The historical roots of modern culture: evidence of 'moral sentiments'?¹

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Abstract

Samuel Huntington viewed world history as the clash of civilizations - of cultures differing in several dimensions, including religion. In contrast, Gerard Roland has proposed a one-dimensional approach, where the critical distinction between countries is whether they have the statist economy of a collective society; or the market-oriented system of an individualistic society. It is claimed, moreover, that current societies reflect the type of their respective 'founding civilizations'; and empirical evidence - based on historical data he has assembled – is offered in support of both claims.

Adam Smith saw a role for 'moral sentiments' in human behaviour, however; and anthropologists have emphasized the role of religion in promoting cooperation and contributing to the growth of civilisations. Could taking this into account enhance Roland's objectives of distinguishing between cultures and of tracking the effect of the past on present civilisations?

We show that the 'principal components' extracted from Roland's institutional data of founding civilisations help identify the historical conditions for the emergence of the key religious blocs of the modern world – offering, we suggest, a social/moral complement to the account of temporal authority that he has developed.

(186)

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JEL Codes: N00, P00, P50, Z1, Z12, Z13

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Let observation, with extensive view, Survey mankind from China to Peru. Samuel Johnson (1749)

Section 1. Introduction

1(a) Roland's Reductionism: Individualism vs. Collectivism

As if responding to the invitation from Dr Johnson, celebrated 18th century man of letters, Gerard Roland has proposed a concise framework for viewing different civilizations. This paradigm was spelt out in St Petersburg in 2017, where - on the centenary of the Russian Revolution – the focus was on the economic and social contrast between socialism and capitalism, which was seen as a latter-day manifestation of a long-running contrast in how societies are organised². The key distinction drawn by Professor Roland is that between Statism and Individualism - the former exemplified historically by Ancient Egypt and China, the latter by Mesopotamia and Classical Greece. To throw empirical light on this perspective, he referred to the data set that he has assembled to calibrate the salient characteristics of earlier civilisations.

As a second string of this historical bow, it was argued that the distinction has proved remarkably resilient: so the score on Individualism posted by many societies today should reflect the Statism or Individualism characteristic of their founding civilisations, often many centuries before.

How well this Spartan, one-dimensional characterisation of societal differences persists over time is the first issue we consider, albeit briefly, by presenting two stylised but important examples involving military and economic confrontations in our time. Combining historical data on the centralisation of power with current Hofstede scores on individualism illustrates the claim made by Roland – that contrasting modes of historic governance are reflected in patterns of personal freedom many centuries later, with historical statism counting against current individualism. This negative correlation is challenged when Islamic countries are added to the data set, however. Is there a case for treating the moral foundations of authority as another factor?

² This address to the World Congress of Comparative Economics has since been published as Roland (2020)

(1b) A Role for Religion as 'social glue' that builds cooperation?

In writing of *Economics and the Good Society*, Stiglitz (2024, pp.52 ff.) argues that 'managing externalities is at the foundation of civilization'. What then of economic models of market-clearing, as initially proposed by Adam Smith, and later transformed into elegant models of general equilibrium by Arrow and Debreu? In the *Wealth of Nations*, Adam Smith was, it seems, far from endorsing the 'selfish' neoclassical view of human nature embodied in such models. Drawing instead on ideas he had developed earlier in his *Treatise on Moral Sentiments*, Smith saw the need for 'other-regarding' behaviour to create a good society, where efforts would be made to mitigate negative externalities and to promote positive externalities - in providing for public education for instance.

Such a perspective was later to receive support from outside economics - from the theory of evolutionary selection, no less. For, in his treatise on *The Descent of Man*, written a hundred years later, Charles Darwin emphasized the importance of cooperative social mores for cultures to survive and spread.

In theory, as Ken Binmore points out³, cooperative behaviour can be ensured by appealing to the folk theorem of repeated games. The proof, however, involves the certainty of punishment for deviating from the socially efficient bargain in the repeated "game of life"⁴. Punishment is one device; but anthropologists such as Harvey Whitehouse (2024) identify religion, historically, as an alternative form of social glue that can promote cooperation where it is needed - in preventing the 'tragedy of commons', for example, and in helping to secure provision of public goods.

Anthropological research, by himself and others, into the role that religion has played in establishing cooperative behaviours 'that have allowed human societies to grow from small hunter-gatherer groups to vast empires and nation states', indicates that more complex societies and religious practice have evolved in tandem⁵.

³ The folk theorem promises that 'every contract on which rational players might agree in the presence of external enforcement is available as an equilibrium outcome in an infinitely repeated game.' Binmore (2005, p.81)

⁴ which, as Bowles and Gintis (2012) point out, will require support in the form of police, law courts and penal systems, institutions not mentioned in the folk theorem.

⁵ An alternative explanation for the growth of civilisations is that of Besley (2020): namely, that access to public goods makes people more willing to pay the taxes needed to provide them. The increasing returns to scale involved establishes a complementarity between the provision of public goods and civilizational growth.

As Professor Roland (2020, p. 489) observes, moreover:

the philosophies and religions of the axial age (ancient Greek philosophy, Hinduism, Buddhism, Zoroastrianism, Confucianism, Judaism, etc.) nearly all still play an important role in the modern world. They are the main inspiration behind modern cultures and cultural differences observed in today's world...

Despite their importance in historical and cultural development, there is no reference to religious institutions or social norms in the wide-ranging data set that Roland has assembled, however. By revealing a second dimension in this data, however, we believe that the objectives of distinguishing between cultures and of tracking the effect of the past on present civilisations can be considerably enhanced. In particular, we find that adding the second dimension effectively separates the ancient institutional origins of contemporary religious clusters in a way not possible using only Individualism vs. Statism.

(1c) Structure of the paper

As a preliminary, in Section 2 Roland's methodology is briefly illustrated with two stylised examples of contemporary relevance⁶ - the creation of NATO as a military alliance after WWII; and the contrast between G7 and the BRICS (Brazil, Russia, India, China, and South Africa) as two competing economic groups. We then note the challenge posed when Islamic countries are added to the second data set.

In Section 3, we discuss the use of Principal Components Analysis (PCA) as a means of reducing the dimensionality of the data; and the identification of key subgroups in a two-dimensional 'culture map', with the World Values Survey (WVS) cited as a relevant precedent.

Application of these techniques to Roland's historical dataset is presented in Section 4, where religious blocs are identified in a global culture map for the founding civilizations based on the first two principal components (PCs). The first accounts for 53% of the variance in the historical data set: the second factor, accounting for a further 15%, plays a key role in helping to define country blocs corresponding to differences in religious affiliation.

⁶ For convenience, we take the original/earlier membership of these groups before the recent substantial expansion.

The placement of these groups on the culture map, and the factor loadings involved, are examined to offer some interpretation of these principal components. The first corresponds broadly to the contrast between individualistic commercialism and centralised statism that Roland has emphasized. While much less clearly defined, the second may - like the second factor in the WVS surveys - relate to the nature of moral authority wielded in different civilizations.

