COMPARATIVE ECONOMICS IN HISTORICAL PERSPECTIVE.[*]

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Abstract: This paper presents evidence showing that there have been since antiquity two opposed types of institutional systems: one resembling central planning and present in ancient China, ancient Egypt, the Inca Empire and other territorial states, and another one with strong market institutions, protection of property rights present mostly in city-states not just in the Mediterranean but throughout the world. A new database documenting these diverse institutional clusters from the antiquity is described and their links analyzed.

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[1] See Finer (1997) for the most complete description of political institutions so far.

1. Introduction

Traditionally, comparative economics is thought of mostly as a 20th century subject founded to focus on the comparison between the capitalist and the socialist economic systems. The socialist system is generally seen as a 20th century phenomenon that appears inseparable from Marxist ideology that advocated nationalization of the means of production and replacement of the market by central planning as a resource allocation mechanism. This gives the impression that the emergence of these two systems appeared only as a consequence of industrialization. Humanity experienced in the twentieth century with socialism, and it failed dramatically. However, if we go back in history, a long time before industrialization, at the time of formation of the first states, we will find differences between economic systems that are as stark as those studied by comparative economics focusing on the twentieth century.

Looking more closely at the ancient world, we find that some systems (Egypt, China, Peru under the Incas and others) were more like centrally planned economies. There was no private property of land (the land belonged to the Emperor or ruler), agricultural goods and craft goods were allocated by the government. Markets were hardly developed and foreign trade was under the control of government. Following Roland (2018) I will call them **statist systems**. Other economies, like ancient Mesopotamia, Athens, the Aztecs in Mexico, the Champa (covering roughly today's South Vietnam) were more clearly market economies with private property of land and developed markets, both domestically and internationnally. I will call them **market systems**. Many other systems were in between both these systems, as documented below.

These differences have been noted before. Max Weber (1922) used the term of *patrimonial state* to characterize states like Ancient China and others where the absolute domination of the father figure in a family is projected onto the state. Private and public property are blended in the patrimonial state. Wittfogel (1957) theorized about oriental despotism and hypothesized that the absolutist rule in ancient China and Egypt was based on the facilitation by absolutist rulers of what he called the hydraulic state where the state organized large scale irrigation systems, creating ideal conditions for bureaucratic and government despotism.[1] Polanyi and coauthors (1954) documented the limited role of markets where private goods were exchanged in the Antiquity. Trigger (2003) provides a very interesting classification of ancient societies, based on archeological evidence. He emphasizes mostly the difference between territorial states and city-states but his classification is quite comprehensive and based on extensive scholarly evidence. British historian MacFarlane (1978) found that as early as the 13th century, individualist culture was more prevalent in England compared to the European continent and that households tended to be more nuclear, relying more on the market in economic transactions than societies where people were embedded in larger clans.

[1] See Finer (1997) for the most complete description of political institutions so far.

Among economists, Greif and Tabellini (2017) analyze the relative importance of clans in formation of cities in China and Europe. They find that in Chinese history, the development of cities was based on clans and clan organization, which has played an extended role in Chinese history. In contrast, cities in Western Europe developed on the basis of individual citizenship.[2] They trace these differences to cultural differences: generalized morality in Europe versus limited morality within the clan in China. Mayshar et al. (2017) emphasize the role of transparency in production. Whenever output could easily be measured, peasants worked directly for the state, as was the case in ancient Egypt. When output was instead less transparent, peasants had property rights over land like in Mesopotamia.

In this paper, I present a database based on historical and archeological research to characterize the major differences between statist systems and market systems in the antiquity and periods of early state formation. The evidence we present shows clearly that these two systems form distinct institutional clusters that are comparable to the difference between socialism and capitalism in the twentieth century. These different systems operated in mostly rural societies where modern industrial technology was absent and where labor (in particular slave labor) and land were the major factors of production.

Interestingly, we find different legal arrangements relative to these two factors of production. In market systems, there was private property of land but also of slaves. In statist systems, slaves were also used extensively, but they worked for the state. Households did not have the right to buy and sell slaves and there were no private markets for slaves. In statist systems, land was owned by the state and there was no market for land. In market systems, legal systems were designed to deal with horizontal conflicts between citizens, in particular over property right disputes. In statist systems, the law was essentially a tool for the ruler to oppress citizens, as in China's "legalist" doctrine developed during the Qin dynasty.

There were also marked differences in political institutions in market versus statist systems. Market systems were often organized in city-states, like in Mesopotamia, ancient Greece and Rome, the Champa Empire in South Vietnam or the Aztec city-states in Mexico. Statist systems, in contrast, were usually organized in territorial states like ancient Egypt, China, or the Inca Empire. The latter were also much more centralized and had less developed cities, except for administrative centers.

As a consequence of these legal and political institutions, trade of private goods, within and across polities, was much more developed in market systems

[2] Keightley (2013) documents much earlier periods than Greif and Tabellini, describing clearly institutions in as early as the Shang dynasty.

compared to statist systems. There were also important sociological differences, some a consequence of institutional differences, others more a source of those differences. The role of merchants was much more recognized in market systems compared to statist systems. There was also more ethnic diversity and tolerance towards foreigners. Differences in kinship systems were also quite notable (see also Enke, 2018). One was more likely to observe market systems in places with bilineal kinship systems, and instead statist systems in places with unilineal kinship systems. Unilineal kinship systems trace ancestry through only one parent (usually the father, i.e. patrilineal systems, but sometimes also the mother with matrilineal systems) whereas bilineal systems trace ancestry through both parents. Since unilineal kinship systems traces ancestry only through one line, many people know that they share unequivocally the same ancestor, which makes it easy to define somebody's belonging to a clan. It is thus not surprising to see that clans were much stronger in societies with unilineal kinship systems. Strength of clan also affects the strength of market development. In societies with strong clans, a lot of economic activities were done inside the clan, on the basis of division of tasks within the clan. In societies with weaker clans, people needed to resort more to the market for their production and consumption.

This paper describes in detail the institutional part of the data base we have built over the last few years, and how the different variables relate to each other. In a companion paper (Roland, 2018), I examine the relationship between these institutional clusters and the major cultural divide in the modern world between individualist cultures, present mostly in the West, but also for example in India and the Middle East, and collectivist culture, present mostly in Asia, but also for example in the Andes region in Latin America and parts of Africa.

In section 2, we explain the choices we made in terms of the time periods for data collection, In section 3, we describe our scoring choices for the variables on which we collected data. In section 4, we document the presence of institutional clusters showing the presence of different institutional systems in ancient times. In section 5, we show that these institutional clusters are associated with the extent of market and trade activities. Section 6 concludes.

2. Choices to Make in Gathering Data on Comparative Historical Institutions

Using extensive historical and archeological sources, we collected data on a number of variables for 97 countries. The country list is not exhaustive. We restricted ourselves to the list of countries for which we have Hofstede individualism/collectivism scores, since the primary aim of our research is to understand how ancient institutional systems still affect modern culture, i.e. values and beliefs (see Roland, 2018). In this paper, we present data based on the first

two revisions of the data, but we are constantly updating the database to improve accuracy, and will be working on further revisions.

This first data collection is based uniquely on the reading of historical and archeological scholarly sources on the topic. Needless to say, this involves a huge effort in the collection of historical information. In doing this data collection, we had to make several choices.

A first choice we had to make was on the exact time period to focus on for the data collection for each country. The basic choice we made was to choose the oldest period of early civilization for which we have historical and archeological sources. This usually coincides with ancient state formation, but not always.[3] Since there is a relative invariance in institutional characteristics, especially at the time of the formation of ancient civilizations, we can be confident that we are measuring variables that had a certain degree of persistence. There is of course no absolute time invariance on all variables, but it is nevertheless quite strong when we consider all variables together. This time choice was relatively straightforward in most cases, as these ancient civilizations affected future historical developments. This is obvious for example in the case of China, ancient Rome or ancient Greece. It is not obvious at all for ancient Egypt, the longest lasting ancient civilization, that was not only wiped out two thousand years ago, but that does not seem to have left many traces in contemporary Egypt. One might argue in that case that later periods might be more relevant. It would, in our view, however be arbitrary to do things this way, and this approach to data selection would bias our data collection towards finding strong persistence of early institutions. We think it is more transparent to look as far as possible in history to understand the emergence of particular institutional clusters and their historical impact. In some cases, not only have ancient civilizations disappeared, but their ancient populations were replaced by new and completely different populations. This is the case for example with British colonies in the United States, Australia, Canada and New Zealand, where immigration and the quasi-elimination of indigenous populations by the new migrants profoundly transformed those countries. For those countries, we simply used the institutional data we have for the UK since this is the largest origin of the migrants. Similarly, for Singapore, we used the data from China. Country composition of migrants thus played an important role in our choice of time period for a country. A choice that is potentially more controversial is the choice of the post-Tatar Duchy of Muscowy for Russia. Russian historiography always emphasizes Kievan Rus as the cradle of Russian civilization, but this has become more and more controversial over time. We think our choice is reasonable since tsarist Russia really started to develop only after the elimination of the Tatar yoke, and our data collection exercise confirms that the Tatars left a deep influence on Russia's institutions.

[3] For example, the Philippines did not really have state formation before Spanish colonization. This is also the case for some African tribes.

A second issue has to do with the absence of overlap between current country boundaries and ancient boundaries. If ancient boundaries are larger than the current ones, there is no problem. The problem arises when ancient boundaries were smaller than the current ones. This is mostly the case for some big countries. The most obvious case is India. Here, we collected data on the institutions of three ancient empires/kingdoms: the Mauryan Empire (322 BCE-185 BCE) that covered mostly Northern India but expanded most to the South under Emperor Ashoka; the Bengal Kingdom that straddled current Bangla Desh and current West Bengal in India, as well as the Tamil kingdoms. Similarly, the current territory of South Vietnam overlapped for a very long time with the Champa Empire (27 BCE-1453 CE), while North Vietnam was part of China for more than thousand years.

