Arab Republic</i>
<i>Bolivia</i>	<i>Greece</i>	<i>Mongolia</i>	<i>Taiwan, China</i>
<i>Botswana</i>	<i>Guatemala</i>	<i>Morocco</i>	<i>Tanzania</i>
<i>Brazil</i>	<i>Guinea</i>	<i>Mozambique</i>	<i>Thailand</i>
<i>Bulgaria</i>	<i>Guinea-Bissau</i>	<i>Myanmar</i>	<i>Togo</i>
<i>Burkina Faso</i>	<i>Guyana</i>	<i>Namibia</i>	<i>Trinidad and Tobago</i>
<i>Burundi</i>	<i>Haiti</i>	<i>Nepal</i>	<i>Tunisia</i>
<i>Cambodia</i>	<i>Honduras</i>	<i>Nicaragua</i>	<i>Turkey</i>
<i>Cameroon</i>	<i>Hungary</i>	<i>Niger</i>	<i>Uganda</i>
<i>Canada</i>	<i>India</i>	<i>Nigeria</i>	<i>United Arab Emirates</i>

<i>Cape Verde</i>	<i>Indonesia</i>	<i>Oman</i>	<i>Uruguay</i>
<i>Central African Republic</i>	<i>Iran. Islamic Rep.</i>	<i>Pakistan</i>	<i>Venezuela. RB</i>
<i>Chad</i>	<i>Iraq</i>	<i>Panama</i>	<i>Vietnam</i>
<i>Chile</i>	<i>Israel</i>	<i>Papua New Guinea</i>	<i>Yemen. Rep.</i>
<i>China</i>	<i>Jamaica</i>	<i>Paraguay</i>	<i>Zambia</i>
<i>Colombia</i>	<i>Japan</i>	<i>Peru</i>	<i>Zimbabwe</i>
<i>Comoros</i>	<i>Jordan</i>	<i>Philippines</i>	
<i>Congo. Dem. Rep.</i>	<i>Kenya</i>	<i>Poland</i>	
<i>Congo. Rep.</i>	<i>Korea. Dem. Rep.</i>	<i>Portugal</i>	
<i>Costa Rica</i>	<i>Korea. Rep.</i>	<i>Qatar</i>	
<i>Cote d'Ivoire</i>	<i>Kuwait</i>	<i>Russian Federation</i>	
<i>Cyprus</i>	<i>Lao PDR</i>	<i>Rwanda</i>	
<i>Djibouti</i>	<i>Latvia</i>	<i>Saudi Arabia</i>	
<i>Dominican Republic</i>	<i>Lebanon</i>	<i>Senegal</i>	
<i>Ecuador</i>	<i>Lesotho</i>	<i>Sierra Leone</i>	

Pre-1900:

<u>Country</u>	<u>Year first available</u>
<i>Australia</i>	1861
<i>Austria</i>	1830
<i>Belgium</i>	1870
<i>Cuba</i>	1899
<i>Denmark</i>	1873
<i>Egypt</i>	1899
<i>Germany</i>	1830
<i>Ireland</i>	1851
<i>Italy</i>	1871
<i>Mexico</i>	1895
<i>Netherlands</i>	1820
<i>New Zealand</i>	1861
<i>Norway</i>	1873
<i>Romania</i>	1899
<i>Sweden</i>	1873
<i>Switzerland</i>	1830
<i>United Kingdom</i>	1820
<i>United States</i>	1870

Literacy

The data are mostly from censuses and, therefore, are mostly available in 10-year intervals. The data are interpolated geometrically. The following sources are used: Allen (1991), Flora *et al.* (1983), Flora (1975), Hunter *et al.* (1891), Graff (1987), Schofield (1973), Snyder (1993), UNDP (2011), UNESCO (1953, 1957, 1977) and the UNESCO Institute for Statistics (2005).

Leader Death

The leader death variable is a binary indicator equal to 1 if the country has experienced a leader death or exit due to ill health in the preceding decade, and 0 otherwise. Goemans, Gleditsch and Chiozza (2009) constructed Archigos, a database of political leadership identifying, among many other things, the effective leader in each country-year observed. Archigos also provides reasons for the exit of each leader. For a given country, our leader death variable is equal to 1 if in the preceding decade, Archigos lists one or more leaders leaving office due to death or other negative health shock.