Given the presence of a significant second factor, Section 5 concludes that the distinction between civilizations is better described empirically by taking it explicitly into account. Like the contemporary cultural data sets assembled by WVS, Fog (2023) and Minkov (2018), Roland's historical data better describes modern cultural (in our case religious) groupings when considered in two dimensions.

Annexes 1 to 3 provide technical detail for material in the main text; and in Annex 4 our global culture map is used to illustrate Huntington's cryptic comments on the varying roles of God and Caesar in different civilizations.

Section 2. Roland's methodology: two stylised illustrations - and a challenge.

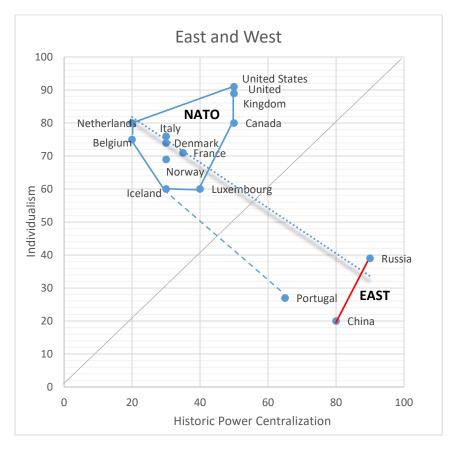
Roland's empirical methodology involves two steps. First, to test Hypothesis One - the proposed cultural division - by examining features of the 'founding civilizations' to see whether their institutions were more likely to foster individualism or to consolidate collectivism. Then, as a test of Hypothesis Two - historical persistence - to try 'explaining' the *current* measure of each country's individualism - specifically its Hofstede Individualism (IDV) score - with reference to one or more institutional features of its founding civilization, using least squares regression.

Here, to illustrate this methodology in practice, we offer two stylised examples of contemporary significance. These cases take a highly restricted subsample of countries; and make use of only one institutional feature of their founding civilizations, namely the measure of "power centralization" that is provided in his extensive historical dataset⁷.

2 (a) East v West (NATO)

⁷ Note, however, that the specific variable we use to capture the link with the past is not one that Roland (2020, Table 11) includes in his own exploration of such links. To illustrate the geopolitical perspective of Milton Friedman, an even simpler example is provided in Miller (2023b).

Restricting the sample to China, Russia and the twelve founding members of the North Atlantic Treaty Organisation, provides a sample with a military focus: East v West. Do the various founding civilizations of this subsample demonstrate the cultural divide (between Statism and Individualism) proposed in Hypothesis One? Do their individualism scores reflect their deep historical roots as in Hypothesis Two? To address these questions, we plot the current measure of Individualism using the Hofstede index (IDV) for each of the 14 countries together with the historic power centralisation (HPC) index provided for its founding civilization in Roland's dataset, see Figure 1.



Source: Roland (2020)

Figure 1 Historic Power Centralisation and current Individualism: East v West

A striking feature of this sample is the sharp contrast between the historically autocratic East (as represented by China and Russia, with HPC measures of 80 or higher), and the much more individualistic West (where all the original members of NATO, except for Portugal identified as an outlier⁸, have HPC

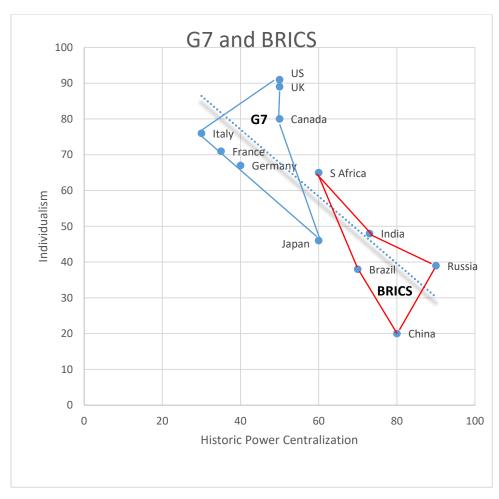
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⁸ Note that the Portuguese *Estado Novo* regime was one of the longest-surviving authoritarian states in 20th century Europe, lasting from 1933 to 1974, with Antonio de Salazar in charge from its inception until 1968!

scores of 50 or below). The downward-sloping line of best fit shows current measures of Individualism (IDV) to be negatively associated with Historic Power Centralisation; and so provides some evidence in support of the second hypothesis – the successful transmission of deep historical roots.

2 (b) North v South: G7 and BRICS

Next, for an illustration with an economic focus, we plot a subsample where the countries selected include those in the G7 group of rich nations (six Western nations plus Japan) and the BRICS, signifying the four original BRIC countries (Brazil, Russia, India and China)⁹ together with South Africa, added not long afterwards. See Figure 2.



Source: Roland (2020).

Figure 2. Historic Power Centralisation and current Individualism: BRICS & G7 Once again, there is a marked division in the sample with all the original BRIC countries getting high scores (70 and above) for the historic centralisation of

⁹ selected by Jim O'Neil as a useful summary of the principal non-Western economies as of 2001.

power, with South Africa scoring 60; by contrast all G7 countries get HPC scores of 50 or below – except for Japan with 60. As is evident from the figure, the G7 countries, which broadly represent the West, are markedly individualistic, except for Japan; but this is not the case for the original BRIC countries, whose IDV scores are all below 50.

The contrast between these two groups does not involve seriously binding commitments, like that of Article 5 signed by NATO members¹⁰; but it does reflect differences of historical experience, with respect to colonialism in particular. And it shows that, even when the sample is extended beyond that in Figure 1 so the non-Western group embraces three more civilizations (Japanese, Indian and South American¹¹), the overall picture continues to provide to provide broad support for the cultural distinction noted by Roland: that countries can be categorised as collectivist or individualistic based on their historical roots¹².

In the next section, however, this parsimonious, 'one-dimensional' approach is confronted by a challenge from what Huntington calls the Civilizational Paradigm.

2 (c) The Civilizational Paradigm at a global level – adding Islam

The sample of G7 nations together with the four BRIC countries appearing in Figure 3 above involves six of the seven civilizations Huntington considers important. What if we simply add the seventh civilization, Islam, to the sample and see how it compares with the others?

This is not straightforward as there are more than a dozen Islamic countries in Roland's data set. For diagrammatic clarity, Figure 3 shows only those on the perimeter of the Islamic bloc. This 'convex hull'¹³ appears as a horizontal bloc in the figure, with Historic Power Centralization varying between 100 for Pakistan and 10 for Mozambique, for example. Nevertheless, all scores for current Individualism lie below 50.

¹⁰ Committing all members to act in response to an attack on any one member.

¹¹ If, for convenience, Brazil is treated as representative of Latin American civilization more broadly.

¹² Note also that, even though Portugal and South Africa appear as 'outliers' in their respective groups, their individualism scores are nevertheless in line with their particular historical roots.

¹³ "indicating the area of a two-dimensional plot covered by various subsets of observations." Joliffe (1986, p. 67).