A third issue has to do with the fact that in some cases, there have been multiple influences. We tried to avoid as much as possible to choose multiple time periods in history, but in some cases it was impossible to do otherwise. The most obvious case is that of Latin America. On one hand, important ancient civilizations had developed there, which are impossible to ignore: the Inca and their predecessors in the Andes region, the Aztec in Central Mexico and the Maya around the Yucatan peninsula. On the other hand, Spanish colonization lasted roughly 500 years and had an enormous influence on Latin America. In some cases, the influence of the Spanish was predominant as they occupied territories inhabited by tribes that had not yet reached statehood, that died out or were exterminated to a large extent, and for which we have very little information. Again the population criterion played an important role here. The Philippine tribes had not yet reached statehood by the time of Spanish colonization, but the autochtonous population remained very large, so we took their influence into account. A choice that may appear controversial is that we did not take into account any colonial influence in Africa, except for South Africa colonized by the Boers. Indeed, the colonial era in Africa has been much shorter (roughly only 100 years) than in Latin America and one can argue that colonial powers in Africa did not leave an imprint as big as the Spanish (or the Portuguese) in Latin America.

Table 1 indicates the time period chosen for every country as well as the broad time period covered by the institutions under scrutiny.

Table 1. Time period choice for the analysis.

Country	**Time period(s)**
Albania	Ottoman Albania (1385-1912)
Angola	Pre-colonial kingdoms: Kongo Kingdom (1390-1857), Ndongo Kingdom, Matamba Kingdom
Argentina	Spanish colony early 16th century (1516)-1816
Australia	British colony (1788-1850)
Austria	Germanic tribes (1st century to 6th century)
Bangladesh	Bengal (5th century BC- 6th century AD)

Belgium	- Ancient Rome (22BC-5th century) - Independent cities (1100s-1600s)
Bhutan	Pre-modern Bhutan Theocracy government (Early 17th century-1907)
Brazil	Portuguese colony (16th century (1500)-1822)
Bulgaria	- First Bulgarian Empire (618-1018) - Second Bulgarian Empire (1185-1396) - Ottoman Bulgaria (1396-1878)
Burkina Faso	Pre-colonial Mossi States (16th century-1896)
Canada	English colony after 1763
Chile	- Inca Empire (1438-1533) - Spanish colony (1541-1810)
China	Shang Dynasty (c. 1600 BC- c. 1046 BC) Western Zhou Dynasty (c. 1046 BC-771 BC)
Colombia	- Inca Empire (1438-1533) - Spanish Colony (early 16th century (1525)-1810)
Costa Rica	Spanish Colony (early 16th century (1524)-1810)
Croatia	- Ancient Rome (1st century AD-476AD) - Duchy, Kingdom of Croatia (8th century-925-1102, Frankish vassal) - Republic of Ragusa (Dubrovnik, 13th-19th century)
Czech Republic	Bohemia (Přemyslids) (867-1306)
Denmark	The Vikings (8th century-mid-11th century)
Dominican Republic	Spanish Colony (1492-1795)
Ecuador	Inca Empire (1438-1533), Incan Conquest of Ecuador, 1463-1500 Spanish colony (1534-1822)
Egypt	Ancient Egypt (3150 BC-525 BC)
El Salvador	Spanish Colony (1525-1821)
Estonia	Estonian tribes (8th century-13th century, before the Crusade)
Ethiopia	Kingdom of Axum (c. 100- c.900)
Fiji	British Colony (1874-1970)
Finland	Finn tribes (8th century-13th century, before Christianization)
France	- Ancient Rome (509 BC-476 AD) - The Franks (3rd century AD-7th century AD)
Germany	Germanic tribes (1st century to 6th century AD)
Greece	Classical Greece (510BC-323BC)
Ghana	Ashanti Confederacy (mid-17th century-1902)
Guatemala	- Mayan city-states (c. 250 AD- 16th century) - Spanish colony 1524-1821
Honduras	- Maya city-states (c. 250 AD- 16th century)

	- Spanish colony 1526-1821
Hungary	Arpad Dynasty (c. 895-1301)
Iceland	Icelandic Free State (Vikings) (c. 930-1262)
India	- Mauryan Empire (326 BC-180 BC) - Tamil kingdoms (4th century BC-5th century AD) - Bengal (5th century BC-6th century AD)
Indonesia	Early Indianized Kingdoms (1st century AD -1377 AD, end of Srivijaya)
Iran	Achaemenid Empire (550 BC-330 BC)
Iraq	Assyria, Mesopotamia (c. 3000 BC-539 BC)
Ireland	Irish Kingdoms (5th century-9th century)
Israel	Ancient Israel (c. 1000 BC- 586 BC, end of Kingdom of Judah)
Italy	Ancient Rome (509 BC-476 AD)
Jamaica	Spanish Colony (1494-1655) British Colony (1655-1962)
Japan	Yamato and Asuka Japan (c.250-710)
Kenya	Swahili city-states (8th century or 9th century-16th century) Kikuyu tribes (3d-13th century)
Korea	Old Choson (3rd century BC-108 BC)
Kuwait	Mesopotamia (c. 3000 BC-539 BC)
Latvia	Medieval Livonia (Bishoprics, archbishopric of Livonia, Livonian Order, Municipal City of Riga) (13th century-16th century)
Lebanon	Phoenicia (c. 1500BC- 539 BC)
Libya	Same as Saudi Arabia
Lithuania	Grand Duchy of Lithuania (c. 1236-1569)
Luxembourg	Germanic tribes (1st century to 6th century)
Malawi	Pre-colonial kingdoms (17th century-19th century)
Malaysia	Early Indianized Kingdoms (1st century AD-1377 AD, end of Srivijaya)
Mexico	- Maya city-states (c. 800 BC-c. 1600 AD) - Aztec Empire (1428-1521) - Spanish colony (1521-1821)
Morocco	Berber Morocco Dynasties: Idrisid Dynasty (788-974) Almoravid Dynasty (1040-1147) Almohad Dynasty (1121-1269)
Mozambique	Portuguese Colony (1498-1975)
Namibia	German colony (1884-1915)
Nepal	Licchavi Kingdom (c. 400AD -879 AD)
Netherlands	Germanic tribes (1st century to 6th century) Independent cities (1100s-1600s)
New Zealand	British colony (1841-1907)
Nigeria	Yoruba states (1300s-1896)
Norway	Viking Age (8th century-mid-11th century)

Pakistan	Ghaznavid Empire 977-1186 Ghurid Empire 1186-1215
Panama	Spanish Colony (1510-1821)
Peru	- Inca Empire (1438-1533) - Spanish colony (1534-1821)
Philippines	- Pre-colonial Philippines (900-1565) - Spanish Colony (1565-1898)
Poland	Piast Dynasty (c. 960-1370)
Portugal	Medieval Kingdom of Portugal (1139-15th century)
Romania	Ancient Rome (Roman Dacia) (106 AD-271 AD) Medieval: Transylvania (Hungary), Principalities of Moldavia and Wallachia (in 14th century-16th century)
Russia	Muscovy (1283-1584)
Saudi Arabia	Arab tribes (early 7th century), Rashidun Caliphate (632-661), Umayyad Caliphate (661-750)
Senegal	Pre-colonial states and kingdoms (Bundu and Gajaaga states, Wolof kingdoms, Fulani Futa Toro) (1600s-1885)
Serbia	Nemanjić dynasty (1166-1371) Ottoman Serbia (14th or 15th century-1817)
Sierra Leone	The Temne and the Mende states (17th century? –before the 20th century) British colony (1808-1961)
Singapore	- China - Malaysia
Slovakia	Same as Hungary
Slovenia	Ancient Rome + Slav tribes
South Africa	Dutch Cape Colony (1652-1795)
Spain	- Reconquista Castile (1065)-Leon(910); Crown of Castile (1230-1492) (1492: end of Reconquista) - Aragon (est. 1035) - Catalonia (12th century-15th century)
Sri Lanka	Ancient Sri Lanka (Anuradhapura Kingdom) (377BC-1017)
Sweden	Viking Age (8th century-mid-11th century)
Switzerland	Germanic tribes Germanic tribes (1st century to 6th century)
Syria	Assyria, Mesopotamia (c. 3000 BC-539 BC)
Taiwan	China
Tanzania	Swahili city-states (8th century or 9th century-16th century) Sukuma tribes (14th -19th century)
Thailand	Dvaravati Kingdoms (6th century-13th century)
Trinidad and Tobago	Colony (1498-early 19th century)
Turkey	Seljuk Rum Sultanate (1077-1308); Ottoman Empire

	(c.1299-1922) Evidence from early Ottoman Empire.
United Arab Emirates	Arab tribes (early 7th century), Rashidun Caliphate (632-661), Umayyad Caliphate (661-750)
United Kingdom	Anglo-Saxons (5th century- 11th century AD)
United States	British colony (17th century-1776)
Uruguay	Banda Oriental (Spanish Colony and Portuguese Colony) (1624 (First permanent settlement founded Banda Oriental (Spanish Colony and Portuguese Colony) by the Spanish; 1680 Colônia do Sacramento founded by the Portuguese)-c. 1830)
Venezuela	Spanish Colony (1522-1811)
Vietnam	North Vietnam Chinese rule and domination (111BC-938AD) Champa city-states (2nd century-1832)
Zambia	Pre-colonial kingdoms (Lozi, Kazembe, Bemba, 18th -late 19th century)

3. Description of institutional variables.

We now describe the scoring rules we used for the institutional variables we collected. We start with property rights for land. While private ownership rights existed in many countries more or less from the earliest periods of state formation, in other countries, farmers worked on land that did not formally belong to them, but often to the ruler or to the government.