Archigos provides leadership information as far back as 1875 for some countries. We extend this data collection effort backwards using various works accessed on Google Books and identify 22 previously undocumented leader deaths in the 1820-1875 period. These deaths are listed in the table below.

Country	Leader name	Exit year	Cause of exit	Source
Chile	Ovalle	1831	Tuberculosis	Barros Arana (2000)
Denmark	Frederick VI	1839	Undetermined illness	Urban (1840)
Denmark	Christian VIII	1848	Sepsis	Christensen (2013)
Denmark	Rotwitt	1860	Undetermined sudden illness	Bille (1876)
Turkey	Mahmud II	1839	Tuberculosis	Ágoston and Masters (2009)
Turkey	Abdülmeceid I	1861	Tuberculosis	Akgündüz and Öztürk (2011)
Iran	Mohammad	1848	Gout	Amanat (1997), p. 89
Portugal	Maria II	1853	Childbirth	Encyclopaedia Britannica
Mexico	Barragán	1836	Stepped down due to grave illness	Filisola (1849)
USA	Harrison	1841	Pneumonia	Freidel and Sidey (2006)

France	Louis XVIII	1824	Gangrene and other illnesses	Highley (1830), p. 264
Japan	Ninkō	1846	Undetermined sudden illness	Keene (2013)
USA	Taylor	1850	Cholera morbus	Miller Center at the University of Virginia
Portugal	Pedro V	1861	Typhus	New York Times (1861)
Spain	Ferdinand VII	1833	Undetermined illness	Oyarzun (2008)
Morocco	Slimane	1822	Unknown; plague present in country at death	Panzac (2005)
Morocco	Abderrahmane	1859	Old age (81)	The Authors
Thailand	Rama III	1851	Unknown; old age (63); no conspiracy allegations	The Authors
Thailand	Rama IV	1868	Malaria	van Helden, Dupré and van Gent (2010)
Iran	Fath-Ali Shah Qajar	1834	Unknown; old age (63); no conspiracy allegations	The Authors
Sweden	Charles XIV	1844	Stroke	Maierhofer, Roesch and Bland (2007)
Sweden	Oscar I	1857	Too ill to govern until his death in 1959, son Karl XV acted as regent	Scobbie (2010)

Distance to the Technology Frontier

At time t , the distance to the technology frontier $DTF_{i,t}$ for country i is given by:

$$DTF_{i,t} = \frac{\text{Per capita GDP}_{i,t}}{\text{Per capita GDP}_{j,t}}$$

where j denotes the technology frontier. We take the United Kingdom as the frontier for all observations prior to and inclusive of the year 1900, and the United States as the frontier for all later time periods.

Genetic Distance

Data on Genetic Distance is taken from Spolaore and Wacziarg (2009). Refer to Spolaore and Wacziarg (2009) for a detailed description of the measure.

Inverse Geographic Distance

The inverse distance (in kilometers) between the most populated cities of the two countries in a dyad. The data stems from the CEPII database (Mayer and Zignago 2011).

Human Capital in the very long run: Years since first university established

For each country in our sample, we researched the year of establishment of the oldest university. The table below lists the oldest university by country and its year of creation, provided the oldest university was created prior to 1900. Countries that are included in our sample but absent from the table below did not have any universities in 1900.

We compiled these data from numerous sources including Encyclopaedia Britannica, university websites, works accessed on Google Books (with the exception of Porter, 2003) and other sources. A comprehensive reference list is provided at the end of this appendix.