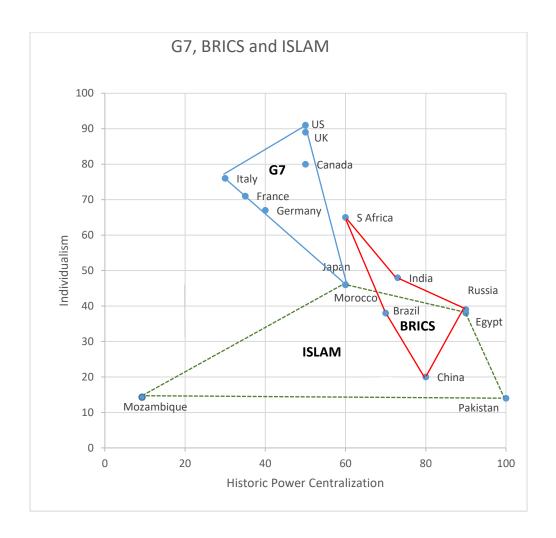


Figure 3. BRIC nations, G7 and Islamic civilization: a comparison

Evidently, the bloc for Islamic countries in this Figure lacks the negative slope observed in the sample of Figure 2; so, no matter what the historic centralisation of power may have been for these countries, they currently show a notable lack Individualism. Adding Islam as a separate civilization appears to introduce a new dimension into the distinction between the West and the Rest offered in Figure 2. How to take this into account?

Section 3. Two-dimensional maps of modern culture: selecting the most salient factors

One way of checking how many dimensions may be relevant for cross-country cultural comparisons is to extract the 'principal components' (PCs) that capture

most of the variance in large data sets containing observations on several cultural variables¹⁴; then to use them in constructing a global culture map.

Based on responses to questionnaires circulated around many countries since 1981, the World Values Survey (WVS) team repeatedly use this methodology to study the varied culture of modern societies. Though information on dozens of cultural features of the contemporary world, including religion, is collected, they are content to focus on the first two principal components (which accounted for about half of the cross-national variance in a factor analysis of 43 characteristics in the survey of 1990-93, for example).

This enables WVS to plot a global 'culture map'15 (updated after each wave of their questionnaire) where a country's position is based on the mean score of its respondents on each of these two factors. The map in Inglehart (1997, p. 93), based on 1990-93 survey data, is reproduced as Figure 4. Though not essential, it is conventional to offer some interpretation for these PCs, each a weighted sum of the observed characteristics, with weights chosen for their explanatory power. The labels chosen by WVS are, as shown, Survival vs. Selfexpression for the first PC measured on the horizontal axis, accounting for 50% of the variance; and Traditional Authority vs. Secular-Rational Authority for the second PC measured on the vertical axis (so-called Modernization), accounting for an additional 21%.

As indicated in Inglehart (1997, Figure 3.2 on p.82 and pp. 84, 85), the items that have high loadings for Traditional Authority (and so load negatively on the vertical dimension of Figure 4) include the importance of religion and religious faith, as well as obedience, respect for authority, work, and family.

As can be seen from this WVS culture map, plotting 43 countries using these two principal components yields eight geographically defined clusters - namely Western Europe (separated between Protestant and Catholic), Englishspeaking, Confucian, Eastern Europe, South Asia, Latin America, and Africa. In constructing this map, the WVS team drew on data collected covering aspects of religious belief; and it is worth noting that – on classifying English-speaking countries as Christian and Latin America as Catholic as in Figure 3.6 of the WVS

¹⁴ The first principal component is the linear combination of variables that captures the largest proportion of the variance of the original data, X. The second principal component then captures the largest proportion of the variation in the residual after removing the first; and so on.

¹⁵ Let the data set, X, have n observations on k variables. The variance matrix of X is subject to an eigendecomposition, and a subset, r<k, of the eigenvectors associated with the r largest eigenvalues is used as a new orthogonal basis for re-expressing the original observations in terms of synthetic new dimensions which capture the common variation in X more efficiently than the original k variables.

study – most of these geographically-defined clusters identify countries shown as sharing a common religious affiliation.¹⁶

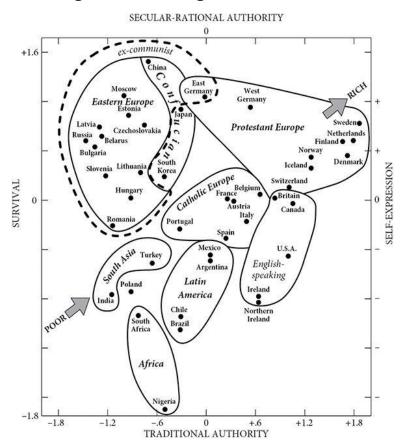


Figure 4. The WVS culture map of the world [Source. Inglehart (1997, p.93)]
As the pioneering WVS investigator Ronald Inglehart claimed:

The reality is that cross-cultural variation is surprisingly orderly and can be interpreted with a relatively parsimonious model. Fully half of the cross-cultural variation among this broad list of variables can be captured in just two dimensions. Inglehart (1997, p.91 and p. 101)

Subsequent cross-country factor analysis in academic journals appears broadly to support this bold conclusion. Thus, in a recent paper entitled "Two-dimensional Models of Cultural Differences", the author claims that his survey - which covers 92 cultural variables from 33 published cross-cultural studies, including those of Hofstede and Inglehart - 'confirms previous findings that two factors can account for a large part of the variation in all major published cultural variables.' Fog (2023, Abstract).

¹⁶ The arrows on Fig 4 express the interpretation in Inglehart (1997) that societies progress from an emphasis on survival and tradition in conditions of poverty to an emphasis on individual wellbeing in conditions of modern economic growth in a more secular setting.

Section 4. Principal Components Analysis of Professor Roland's historical data

Empirical cross-country comparisons of culture offer persuasive precedents for looking at more than one factor. Roland's historical data contains no variables bearing directly on 'moral sentiments'; yet the bimodality observed in many of the plots showing the distribution of characteristics that are measured¹⁷ suggests there is considerable cultural heterogeneity. Does this call for a second factor to be taken into consideration?

A fascinating biological case where a second factor plays a key role is discussed by Joliffe and Cadima (2016). They refer to the species Kuehneotherium, one of the earliest mammals, whose bones and teeth - washed into fissures in the rock about 200 million years ago - were found during quarrying of limestone in South Wales, UK. Given a sample of 88 fragments, palaeontologists reckon they can separate a relatively compact cluster belonging to a species of the shrew-like Kuehneotherium, from a broader group coming from some related, but as yet unidentified, animal species. To achieve this separation, it was not sufficient to note that their teeth were relatively large (PC1); the shape (PC2), adapted for 'shearing' soft prey it seems¹⁸, had to be taken into account as well.

What to make of the second factor of Roland's institutional data in our case? By examining its capacity to help separate the historical origins of key religious clusters, we may discover institutional features that helped shaped the various founding civilisations¹⁹. This - like the second factor identified by WVS - could provide some evidence of social/moral authority, to complement the account of temporal authority that he has developed.

Though the data set Roland has assembled contains no observations on religion or religiosity *per se*, it does contain a great deal of information about ancient cultural diversity.²⁰ As well as direct measures of economic activity - such as role of merchants, the importance of trade and private property, the ease of transport and of raising taxes – it includes a wide variety of other measures on the nature of ancient societies. These include how centralised

¹⁷ shown graphically in Roland (2018)

¹⁸ Kuehneotherium is reckoned to be an insectivore that could consume only soft-bodied insects such as moths, as its teeth are not suited for crushing harder prey.