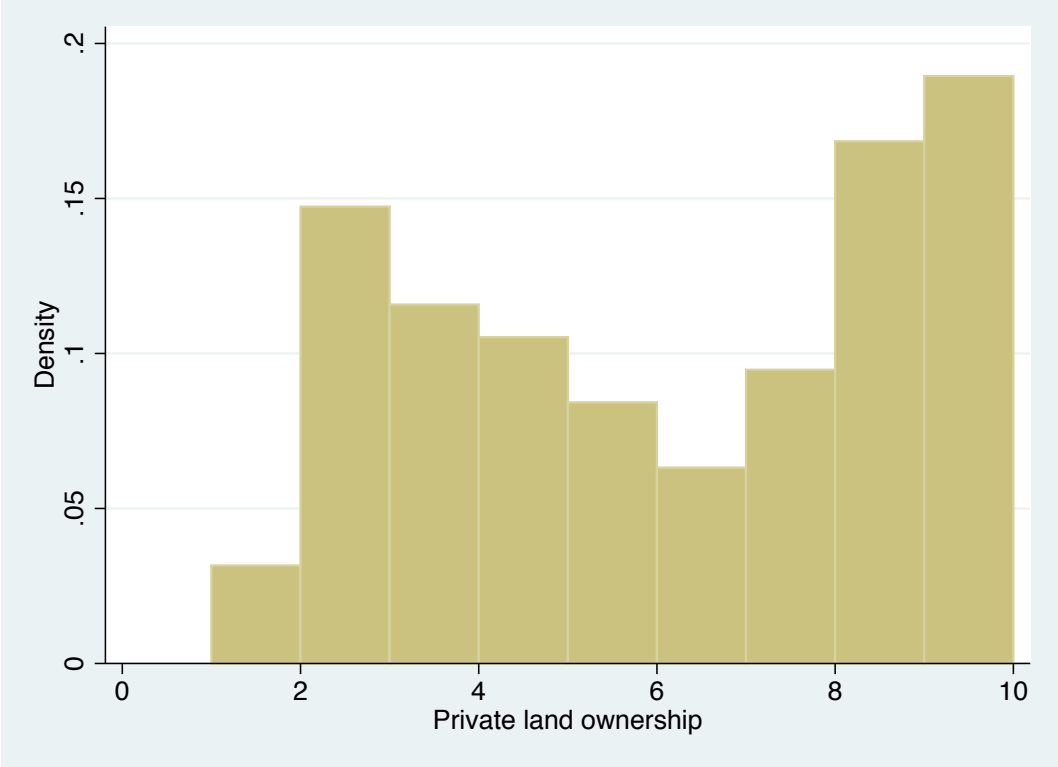
Scores for private land ownership

1: no evidence of private ownership in society, state ownership dominates.
2: no evidence of private ownership in society, state ownership + communal or chief ownership
3: no evidence of private ownership in society, communal ownership dominates.
4: some evidence of private ownership, which coexisted with communal/familial/institutional ownership
5: mixed, limited private ownership
6-7 Private land dominates, cannot be transferred; usufruct rights; not inheritable, reverted to the state after death (iqta, Prazo)
8: Private land dominates: owned by a single person; cannot be transferred. Inheritable but had only usufruct rights.
9 Private land dominates: owned by a single person; limitations on land transaction or little evidence of land transaction (example: land can only be transferred within the clan or kindred); inheritable, an individual can dispose the land at his or her own will.

10: Private land dominates: owned by a single person; strong evidence of land transfer and transaction. Can be inherited, an individual can dispose of the land at his or her own will.

The distribution of land ownership is represented in Figure 1. As we can see, the distribution of land property rights is quite bimodal. There was strong private ownership in roughly a quarter of our sample. Among countries with the highest scores, we have ancient Greece, ancient Rome, the UK (under the Saxons) and Finland and Estonia. Among countries with the lowest scores, we have Egypt, ancient China, Guatemala and Nepal.

Figure 1. Distribution of land ownership



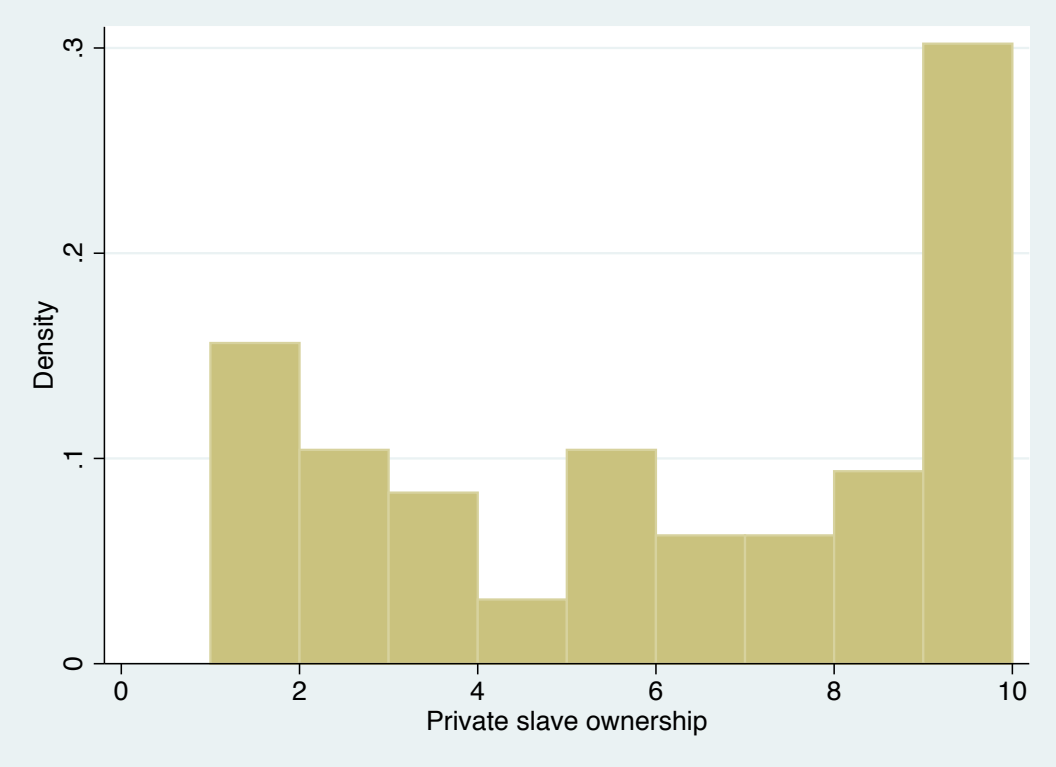
We now describe the scores for private ownership of slaves. All ancient societies had some form of slavery, but these forms varied a lot. While the great pyramids of Egypt and the Great Wall of China were all built with slave labor, slaves in those countries worked nearly exclusively for the state. Private households were not allowed to hold slaves, nor was there a private market to buy and sell slaves, in contrast to what was the case in ancient Greece and ancient Rome for example.

Scores for private ownership of slaves

1: no slaves: serfdom and servants; masters integrated war captives into the clan/ adoption;
2: no private slaves: uncommon for individuals to hold slaves; typically, slaves were war captives; slaves were held by the chief/ruler/king/state and worked for the ruler; absence of slave market and slave trade; communal work or corvee labor replaced slavery in public works
3-4: private slaves existed, yet played a minor part in economic life. Little evidence of slave market and slave trade
5-6: individuals can own slaves; existence of slave market and slave trade; slavery coexisted with serfdom and other forms of labor in society
7-8 slaves were traded in market as property; individuals can own slaves; existence of slave market and slave trade; law defined slaves as objects; slavery played an important economic role in society
9-10: Private slaves slaves were traded in market as property; very common for individuals to own slaves; very active slave market and slave trade; law defined slaves as objects; slavery played a very important economic role in society

As can be seen from Figure 2, a similar pattern as with private land ownership emerges with the distribution of private ownership of slaves. In roughly a third of our sample, there was strong private ownership of slaves, but roughly the same proportion had low scores indicating that slaves were mostly only property of government. Among countries with the highest scores, we have again ancient Greece and Rome, the UK, but also Scandinavian countries and Morocco, Lybia and Saudi Arabia. Among countries with the lowest scores, we have China, Bhutan, Ghana, Korea and Ecuador. Not surprisingly, private land ownership and private ownership are highly correlated, with a correlation coefficient of 0.82.

Figure 2: Distribution of private ownership of slaves.



We now discuss differences in legal systems. The main distinction we make is between systems where the law served to regulate conflicts between citizens, in particular over property issues on one hand, and systems where the law was mostly used as a tool of repression by the ruler on the other hand. We call the former horizontal legal systems and the latter vertical legal systems. The former is related to the modern concept of *rule of law,* while the latter is related to the concept of *rule by law*, as was formulated in ancient China by the doctrine called legalism that was espoused by the first Qin emperor who unified China. In some countries, there was customary law and the distinction between horizontal and vertical law does not fit quite well. When only customary law was present, we gave a lower score depending on how well property was protected. When measuring differences between legal systems, we first used historical references to build scores. In the end, we wanted to be as objective as possible and decided to build an index out of scores for three variables: 1) the presence of property law (out of 3 points), 2) the presence of contract law (also out of 3 points) and 3) the degree of formalization of procedural law (out of 3 points). The description is as follows:

Scores for the legal system.