Country	Year first university established	University name	Source
Algeria	1857	University of Algiers	Zezeza (2006)
Argentina	1613	National University of Córdoba	National University of Córdoba
Australia	1850	University of Sydney	University of Sydney
Austria	1365	University of Vienna	University of Vienna
Belgium	1425	KU Leuven	KU Leuven
Bolivia	1624	Royal and Pontifical Major University of St. Francis Xavier	McGurn Centellas (2008)
Bulgaria	1888	University of Sofia	University of Sofia
Canada	1663	Université Laval	Encyclopaedia Britannica
Chile	1842	Universidad de Chile	Universidad de Chile
China	1898	University of Peking	Wang (2010)
Colombia	1580	Saint Thomas Aquinas University	Saint Thomas Aquinas University
Costa Rica	1843	Universidad de Santo Tomas	Universidad de Santo Tomas

Cuba	1728	Universidad de La Habana	Marist College
Denmark	1479	University of Copenhagen	OECD (2005)
Dominican Republic	1538	Autonomous University of Santo Domingo	Encyclopaedia Britannica
Ecuador	1589	Central University of Ecuador	El Comercio (2011)
Egypt. Arab Rep.	988	Al-Azhar University	Encyclopaedia Britannica
El Salvador	1841	University of El Salvador	Encyclopaedia Britannica
Estonia	1632	University of Tartu	Katsirikou and Skiadas (2010)
Finland	1640	University of Helsinki	University of Helsinki
France	1150	University of Paris	Hipple (2009)
Germany	1386	Ruprecht Karl University of Heidelberg	Ruprecht Karl University of Heidelberg
Greece	1837	University of Athens	King (2004)
Guatemala	1676	Universidad de San Carlos de Guatemala	Encyclopaedia Britannica
Honduras	1847	Universidad Nacional Autónoma de Honduras	Dye and Tyler (1986)
Hungary	1635	Eötvös Loránd University	Kaplan and Baldauf (2005)
India	1818	Serampore College	Serampore College
Ireland	1592	Trinity College (University of Dublin)	Thompson (2003)
Italy	1088	University of Bologna	University of Bologna
Japan	1858	Keio University	Cassman (2007)
Korea. Rep.	1398	Sung Kyun University	Hoobler and Hoobler (2009)
Lebanon	1886	American University of Beirut	Gockel and Bruns (1998)
Lithuania	1579	Vilnius University	World of Information (2003)
Madagascar	1896	Antananarivo Medical Training Academy	Zezeza (2006)

Mexico	1551	National University of Mexico	Kalman (2008)
Morocco	859	University of Al-Karaouine	Hipple (2009)
Netherlands	1575	University of Leiden	Devine and Summerfield (2013)
New Zealand	1869	University of Otago	Edition XII (1996)
Nicaragua	1812	National Autonomous University	Encyclopaedia Britannica
Norway	1811	University of Oslo	Norway: The Official Site in the United States
Pakistan	1882	University of the Punjab	Tikekar (2004)
Paraguay	1890	National University of Asunción	Encyclopaedia Britannica
Peru	1551	Universidad San Marcos	Dodson (2009)
Philippines	1611	University of Santo Tomas	Altbach and Hoshino (1995)
Poland	1364	Jagiellonian University	Lerski (1996)
Portugal	1290	University of Coimbra	Pease-Watkin and Schofield (2012)
Romania	1860	University of Jassy	Andrea (2006)
Russian Federation	1724	St. Petersburg University	Bain (2003)
Serbia	1863	University of Belgrade	Encyclopaedia Britannica
Sierra Leone	1827	Fourah Bay College	Jalloh and Falola (2008)
South Africa	1873	University of South Africa	Rosenthal (2013)
Spain	1218	University of Salamanca	Faiella (2004)
Sweden	1477	University of Uppsala	Gan, Fun and Jermyn (2003)
Switzerland	1460	University of Basel	Moeller <i>et al.</i> (2012)
Tunisia	737	Ez-Zitouna University	Porter (2003)
Turkey	1453	University of Istanbul	Vedel (1980)

United Kingdom	1167	Oxford University	Oxford University
United States	1636	Harvard University	Devine and Summerfield (2013)
Uruguay	1849	University of the Republic	Encyclopaedia Britannica
Venezuela. RB	1721	Central University of Venezuela	Patil (2012)

Very Long-Run Variables: 1500-2000

Democracy in the year 2000 is from the Polity IV project (Marshall *et al.*, 2010). The literacy rate in 1900 is from the author's own research as referenced below. The years of independence, constraints on the executive at independence, the fractions of the population of Catholic, Muslim, and Protestant faiths, and GDP per capita in the year 1500 are all from Acemoglu *et al.* (2008).

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