¹⁹ On the importance of institutions for maintaining cooperation, see, for example, Maynard Smith (1982, Chap.13) and Bowles and Gintis (2011, Chap. 5).

²⁰ Observations used here are currently restricted to those societies for which Roland provides a complete set of observations: a subset of 73 societies with a wide distribution across continents and faiths.

was power, the role of law, the clan structure, ethnic diversity and tolerance of foreigners, and the importance of cities, for example.²¹

Given this historical data, a two-dimensional plot is obtained by extracting the first two principal components, which together account for almost 70 percent of the total variation. We examine this 'global map' to see how the second factor helps to separate the various blocs of religious affiliation, identified by the convex hulls of their representative countries.

4 (a) Plotting a global culture map for the 'founding civilisations'

By analogy with the culture map of WVS, Figure 5 shows the results of plotting the data country by country, with the abbreviated country labels spelled out in full in Annex 1. Thus, for each country, the horizontal axis measures the weight attached to the first component (which accounts for 53% of the sample variance); likewise, the weights on the second component (which accounts for another 15%) are plotted on the vertical axis²².

Four blocs showing the dominant religious groupings are then identified: these are Christianity, Islam, Hinduism and a group we have labelled Confucian/Buddhist. In the absence of historical data, each society in Figure 5 has been classified by its dominant modern religious affiliation as recorded in the Pew world survey or the CIA World Factbook; and the convex hulls plotted for these four groups are discussed in turn below. By examining this combination of ancient data on founding civilisations together with modern data on religious affiliation, we are effectively examining Roland's second hypothesis - the persistent effect of historical institutions on modern societies. Separation into coherent religious clusters²³ based on ancient data would support this hypothesis.

²² While we follow WVS and others in plotting results for two eigenvectors, a third dimension, explaining a further 12% of the variation, may be worth further investigation.

²¹ The full list of 23 characteristics can be seen in Annex 3.

²³ The term cluster is used here simply to denote a religious group defined by a convex hull and not one that has been obtained by the formal techniques of cluster analysis.

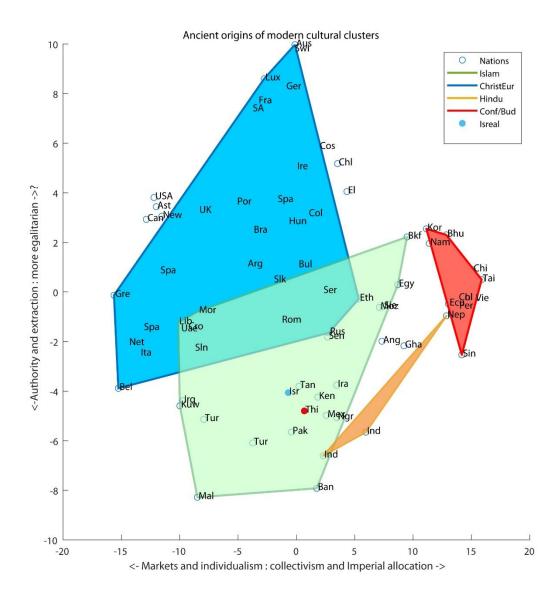


Figure 5: A map summarizing ancient institutional features, and the modern religious clusters associated with them. The horizontal axis gives country loadings on the first principal component; the vertical axis gives the loadings on the second. For some societies, Roland's data set contains multiple complete entries corresponding to alternative founding cultures; e.g. India appears twice, measured by both the ancient Mauryan empire and the medieval Bengal kingdom. But some large societies, e.g. Japan, Indonesia, are omitted at this stage due to missing data.

Before considering the placement of these blocs in the culture map, it may be helpful to recall Gerard Roland's observations in discussing the 'Institutional clusters in the ancient world and their effects on modern culture', Roland (2020, p. 489, with italics and underlining added).

Christian religion emphasizes salvation of the <u>individual</u> and the relation between the individual and God. These aspects of Christian religion were reinforced later with the different variants of Protestantism.

Confucianist philosophy is a good example of a <u>collectivist</u> philosophy.

Buddhist philosophy also has strong elements of <u>collectivism</u>. Buddhism does not encourage individuals to stand out, but are instead encouraged to lose their individuality, abstract from their desires and merge with the surrounding universe.

These Eastern philosophies stand in contrast with ... Judeo-Christian religion (and later *Islam*), that are more <u>individualist</u>.

In Figure 5 the convex hull for the *Christian religion* is the large, blue-coloured region lying to the "northwest" of the culture map - a region which appears to reflect the increasing importance of markets as one moves to the left on the map.(Confirmation is offered in the next section, where we note how heavily this factor loads on private property rights and markets.) For this Christian envelope, there are distinctively high weights on the second principal component. Though the interpretation of this axis (largely deferred to the next section) is less clear, it nevertheless plays an important role in achieving a separation of these religious blocs.

Note that the cluster for Christian religion has been restricted to European Christian societies (and Ethiopia), though many of its modern adherents are to be found in the former colonies of these countries, in the Americas and in Africa. Roland's observations on the American societies are mostly derived from his measurements of the colonial power, however, and so add little to the discussion of ancient origins, We see where they fall on the map but restrict the hull to the original European societies. Roland's data on African societies are potentially more interesting for the current discussion, however, being assembled, it appears, to represent the current state of knowledge about Africa's late pre-colonial kingdoms and societies. (While many Sub-Saharan African countries would now report Christianity as their dominant religion, they fall much to the south and west of the European group in Roland's data set: more akin to founder societies of the Islamic group.)

The *Islamic* group is represented by the large, green-coloured region straddling the centre of Figure 5. This spans a wide variation in ancient exposure to the first factor (of market organisation), with significantly lower readings on the second principal component. Malaysia (Mal), at the extreme "southwest" of the Islamic block, makes the role of the second dimension in the separation of Christian and Islamic clusters particularly clear. Although it has an ancient 'market' score similar to that of Saxon England (UK), it is differentiated by a strongly negative score in the second dimension (which summarizes features of ancient institutions captured by Professor Roland's data that are not well explained by the commercial markets vs. power centralisation axis).

Israel is high-lighted as the blue dot in the heart of the Islamic cluster. As Judeo-Christianity was arguably an important factor in the founding of Islamic faith, this is hardly surprising. It may capture something of the modern political tension within Israel itself, as documented in Sebag Montefiore (2012) for example: the tension between interpretations of the state and religion which derive from the European political traditions of the state's founding, and other interpretations directly connected to the ancient origins of Judaism.

Three cases of ancient *Hindu* cultures are included in saffron (two ancient Indian kingdoms and Nepal). As they lie to the east of the Islamic bloc, this suggests lower historical reliance on market structures in these polities at the time of their foundation.