Property law (scores from 0 to 3):

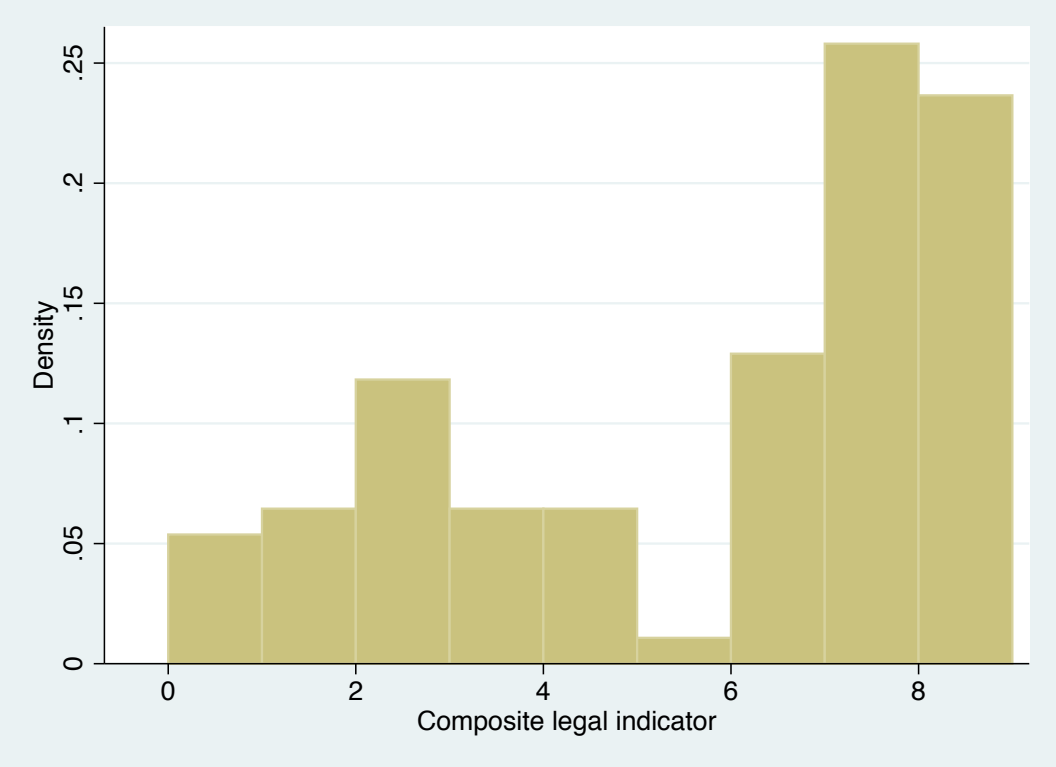
0. No mention of private property nor its protection or no concept of private property. Strong emphasis on punishment of transgressions against state property.
1. No mention of private property nor its protection, or no concept of private property.
2. No explicit mention of protection of private property, but written codes on transfer of property, inheritance of property of individuals and how to solve disputes on property.
3. Written codes on transfer of property, inheritance of property of individuals and how to solve disputes on property and the law also explicitly mentions protection of private property against potential expropriation.

Contract law (score from 0 to 3):
0: no mention of contract in laws
1: unwritten or customary law that has cases related to contract
2: written contract law mentioning cases of contract and enforcement
3: written contract law that has detailed conditions on regulation and enforcement of contract

Comparison of Public law (score between 0 and 3):
0: No procedural law, usually no specific procedure is followed
*Customary law=0 or 1
1: Procedure but little protection
2: Some formalized way of procedure
3: Written procedural law

Not surprisingly, when it comes to the character of the legal system, as measured by our law composite index constructed by adding the variables described above, it is also bimodal, with a large mode at the highest scores, but also at the lowest score. This can be seen in Figure 3. Among countries with the highest scores, we have ancient Greece and ancient Rome, but also Serbia. Among countries with the lowest scores, we have China, Indonesia, Malaysia, Thailand and Vietnam, mostly Asian countries but also Ghana.

Figure 3: Legal systems index.



Different legal institutions should lead to differences in the intensity of development of markets, which should be stronger in market systems. Here we use a measure of the intensity of private trade within a polity, but also a measure of the intensity of trade across polities.

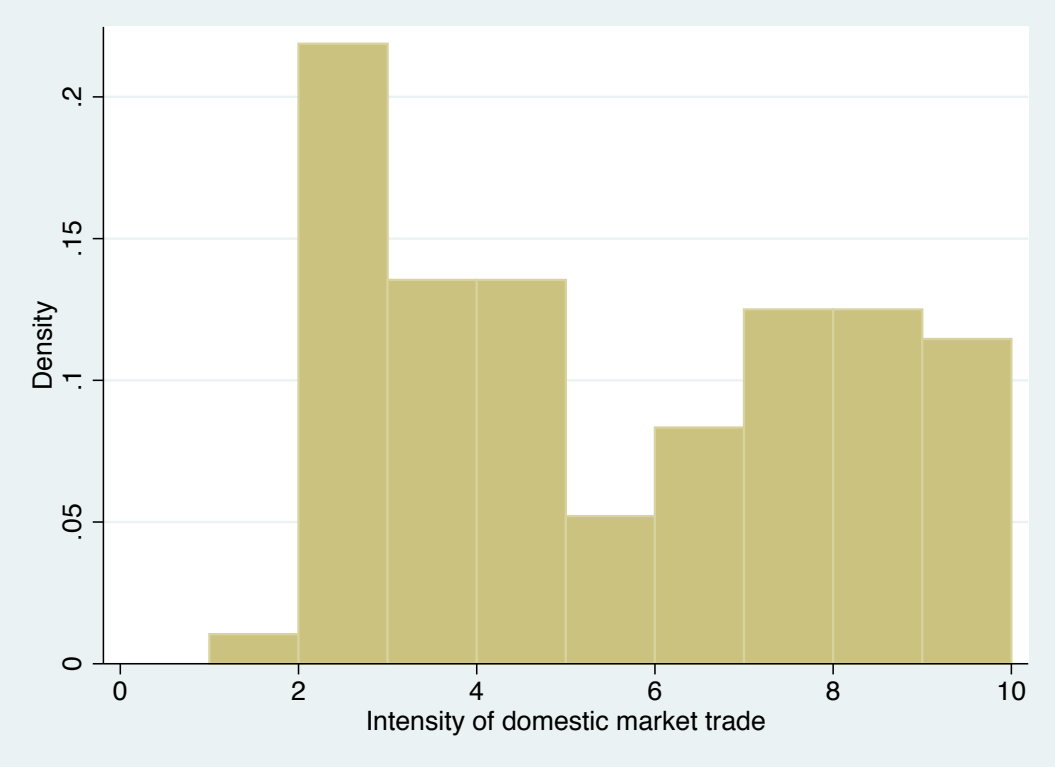
Score for trade within a polity

1-2: No private trade. Mainly distribution via the state apparatus. Some barter.
3-4: Very limited private trade. Distribution and subsistence production.
5-6: Trade limited in scope (goods traded), location and time.
7-8: Active trade with some limits and significant non market activity.
9-10: Intensive internal trade an important engine of the economy, possibly in conjunction with intensive international trade.

As we can see in Figure 4, the distribution of trade intensity within countries is also quite bimodal with nearly a quarter of countries having had very limited private trade, confirming Polanyi's earlier conjecture. Among countries with the lowest scores, we have not only China and ancient Egypt, but many other Asian countries (Bhutan, Nepal, Korea, Japan) as well as countries from Africa and Latin America. Among countries with the highest scores, we have the usual (ancient Greece and Rome, Northern European countries), but also Slovenia. African countries with high scores include Morocco and Libya. Asian countries with high

scores include Saudi Arabia, Indonesia, Malaysia and Pakistan. Latin American countries with the highest scores are Uruguay and Mexico.

Figure 4: Intensity of trade within the polity

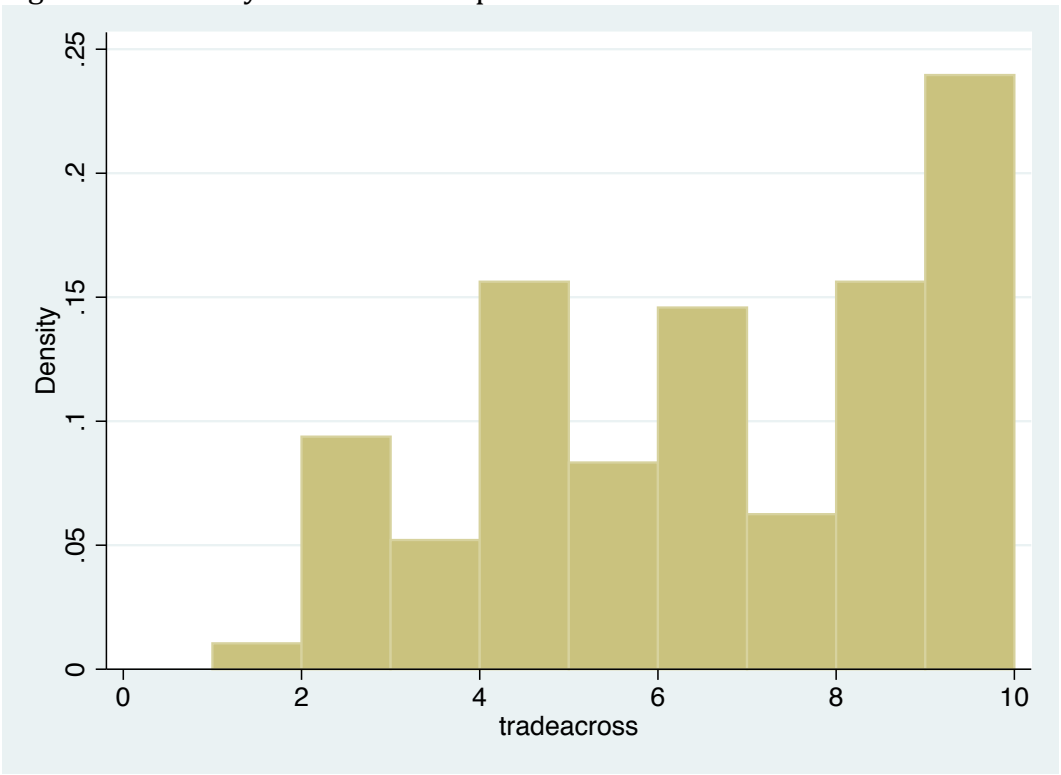


We now describe the scoring rule for trade across polities.

Scores for trade across polities:
1-2: Mostly autarky or foreign trade conducted only by government emissaries.
3-4: Foreign trade controlled by the government, using some private merchants.
5-6: Substantial private foreign trade but overall limited relative to the size of the economy. Significant trade barriers and contraband.
7-8: Large foreign trade with trade barriers but quite widespread smuggling
9-10: Intensive international trade conducted by private merchants playing a key role for the economy.

The intensity of trade across polities, represented in Figure 5, is more uniformly distributed with a spike at high scores. Countries with the lowest scores include Burkina Faso, China, Costa Rica and Ecuador. Among countries with the highest scores, we also have the usual but also Slovenia, Croatia, Unites Arab Emirates and Libya.

Figure 5: Intensity of trade across polities.



Let us now turn to political institutions. A major difference in political institutions is whether countries where territorial states or city-states. This is described by a dummy variable for either form of state. We will come back later to the link between territorial and city-states and the other variables. In our database, twenty percent were city-states and more than 60 percent were territorial states. A few countries have a mixed history of having been both.

The second variable for which we collected data is the index of power centralization. It is composed of two variables. The first one is an indicator of power concentration of the executive, and the second one is an indicator of government centralization.

This is how we scored this index.

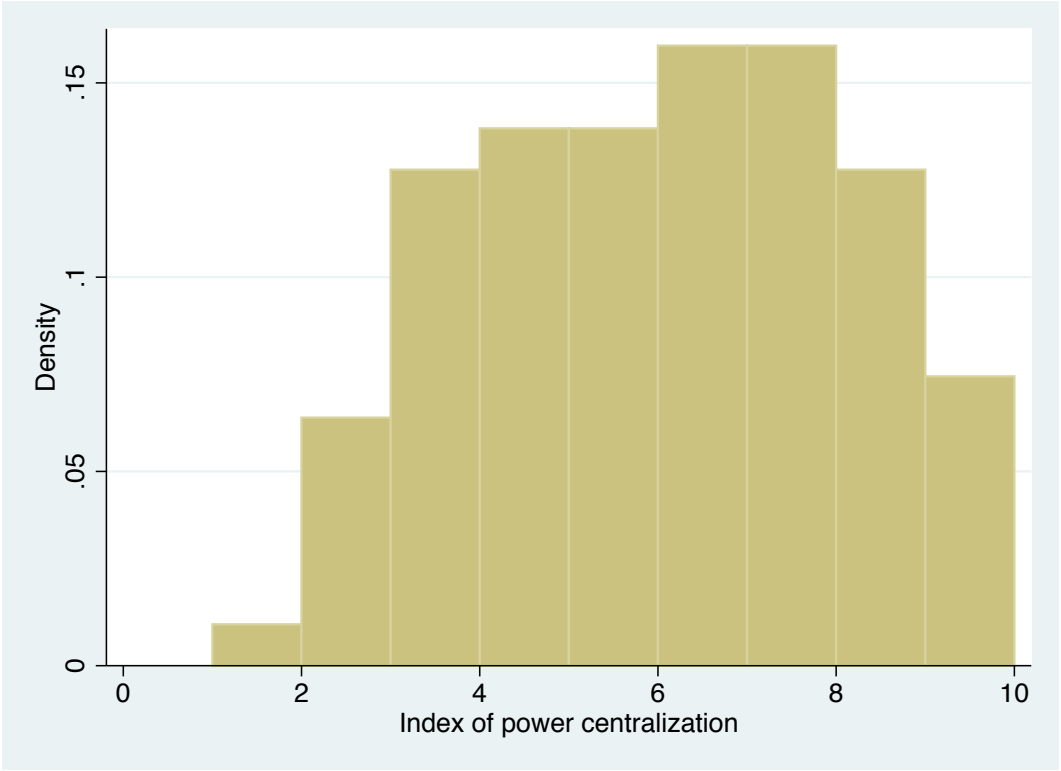
Concentration of power in executive in the central government (score from 1 to 5):
1: The ruler's executive power is greatly limited by the legislature and judiciary institutions. The ruler is subject to changes made by elections or assembly disapproval.
2: the ruler has large power in the executive realm but is limited in others.

3: The ruler has large power in legislative, executive and judiciary realms but his power is constrained by other organizations or institutions (term limits, assembly consent, legal constraints etc.)
4: The ruler has large power in legislative, executive and judiciary realms but his power is potentially constrained.
5: The ruler has unlimited power in legislature, executive and judiciary realms. The ruler generally rules for life.

Relationship between central and local government (score from 1 to 5):
1: decentralized. The local government is independent from the center. The central government has no power in appointing local officials or intervening local administration.
2: decentralized. The local government is de facto autonomous from the center. The central government has limited power in appointing local officials or intervening local administration.
3: centralized delegational system. The local government is administered by hereditary local rulers, and the central government cannot replace local officials at will. No separation of different aspects of local administration.
4: centralized bureaucracy. The local government is directly appointed by and responsible to the central government. The separation of powers and regular transfer of local officials are not institutionalized or not implemented.
5: centralized bureaucracy. The local government is administered by separate officials who are directly appointed by and responsible to the central government. Local officials cannot appoint lower-level officials at will, and they are transferred at regular intervals.

The distribution of power centralization is represented in Figure 6. The index is quite dispersed with a lot of variance, albeit more normally distributed. Note that at least 20 % of countries in our data had early on strong power centralization. This is the case for example of China, Ghana, Ethiopia and some Spanish colonies.

Figure 6: Degree of power centralization.



Another variable related to political institutions is the importance of cities in a country. The index we built is based on the sum of two variables, 1) a measure of urbanization rates (score out of 5 points) and 2) the importance of commercial cities versus administrative cities (score out of 5 points), the former being more important in statist systems and the latter in market systems.

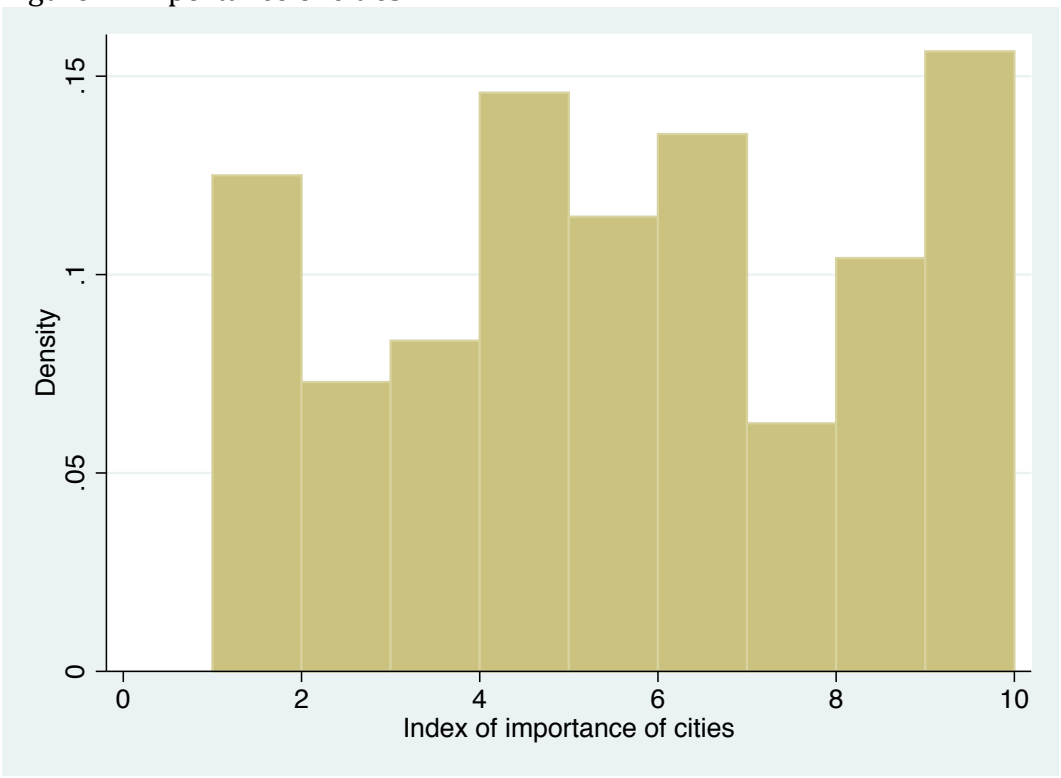
Score for the importance of cities:
Urbanization rate:
0: completely rural
1: the polity has only a few settlements/towns, cities in the real sense do not exist; low urban population. ==0%
2: the polity has a few towns or large settlements; relatively low urban population. <5%
3: the polity has a number of towns or cities, medium-level urban population. 5%-10%
4: the polity has a notable number of towns and cities; urban population is relatively high. 10%-15%
5: the polity is highly urbanized. Population is concentrated in urban centers and very high. >15%

Commercial Function of cities:
1: almost all cities are administrative/ceremonial/military centers; cities are not commercial centers

2: cities mostly are administrative/ceremonial/military centers; some commercial function
3: cities combined the function of administration and commerce
4: cities are primarily commercial and manufacturing centers
5: cities are commercial and manufacturing centers

Figure 7 shows the distribution of the importance of cities as measured by the sum of urbanization rates and the commercial function of cities (as opposed to the administrative function).

Figure 7: Importance of cities.



This variable is also relatively bimodal, as can be seen from Figure 7. Among countries with the highest scores, we of course have city-states, but also Slovakia, Uruguay, Belgium. Among countries with the lowest scores, we have ancient China and Egypt, as well as Germanic tribes and Scandinavia.

Let us now discuss social institutions and some sociological variables.

A first variable relates to the role of merchants in society.

Score for role of merchants:
1: Almost all exchange is based on reciprocity or redistribution. No markets and merchants in real sense exist in the economy.

2: Most exchange is mainly based on reciprocity or redistribution. Merchants are few in number and are generally rulers' agents. Markets barely exist.
3: Most merchants are rulers' agents and work for the ruler, or rulers themselves are merchants. Markets are limited.
4: Merchants are generally rulers' agents but also participate in private trade. The state has strong monopoly and regulation in the economy. Markets are limited.
5: Private merchants participate in a strictly regulated market subject to state interference. Some merchants may be state agents. Merchants are subject to close supervision, regulation and predation from the state. The state may have monopolies in many industries. Markets exist.
6: Private merchants participate in a strictly regulated market subject to state interference. Merchants are subject to supervision, regulation or predation from the state. The state monopolizes certain industries. Markets exist.
7: Private merchants participate in a regulated market. Merchants are subject to certain regulation, monopoly or predation from the state. Markets exist.
8: Private merchants participate in a partly free market. Merchants are subject to certain regulation, monopoly or predation from the state. Large markets exist.
9: Private merchants participate in a mostly free market. Large and numerous markets exist.
10: Private merchants participate in a free, developed market; large and numerous markets exist.