Finally, a set of countries with significant exposure to Confucian ideas are presented in red, consisting of China, Korea, Singapore, and Vietnam. As the largest non-Western, modern religion in these nations is Buddhism, the group is augmented with the two other Buddhist countries in the data set, Bhutan, and Thailand. To preserve the focus of this group on Sinic civilisation, however, Thailand (Thi) – one of the most ancient adherents of Buddhism – is treated as an outlier and simply highlighted with a red dot in Figure 5. Bhutan's ancient institutions appear more similar to the Sinic group in which Buddhism remains popular today. ²⁴ The founding civilisations for these *Confucian/Buddhist* states apparently had very low levels of market orientation and the individual rights which go with it. However, their scores in the second dimension are modest, a point we take up later.

²⁴ Our interpretation here is influenced by Huntington (1996, p. 47): "Of Weber's five 'world religions', four - Christianity, Islam, Hinduism, and Confucianism – are associated with major civilizations. The fifth, Buddhism is not".

The separation of modern religious blocs in terms of their ancient institutional origins offered in Figure 5 clearly depends heavily on the second component: the overlap between the Islamic bloc and those for Christianity and Hindu religions would be far greater without regard to their contrasting placements on the vertical axis. The separation is admittedly far from complete, however. The considerable overlap between the Islamic bloc and the Christian bloc is significantly reduced when the latter is disaggregated, with Catholic, Protestant and Orthodox Christian clusters separately distinguished. This is apparent in the more detailed global map, Figure 6, which also separates Sunni from other Islamic faith groups.

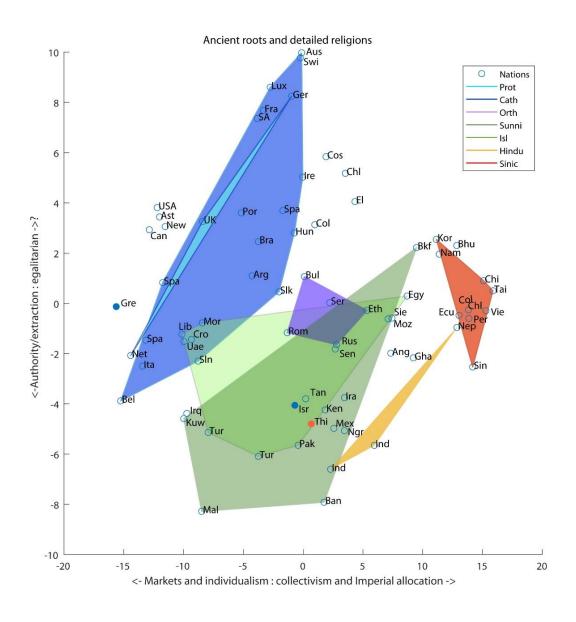


Figure 6 Plotting the founding civilisations on the culture map: with disaggregation

Huntington (1997, p.158) argued that his Civilizational Paradigm provided "a clear cut and compelling answer to the question: where does Europe end? Europe ends where Western Christianity ends, and Islam and Orthodoxy begin." What he referred to as "the great historical line that has existed for centuries separating Western Christian peoples from Muslim and Orthodox peoples" was not at all obvious in Figure 5, due to the large overlap between the Christian and Islamic groups shown there. When these two blocs are subdivided into sect-specific groups as in Figure 6, however, we find the religious clusters associated with Roland's historic data do largely confirm Huntington's dividing line, with Western Christianity (lying to the 'northwest') effectively split off from Orthodoxy and Islam (in the centre and 'south').²⁵

With respect to the Western Christian bloc, one observes that the Protestant cluster is contained within the Catholic cluster: but it lies close to the more individualist-egalitarian edge - as might be expected if one takes Roland's view that Protestantism reinforced the individual relation with God already present in Christian tradition.

In their survey of historical political economy, Becker and Pfaff (2023) observe that "Over many centuries, church and state have grown together, and apart. Sometimes the two are linked like Siamese twins; sometimes they are in conflict with each other." In this spirit, a simple graphical illustration of the balance between state and religious power in the various religious blocs is provided in Annex 4. With the summary comments from Huntington (1996, p. 254) inserted in a disaggregated culture map, we consider, albeit briefly, how this balance relates to placement in the map.

4 (b) On interpreting the principal factors themselves

How might one interpret the factors plotted on the axes of our global culture maps? Note that the ancient collective civilisations of Egypt and China appear to the right of Figure 5, while the more market-driven Western societies appear primarily to the left, ancient Greece for example. It is tempting to identify the horizontal axis as measuring *Commercialism vs. Collectivism;* and, as we shall see, the loadings that this factor accords to the underlying data provide statistical support for this interpretation. These loadings are displayed in Figure 7.

²⁵ Measures for Greece are those for Ancient Greece, while the other Orthodox societies are measured using their early medieval history. So, for present purposes, Greece is treated as an outlier.

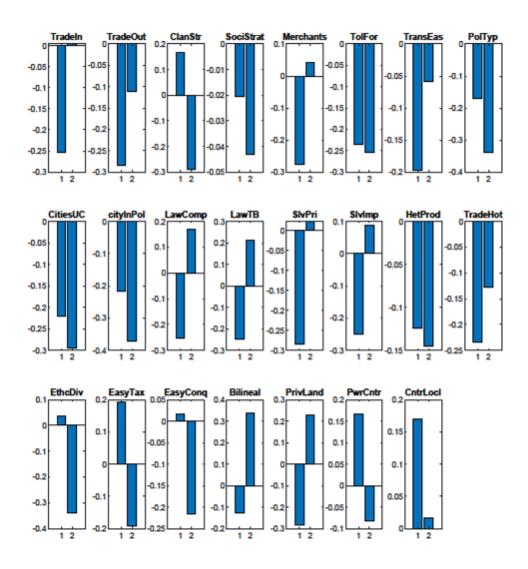


Figure 7: Loadings of the 2 primary PCs on 23 variables in Roland's historical dataset. Horizontal axis labels refer to principal components, the vertical axis gives the weight attached to each original variable in the relevant component. Variable names are given in full in Annex 3.

Ancient societies that we interpret as collectivist, or having low market-orientation (i.e. those located to the right in the global map, Figure 5) score as follows. They load negatively on trade within and between polities, were far from other trading zones (Figure 7, panels 1,2,16), had exceptionally low levels of personal property – both slaves and land (panels 13 and 21) – and a limited role for merchants within the polity (panel 5). They were fairly easy to tax and conquer (panels 18 and 19) and were not greatly urbanised (panels 8-10). These societies had less developed legal foundations, particularly the law governing relations between citizens as well as relations between ruler and ruled (panels 11-12). Power was highly concentrated in these societies (panel

23) with a strong preference for central over local government (panel 24). These characteristics seem broadly to match Roland's interpretation of collectivist or statist civilisations, Roland (2018, pp. 477,478).

More market-oriented societies, to the left of the culture map, conversely display high levels of private property rights, legal rights, urban economic development, etc²⁶. Regression results in Annex 2 demonstrate clear correlation between this market axis and modern development outcomes - similar to the regression results for some selected variables presented in Roland (2020).

What then of the vertical axis? Note first that Factor 2 does not load on power, trade, merchants or slavery, which supports the interpretation of factor 1 as corresponding to the economic organisation and power centralisation emphasized by Roland. So Factor 2 must describe a different type of variation, also captured by his data on historical institutions. Why should it be worth trying to interpret? One reason is that, as it helps clearly to separate modern religious groupings, it may help clarify this key feature of cultural differentiation. Another is that low scores on this factor are strongly associated with low individualism and high religiosity today - as well as with low economic development by 1970 and low catch-up growth since, see Annex 2.

To that end, we note that countries at the top left of Figure 5, mostly European, have low readings on PolType (0=pre-state, 3=large empire, 5=city state); are clearly bilineal rather than clan based; were quite hard to tax and to conquer; and had low ethnic diversity. So one interpretation is that these were relatively under-developed, small, unsophisticated societies — a reasonably accurate description of late antiquity Europe, especially northern Europe! As such, these (pre-)states would have lacked the extractive apparatus of large empires, e.g. of Central/East Asia and North Africa which appear lower down in Figure 5, with lower readings on factor 2. Crucially perhaps, they also lacked the complement of norms and authority structures required to justify or enforce taxation in the absence of an economic return.

As an aid to interpretation, we transfer the loadings shown in bar-chart form above into points on a map, see Figure 8, which gives a spatial representation of how the cultural characteristics (i.e. the variables of Roland's data set) are

²⁶ Regression results in Annex 3 demonstrate clear correlation between this market axis and modern development outcomes - similar to the regression results for some selected variables presented in Roland (2020).

combined, or weighted, to create the two principle components explaining the majority of variation across the data.²⁷

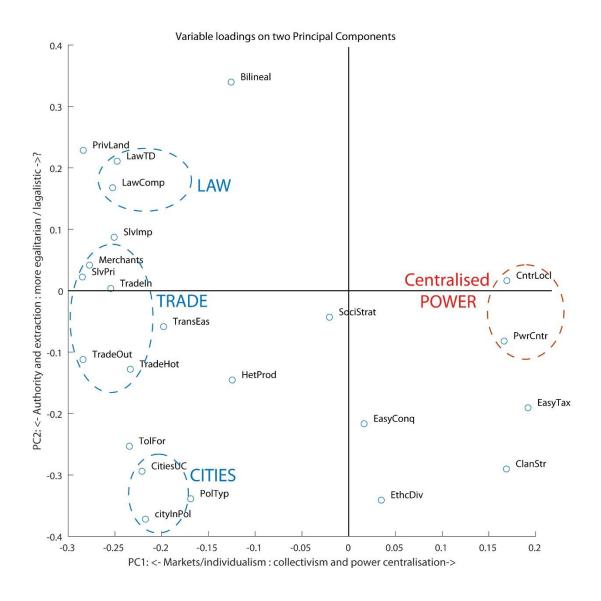


Figure 8 Showing the loadings of PC1 and PC2 on 23 variables in Roland's historical dataset; with 'bubbles' indicating important clusters

Note first how the first factor separates East and West, with the 'cluster' on the right highlighting the importance of centralised power in the East, in contrast with the 'cluster' on the left highlighting the importance of trade in the West. Evidently, the second factor yields a further separation between societies located to the left of these culture maps. Given the location of

²⁷ So, while the earlier global map, Figure 5, showed how different *societies* loaded on the first two principal components, this global map shows how *the characteristics themselves* load on the same components.

Western civilization to the North of these global maps and of Islam towards the South, it is worth considering whether this might indicate the presence of ancient institutional features that still influence the importance of religion in our time. For Islamic countries in particular, Braudel (1987/1993), Huntington (1996) and Acemoglu and Robinson (2019) all place special emphasis on the dominant role of religious belief in Islamic culture; and the regression analysis in Annex 2 confirms the relationship with religiosity consistent with the position of the Islamic bloc low on the vertical axis.

As indicated by the clusters in Figure 8, PC 2 loads heavily and positively on the law measures, and heavily but *negatively* on cities (U+C and CityInPol). Recall that the second principal component is constructed to account for residual variation in the data after accounting for PC 1, i.e. after any positive association between market activity and urbanisation has already been accounted for. The second factor therefore suggests that the Islamic bloc had a high degree of non-market-related urbanisation in its early or pre-history compared with the Christian bloc. Conversely the European bloc had high levels of legal development and *relatively* egalitarian legal systems (for the time).

Our second axis suggests therefore that the polities which became founder civilisations for today's Islamic countries had a high reliance on authoritarian institutions, capable of supporting ceremonial political and/or religious activity unrelated to market exchange. This might help explain why religion in the Islamic world became a central pillar of support for the authority of the despot, as Acemoglu and Robinson put it (see Annex 4).

While more data is needed to confirm (or refute) our interpretation of the second factor, there is no denying that better cultural discrimination is achieved when the political economy of societies that Roland has assembled data for is represented by two factors.

As noted above, WVS investigators have found empirical support for distinguishing between economic factors (on the horizontal axis of their global culture map) and the nature of belief and source of morality (on the other). We interpret the first eigenvector extracted from of Roland's historical data as capturing markets and individual rights *versus* statism and collectivism, in line with his original interest and hypothesis. The second eigenvector, we suggest, may be indicative of the source and nature of authority, including perhaps the capacity for resource extraction by those in authority.

5. Conclusion

Prompted by insights of historians, anthropologists and economists on the importance of cooperative behaviour in the history of our species, we have used Principal Components Analysis to examine Gerard Roland's historical data for features of the 'founding civilisations' that might be relevant. In addition to the first component, that distinguishes between societies in terms of Individualism vs. Statism along the lines he has proposed, we have found a second factor that helps significantly in accounting for the cultural variation among the 73 societies in the sample studied.

Taking our cue from the fascinating biological case of Kuehneotherium, we have analysed how this second factor helps to identify the historical origins of key religious clusters, and the institutional features that have helped shape the various founding civilisations.

If Stiglitz is justified in claiming that managing externalities is at the foundation of civilization — and anthropologists correct in proposing that religions have played a key role in promoting cooperative behaviour — then this factor may be helping to identify the historical roots of societal coordination in its various forms. It bears some resemblance, indeed, to the second dimension of the global culture map of the World Values Survey. Taking it into account is, we believe, a powerful way to extend Roland's work and learn more about the persistent effects of ancient institutional arrangements on modern outcomes.

This is but a first step, however. Further investigation along the lines pursued here could surely benefit from historical research on the societal role of religion. In their ingenious study of cultural evolution, for example, Schulz et al.(2019) propose that the Marriage and Family Program (MFP) of the medieval Western Christian church accounts for many of the distinctive characteristics of Western culture today. Accessing data collected by Seshat - Global History Databank could also help in exploring how and where moral sentiments have complemented political power.

A rather different direction of research, flagged up by the anthropologists and historians we cite (with empirical backing from WVS surveys such as Ingelhart (2020) *Religion's Sudden Decline*), is to study how the historical role played by religion is being supplanted by collective action inspired by other ideologies²⁸.

²⁸ With social democracy and the welfare state supplanting Christian charity in Europe, for example; and the Communist Party supplanting the traditional role of the Emperor in China!