Figure 8: The role of merchants in society

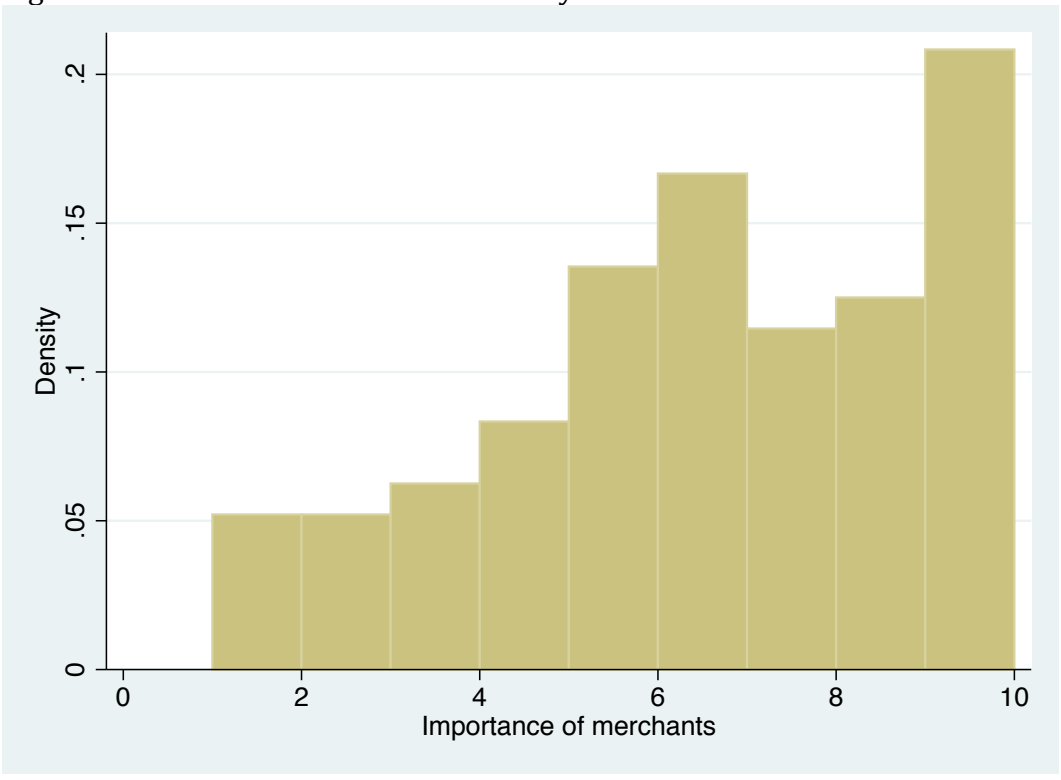


Figure 8 on the role of merchants is also bimodal but with the two modes being for scores above 6 and at 10. Among countries with a low score are China, Malawi, Sierra Leone and Fiji. Among countries with a high score Anglo-saxon countries but also Indonesia, Finland and Estonia.

Kinship rules are nearly equally divided between societies that had unilineal kinship rules and those that had bilineal kinship rules. We discuss kinship rules below. Kinship rules, however, directly affect strength of clan. Indeed, unilineal kinship rules clearly define a common ancestor, which is not the case for bilineal systems. Therefore, bilineal kinship systems should have weaker clan systems. We define below our scoring rule for the strength of clan.

Score for strength of clan.
Score based on sum of scores of following 5 variables.

A Family size (nuclear family, extended family) (2 point)
0: nuclear family is the primary family type
1: mixed (stem families)
2: extended large family/compound is the primary family type

B Importance of clan organization in society (2 point)
0: no clan
1: clan only exists in particular social groups (e.g. only important in nobility)
2: clan is prevalent in all parts of social groups/peoples

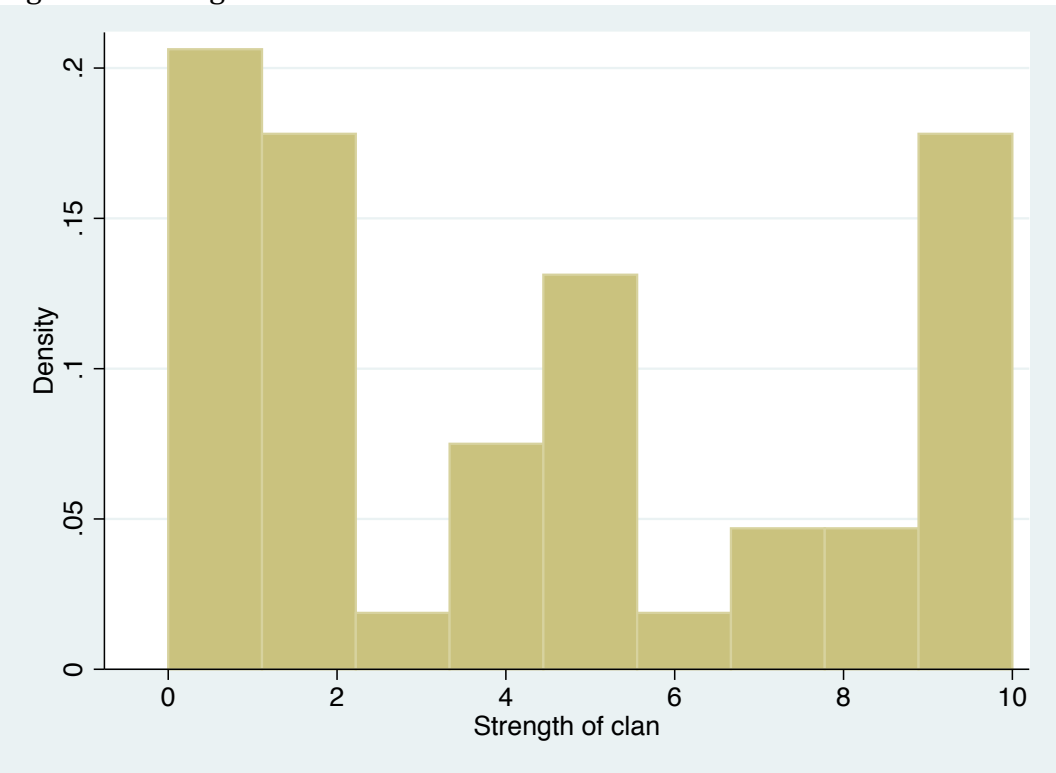
C size of the clan (2 points)
0: no clan
1: medium size: small "clan" or lineage
2: clan typically is large, consisting hundreds to thousands of people

D importance of the clan in people's life; "strength" of clan (2 point)
0: no clan
1: the clan is "dispersed", non localized. The clan is not the residential unit, members have fewer ties with each other (e.g. remote or invented ancestry, clan only important in some aspects of life.)
2: the clan is "localized". Typically the clan is the residential unit, members have strong ties with each other (e.g. exploit common resources and inhabit common territory; people usually live close to each other; same ancestry, clan typically forms a political, economic and social unit)

E conflict solution (2 points)
0: the clan has no function to solve dispute between individuals/the clan does not exist
1: mixed

2: clan elders/heads have supreme authority to solve disputes between individuals within the clan

Figure 9: Strength of clan.



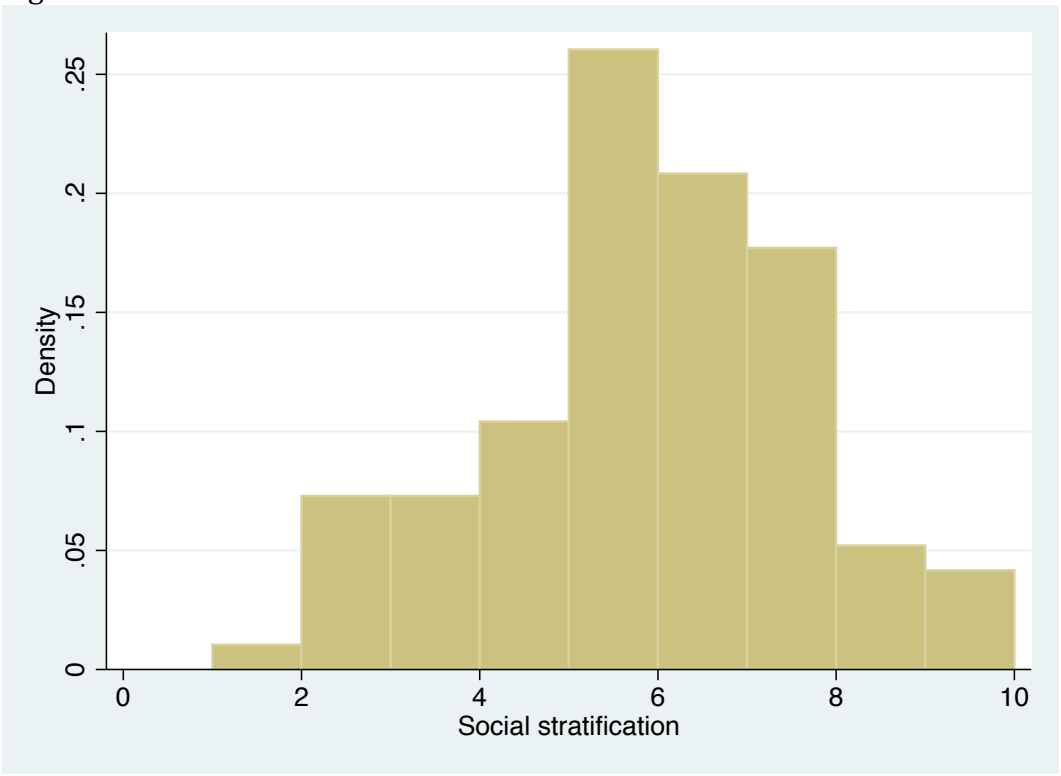
As can be seen in Figure 9, strength of clan is strongly bimodal with a large number of observations around 0 and 10. Among societies with the lowest scores, we have ancient Egypt, Scandinavian countries, several Latin American countries and Spain, but also many more countries. Among societies with the strongest scores, we have many African countries, but also China, Albania and the United Arab Emirates.

Another sociological variable is related to social stratification. Here is how we scored that variable.

Score for social stratification.
1: society is not stratified (egalitarian). Status is not hereditary. Typically seen in pre-states or in tribes, clans based on kinship
2: Few distinguishable social strata existed in society. Status is not hereditary for the most cases and widespread mobility between different social strata
3: Society has a few social strata. Status is not strictly hereditary and meritocracy could provide possibility of vertical mobility

4: Society has a few social strata. Some strata are hereditary while there is mobility in the others. Example: Hereditary freemen and slaves. Lacked hereditary aristocracy within freemen. Vertical mobility within the group of freemen is possible and prevalent
5: Society has many social strata. Some strata are hereditary while there is mobility in the others. Example: Hereditary freemen and slaves. Weak hereditary aristocracy within freemen. Vertical mobility within the group of freemen is possible
6,7: Society has many social strata. Most strata are hereditary; limited vertical mobility between strata. Example: hereditary freemen and slaves. Within the freemen group, there were the distinctions between hereditary aristocratic groups and commoners/peasants/serfs
8, 9: Society is highly stratified. Caste existed in most social classes/groups. An individual's status is almost strictly hereditary. Limited vertical mobility among different strata in the hierarchy
10 Society is highly stratified. Strong Caste in almost all classes/groups. An individual's status is strictly hereditary. Social status is ascribed; very limited vertical mobility among different strata in the hierarchy

Figure 10: Social stratification.

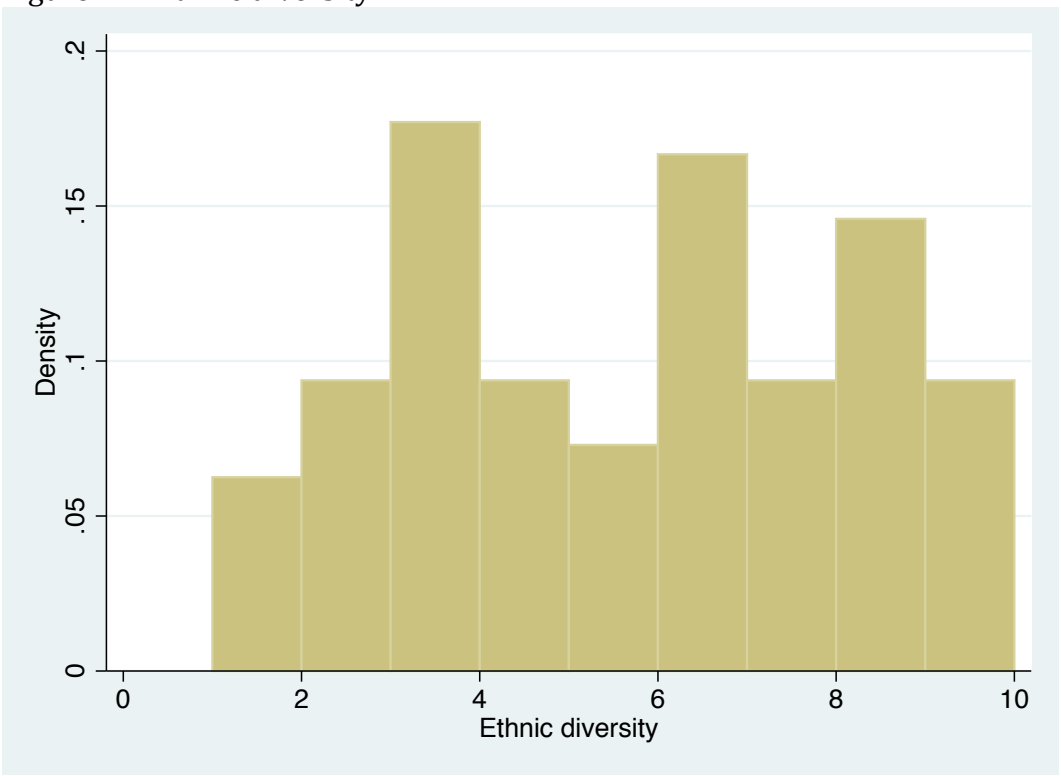


Social stratification, as can be seen from Figure 10, is strongly unimodal, with the highest scores being around 5 and 6. This means that most societies had some form of social stratification. Extremes are more rare here. At the highest end, we find the Indian caste system, but also Nigeria and Peru. At the lowest end, we have some African countries like Burkina Faso or Malawi but also China.

Our last sociological variable is ethnic diversity. It is very difficult to come up with precise measurement for this variable, but we can still rank countries fairly accurately. Below is the scoring rule.

Scoring rule for ethnic diversity.
1: perfectly homogeneous: single ethnic group sharing same culture, ancestry, religion, and language
2: two major ethnic groups roughly 10%-20% to 80%-90%
3: two major ethnic groups roughly 1/3-2/3
4: two major ethnic groups 50%-50%
5: three major ethnic groups 5%-20%-75%
6: three major ethnic groups 20%-30%-50%
7: three major ethnic groups 1/3, 1/3, 1/3
8: four major ethnic groups
9: four or more ethnic groups
10: perfectly heterogeneous: many (more than four) ethnic groups with different culture, ancestry, religion and languages

Figure 11: Ethnic diversity.



Ethnic diversity is more bimodal, as there is a strong mode with values around 3 below and between 7 and 9 on top.

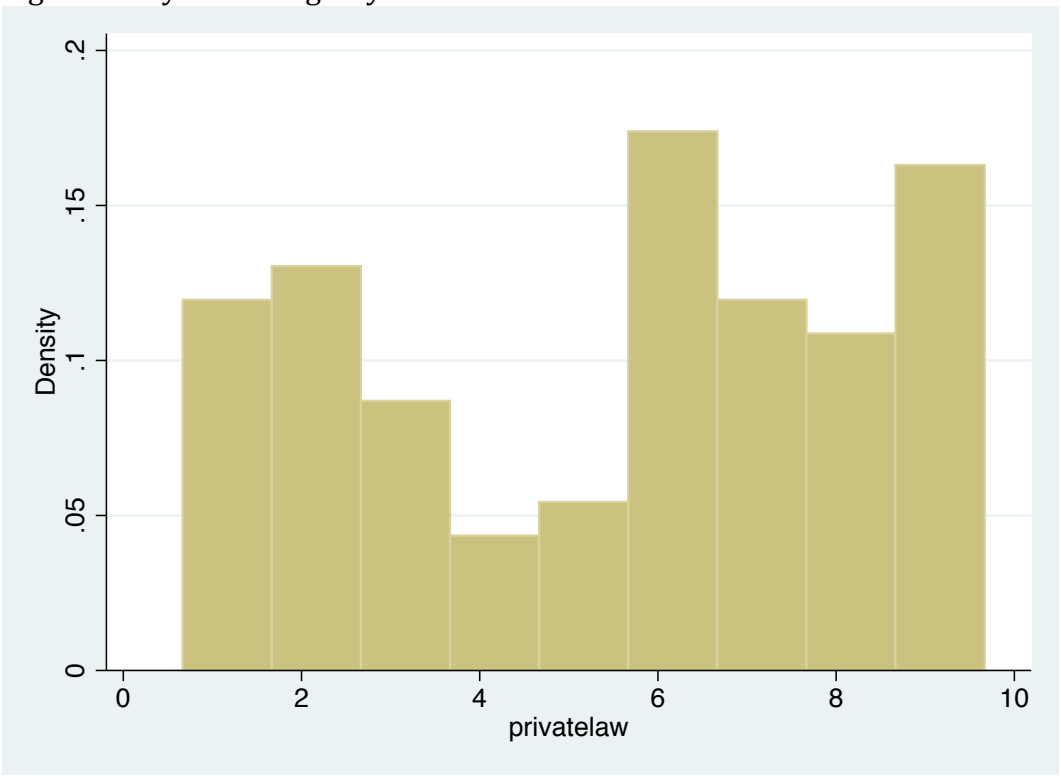
4. Institutional clusters?

When describing the institutional variables we gathered, we found that many of the variables were bimodal. Here, we look at the relations between the variables.

First, note that the legal variables (private ownership of land and slaves and the composite legal index) are strongly correlated. We already mentioned the correlation between private ownership of land and of slaves. The correlation between the composite legal index and the latter two variables is respectively 0.79 and 0.66.

Second, if we take the average of these variables and construct a synthetic legal system indicator shown in Figure 12, it is highly bimodal. We thus clearly see two institutional clusters at the legal level.

Figure 12: synthetic legal system indicator.