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Annex 1 Key to labels used to refer to 23 of the variables in Roland's database

	Characteristic	Col	Full title in database	Scaling used
1	Tradein	G	Trade within the polity	1=state control; 10 =much
				trading
2	Tradeout	Н	Trade between polities	1=weak;10=strong
3	CanStr	N	Strength of clan	1=weak;10=strong
4	SociStrat	0	Strength of social strat'n	1=weak, 6=weak caste,
				10=strong caste
5	Merchants	Р	Role of merchants in trade	1=weak;10=strong
6	TolFor	Q	Tolerance of foreigners	1=weak;10=strong
7	TransEas	R	Transportation	1=difficult;10=easy
8	PolTyp	Υ	Type of polity	Pre-state (0); colonial
				territory (1); territorial
				state (2); (5) city state
9	CitiesUC	Z	Importance of cities	1=weak;10=important
			Urb+Comm	
10	cityinPol	AA	Importance of cities in	1=weak;10=important
			polity	
11	LawComp	AE	Law Composite	1 to 10
12	LawTD	AF	Legal relations	1=top down;10 =between
13	SlvPri	AG	Private slave ownership	Public=1 to private=10

14	SlvImp	AL	Importance of slave	1=weak;10=important
			population	
15	HetProd	AM	homogenous to	1 to 10
			heterogenous trade	
			conditions	
16	TradeHot	AO	Close to a trading hot zone	1 to 10
17	EthcDiv	AP	ethnic diversity	1=weak;10=strong
18	EasyTax	AQ	easiness of taxation	1=difficult;10=easy
19	EasyConq	AR	easiness of conquest	1=difficult;10=easy
20	Bilineal	AS	Bilineal dummy	1 or zero
21	PrivLand	AU	private land ownership	1=weak;10=strong
22	PwrCtr	BA	Power centralization	1 to 10
23	CtrLoc	BB	Relative power of central	1=decentralized;
			vs. local government	10 = centralized

Annex 2 Regression analysis: modern outcomes and ancient institutions?

Roland (2020) examines the correlation between modern outcomes, including measures of individualism and economic development, and selected variables from his data set. In this spirit, we examine the correlation between several contemporary indicators and the two historical factors (the principal components) identified above.

From the regression results reported in successive columns of Table A1, it appears that the ancient data, as summarised by the first two principal components, can 'explain' a good deal of the cross-sectional variation in GDP per capita since 1950 and in per capita GDP growth rates 1970-2019, as well as levels of individualism captured by the Hofstede index and the proportion of individuals in modern states reporting a degree of religious faith/practice in the Pew Survey (Religiosity).

As we would expect from Roland's results, lower loadings on the first factor, ²⁹ which we interpret as higher market exposure and lower power centralisation, correlate positively with economic development by 1950, and similarly 1970 for which more data is available. The effect is slightly attenuated by 2019 with rapid catch-up growth in East Asia over the past 40 years. This demonstrates the possibility of successfully adapting modern technology and developing economically successful governance in polities with very different ancient economic systems than Western Europe. This feature of the data may deserve more attention than the single-dimensional collectivism-individualism axis is able to offer. The market factor is associated with higher individualism scores and lower fractions of religious observers in modern societies.

²⁹ I.e. increases in -Z₁ are associated with greater market exposure, moving left in the Figure .

		Table 1:	: Regressio	n Results		
	GDP50	GDP70	GDP19	GDPgr	$\operatorname{HoffIDV}$	Religiosity
-Z1	0.0622	0.0779	0.0572	0.00315	1.66	-0.0034
	(0.0142)	(0.0118)	(0.0118)	(0.0115)	(0.221)	(0.00174)
Z2	0.0838	0.0844	0.0932	0.0389	2.33	-0.0188
	(0.023)	(0.0246)	(0.0249)	(0.02)	(0.456)	(0.0037)
$\log \text{GDP70}$				-0.299		
				(0.0945)		
$Z1^2$				0.00172		
				(0.00099)		
Const	7.98	8.61	9.82	3.62		0.869
	(0.115)	(0.105)	(0.103)	(0.802)		(0.0152)
ser	0.476	0.732	0.759	0.395	231	0.0168
R^2	0.485	0.464	0.35	0.219	0.564	0.295

GDP dependent variables are logs of real GDP per capita, calculated from expenditure estimates and population data in the Penn World Tables, version 10. Column 4 uses the 1970-2019 growth rate (log approximation) as the dependent variable. Hofstede's Individualism is included in Roland's data set alongside the ancient variables and here de-meaned for the regression. 'Religiosity' is one minus the fraction of respondents reporting 'No Religious Affiliation' in the Pew Research survey, see reference above. Standard Errors in parenthesis.

The second factor we extract from Roland's data set also correlates positively with economic development by 1950, and since, suggesting there is more to the relationship between development and ancient institutional inheritance than exposure to market mechanisms. In the levels regressions the size and significance of these positive associations are comparable to the positive associations between development and market roots. It is interesting, given our interpretation of this second factor in terms of more egalitarian power structures, and a less extractive state, to see that this counts heavily in favour of catch-up growth in the late 20th / early 21st century. Conditional on GDP per capita in 1970, this positive association is about 10 times larger than the positive association with ancient market exposure.

It has been widely suggested that limiting the arbitrary extraction of resources by the state³⁰ is important for economic development, e.g. Acemoglu and Robinson (2019) and Olson (1993), so this result supports the interpretation offered above that the second factor represents not only authority, but also extraction. As we would expect given the cultural groupings and economic associations, the second factor correlates negatively with religiosity and positively with individualism in modern societies³¹.

³⁰ which, to put it bluntly, could refer to the state as monopoly provider of violence in the territory.

³¹ For a conceptual framework to help analysing the many routes whereby religion can affect economic growth, see Becker et al. (2023).

Annex 3 Country key showing religious affiliation

	Country	Religion		Country	Religion		Country	Religion
Ang	Angola	Chr (col)	Gre	Greece	Chr	Pak	Pakistan	Isl (su)
Arg	Argentina	Chr (col)	Hun	Hungary	Chr (RC)	Por	Portugal	Chr (RC)
Ast	Australia	Chr (col)	Ind	India	Hnd	Per	Peru	Chr (col)
Aus	Austria	Chr (RC)	Ira	Iran	Isl	Rom	Romania	Chr (CO)
Ban	Bangladesh	Isl	Irq	Iraq	Isl	Rus	Russia	Chr (CO)
Bra	Brazil	Chr (col)	Ire	Ireland	Chr (RC)	SA	S Africa	Chr (col)
Bel	Belgium	Chr (RC)	Isr	Israel	Jewish	Sen	Senegal	Isl (Su)
Bhu	Bhutan	Bdh	Ita	Italy	Chr (RC)	Ser	Serbia	Chr (CO)
Bkf	Burkina	Isl	Ken	Kenya	Chr (col)	Sie	Sierra	Isl
	Faso						Leone	
Bul	Bulgaria	Chr (CO)	Kor	S Korea	Bdh	Sin	Singapore	Bdh
Can	Canada	Chr (col)	Kuw	Kuwait	Isl	Slk	Slovakia	Chr (RC)
Chi	China	Bdh	Lib	Libya	Isl (Su)	Sln	Slovenia	Chr (RC)
Chl	Chile	Chr (col)	Lux	Luxemburg	Chr (RC)	Spa	Spain	Chr (RC)
Cos	Costa Rica	Chr (col)	Mal	Malaysia	Isl	Swi	Switzerland	Chr (RC)
Col	Colombia	Chr (col)	Mex	Mexico	Chr (col)	Tai	Taiwan	Bdh
Cro	Croatia	Chr (RC)	Mor	Morocco	Isl (Su)	Thi	Thailand	Bdh
Ecu	Ecuador	Chr (col)	Moz	Mozambique	Isl	Tur	Turkey	Isl (Su)
Egy	Egypt	Isl (Su)	Nam	Namibia	Chr (col)	Uae	UAE	Isl (Su)
Eth	Ethiopia	Chr (CO)	Neth	Netherlands	Chr (P)	UK	UK	Chr (P)
El	El Salvador	Chr (col)	Nep	Nepal	Hnd	USA	USA	Chr (col)
Fra	France	Chr (RC)	New	New Zealand	Chr (col)	Vie	Vietnam	Bdh
Ger	Germany	Chr (P)	Ngr	Nigeria	Chr (col)			