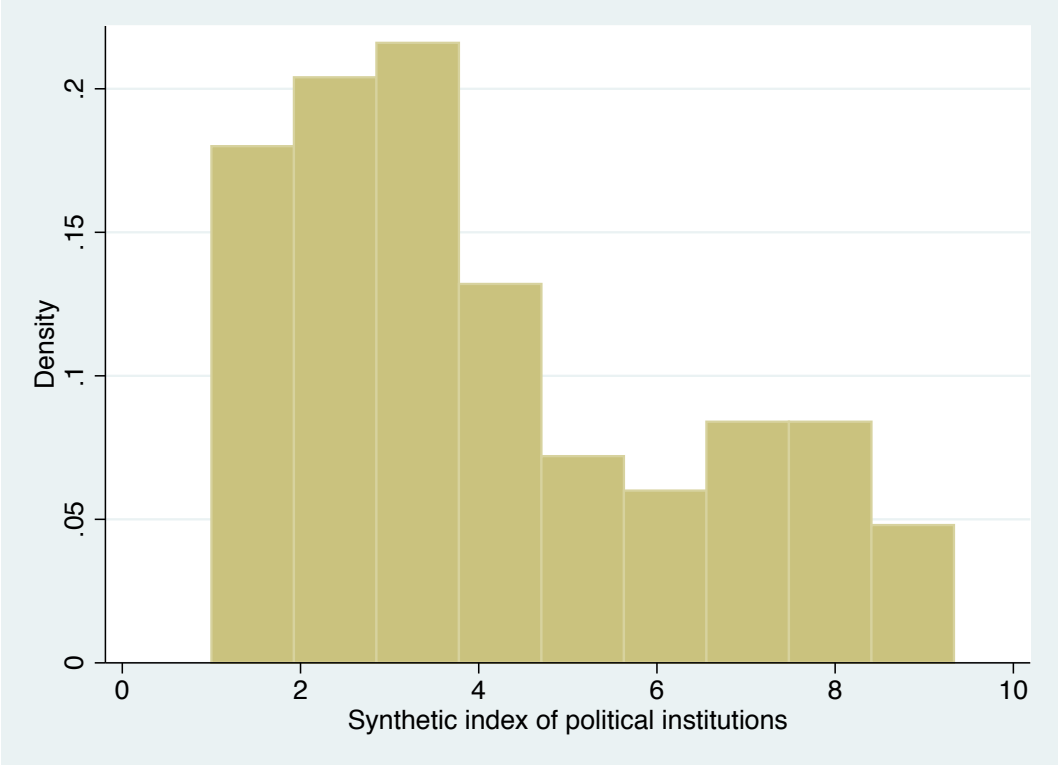


Just to give an idea, the lowest scores (below 2) are for China, Egypt, Fiji, Ghana, Namibia, Nepal, Sierra Leone and the highest scores (above 9) are for ancient Greece and Rome, Anglo-saxon and Scandinavian countries, Belgium and Spain.

We now construct an indicator for political institutions taking the average of three indicators: city-state, low power centralization and importance of cities. The

result is shown in Figure 13. As we can see, this indicator is also quite bimodal. Among countries with the lowest scores, we have China, Bhutan, Chile, Japan, Korea and Nepal. Among countries with a high score, we have Greece, Italy, Belgium, Netherlands, Malaysia, Nigeria and United Arab Emirates. Note that Anglo-saxon and Scandinavian countries do not have a high score on this synthetic political institutions index, because they had territorial states, albeit with checks on the executive, and not city-states. This is also the reason why the distribution is skewed to the right.

Figure13: synthetic political institutions index.

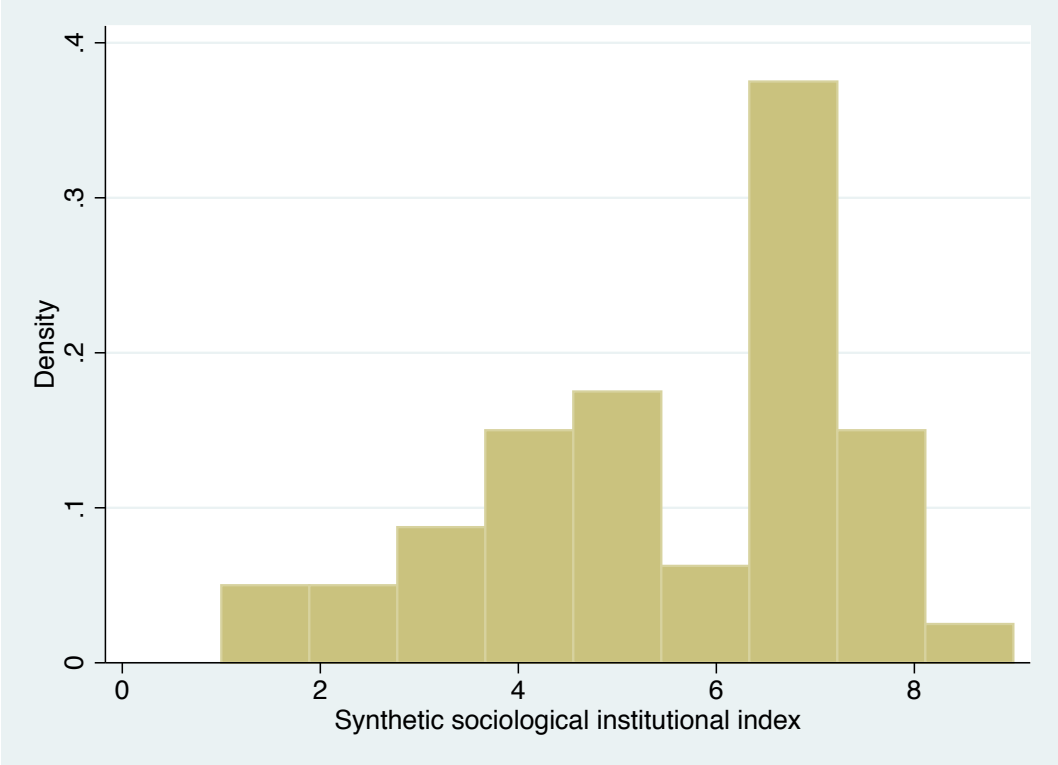


We now turn to our sociological indicators. We construct a synthetic index by averaging our sociological variables (importance of merchants, weakness of clan, bilineal kinship system, social stratification and ethnic diversity). As can be seen from Figure 14, it is not really bimodal. This is not surprising because the individual variables did not seem as bimodal as the legal and political variables. The indicator looks somewhat more bimodal, however, if we take out the social stratification index, with modes around scores of 3-4 and 7-8.

Overall, we can still conclude that in the antiquity, there were clusters of institutions. Some countries had legal systems enforcing and protecting private property, with political systems that were more decentralized centered more around cities, and involving sociologically a higher importance of merchants in society, weak clan systems and high ethnic diversity. Other countries instead had no

property rights, legal systems used as tools of oppression, territorial states with centralized government, strong clans, ethnic homogeneity and marginalization of merchants.

Figure14: synthetic sociological index.



5. Institutions and trade

We now regress measures of trade and market activity on these institutional variables. In Table 2, we look at the intensity of domestic market trade , i.e. trade within the polity and in Table 3, we look at the intensity of international trade, i.e. across polities.

Both tables give similar results. There is a significant correlation between both measures of intensity of market activity and our synthetic institutional indicators. Our synthetic legal, political and social as well as our aggregate institutional indicator are all significantly positively correlated with market activity. When we put all institutional indicators together, the social indicator loses significance, which is probably due to multi-collinearity, but the legal and political indicator remain strongly significant at the 1% level.

These results are consistent with a positive effect of pro-market institutions on the intensity of market activity. We do not claim a causal effect as institutions

may be caused by intensity of market activity, and there are plausible reasons this might be the case. Indeed, stronger market activity caused by some exogenous factors may have affected the demand for institutions. We do not try to disentangle that relationship as the causality probably runs both ways. What is important is to note this strong association between measures of institutions and intensity of market activity.

Table 2: Trade within polity and institutions.

	(1)	(2)	(3)	(4)	(5)
Private law	0.664***				0.482***
	(0.072)				(0.120)
Political institutions		0.659***			0.375***
		(0.092)			(0.109)
Social institutions			0.730***		0.190
			(0.111)		(0.134)
Institutional index				1.122***	
				(0.085)	
Observations	92	90	90	81	81
R-squared	0.444	0.318	0.247	0.539	0.550

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Trade across polities and institutions.

	(1)	(2)	(3)	(4)	(5)
Private law	0.706***				0.609***
	(0.062)				(0.096)
Political institutions		0.650***			0.366***
		(0.067)			(0.076)
Social institutions			0.591***		-0.027
			(0.125)		(0.126)
Institutional index				1.115***	
				(0.080)	
Observations	92	90	90	81	81
R-squared	0.540	0.330	0.172	0.566	0.623

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

What is important for us is to establish the validity of the comparative approach, establishing parallel trajectories between various countries. Some countries adopted legal, political and social institutions that were propitious for market development. Others instead adopted institutions that are more reminiscent

of central planning with limited private institutions, and also more limited market development. In Roland (2018), I show that these early institutions are strongly correlated with cultural differences in the modern world, with market systems associated with individualist culture and statist systems associated with collectivist culture.

6. Conclusion

We have documented in this paper institutional clusters in ancient times showing that while some groups of countries had market systems, others had statist systems that can be compared with centrally planned economies of the twentieth century. The data collection exercise we document in this paper is to our knowledge the first systematic attempt to show the coexistence of market and statist systems in ancient history.

This exercise is of course important from a historical point of view. Indeed, when researching ancient history, economists must avoid making generalizations based on a few countries alone. Statist systems were quite stable and lasted for very long periods. One of the most well-known statist systems, the Egyptian civilization, is to this date the longest lasting civilization in human history with roughly three millennia. Our evidence shows not only that there was strong institutional diversity in ancient history, but that countries gravitated either towards market systems or statist systems, the two big institutional clusters in ancient times.

It would be interesting to understand better why some countries developed more statist systems while others developed market systems. We have started collecting geographical data to determine the role they play in these early institutional choices.

Another question is whether the historical evidence documented in this paper matters to understand big issues of the modern world. In Roland (2018), we have done a first step in that direction by showing that countries with statist systems developed more collectivist values and beliefs while countries with market systems developed more individualist values and beliefs. This is important to the extent that collectivist and individualist cultures are the main cultural systems in today's world, and they have many important effects, be it in terms of patterns of innovation, comparative advantage, political institutions, etc. Jaspers (1951) had already noted that the world's most important philosophies and religions in today's world emerged in ancient times. Understanding the ancient world thus helps understand today's cultures.

The research presented here is only a first step in a more collective process taking place world wide to digitalize records from history and archeology to make them available for quantitative analysis. We hope this will encourage others to go further and deeper in this direction.

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