Key: Bdh Buddhist; Chr (col) Christian colony; Chr (RC) Christian (Roman Catholic); Chr (CO) Christian (Orthodox); Chr (P) Christian (Protestant); Hnd Hindu; Isl (Su) Islamic (Sunni); Isl Islamic (other/non-sectarian).

Annex 4 Exploring the balance of power between church and state

To illustrate how the balance state and church power varies across the religious blocs, we insert the summary assessment of Huntington (1996, p.254) into a - slightly simplified - version of Figure 6, the disaggregated culture map, and discuss how these relate to the placement on the map.

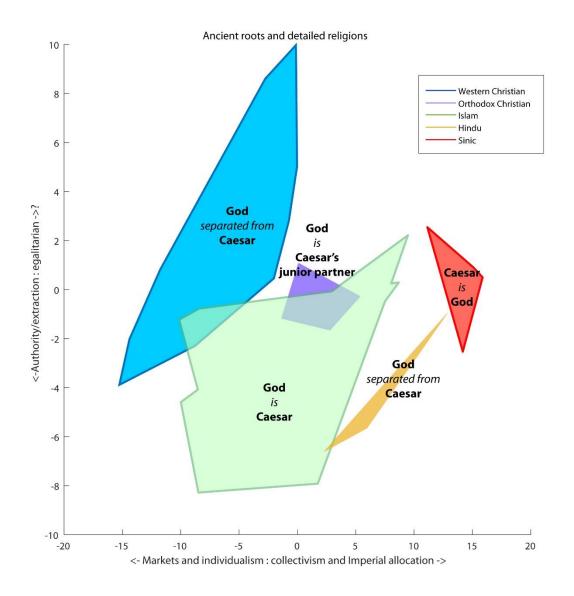


Figure 9. Huntington's comments on the five religious blocks, as identified by ancient institutional characteristics

Take first the two clusters where, according to Huntington, state and religious authority were kept separate, namely Western Christianity (in blue, upper left) and Hindu civilisations (in saffron, lower right). With respect to the former, Becker and Pfaff (2023, p.926) observe:

The particular notion that, no matter how intertwined in practice, political and religious institutions can be thought of as different and separate is an idea that owes much to the Christian doctrine of two powers (temporal and spiritual) that together constitute social order. The doctrine had an enormous influence on the development of secular law and delimited sovereignty in Western Europe.

To explain why the separation of political and religious authority did not lead to a similar result in the Hindu case, Acemoglu and Robinson (2019, p. 265) point to the pervasive presence of the caste system.

The roots of India's democracy go back to its history of popular participation in politics, resembling the assembly politics of Germanic tribes. But the parallel with Europe stops there. While, in Europe [subsequent historical development] expanded state capacity, institutionalized and strengthened society's mobilization, and in the process dissolved the cage of norms in Europe, no such thing happened in India. This is because of the nature and legacy of the caste system. Historically, at least, the state saw it as its duty to enforce and reaffirm the caste system, strengthening the cage of norms at every turn.

The placement of the Hindu cluster so far to the right of the Western Christian cluster offers some confirmation of the striking contrast in political culture between them.

Between these blocs where authority is divided lies another where religious and political power go hand in hand. We define this graphically by taking the union of Orthodox Christianity (in purple) and Islam (in green), both lying 'beyond the line where Western Europe ends'.

With respect to Islam, "the essential point is to realize how much religious beliefs and practices matter in the life of Muslims, imposing their own strict discipline. Everything, including the law, derives from the Koran." Braudel (1987/1993, p. 50). This close combination of church and state may encourage religious extremism, however. Why so?

The Middle Eastern cage of norms makes it very difficult to develop a discourse that criticizes the despot, because the despot claims to represent religion. Criticize him and you are criticizing Islam. This generates a natural tendency to couch and develop criticisms by pointing out that the despot is not sufficiently religious, and you are more devoted to the faith. Acemoglu and Robinson (2019, pp. 388, 389)

As one moves further to the right on the culture map, however, it appears that statism wins out over traditional religion. The placement of the Sinic bloc, where Confucianism plays an important role, provides confirmation. In the collectivist state of Shang-dynasty China – as in ancient Egypt - the divine Emperor or Empress was believed to help control the natural world of the empire in life³²; and to enjoy perpetual existence after death. These were the god-kings that came before the moralising ideologies and the Big Gods of the axial age, when "bad" religions gave way to "good" ones, to use the terminology of Harvey Whitehouse (2024, p. 63), with Confucianism conserving the collectivism of ancient China.

Acemoglu and Robinson (2019, pp. 205,206) describe what this involved as follows:

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³² As noted by Peter Frankopan (2023, p.139),"The elision of natural order and power would become a fundamental part of Chinese political and religious philosophy and of imperial political ideology over the course of three millenia. It effectively fused the role of emperor with good outcomes - environmental and otherwise. To justify the mandate, rulers had to rule well."

In the legalist model [of Sang Yang³³], order was the priority, and it was to be achieved by an all-powerful ruler crushing society with the weight of the state and its law. Even if the Confucian model disagreed with the heavy—handed approach of legalism and recommended moral precepts and earning "the people's trust", there was agreement between the two approaches on the basic tenet of despotism — the common people would have no say in politics and would certainly not become a counterweight against the state and the emperor. It was only the moral behavior of the ruler that would make him take into account his subjects' well-being.

In ancient China, the powerful imperial state clearly played a distinctive role in providing public goods — building the Great Wall, controlling rivers and building canals, for military and economic reasons and to enhance imperial prestige - with Confucianism promoting an appropriately collectivist mind set. Acemoglu and Robinson (2019, p. 207) take this a good deal further, arguing that: "Subsequent Chinese governments and laws, right up to the present, can be interpreted as a fusion between these two philosophies, each falling somewhere between Sang Yang and Confucius."

³³ the Legalist scholar who lived and worked in 4th century BCE, some time after the Shang Dynasty of the second millennium BCE.