University of Connecticut

Department of Economics Working Paper Series

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(forthcoming, <u>Journal of Comparative Economics</u>)

ABSTRACT: State and religion, two of the oldest institutions known to mankind, have historically had a close relationship with each other, but the disestablishment of state religions has been one of the most drastic institutional transformations that has taken place in the modern era. We offer a systematic analysis of the development of secular states based on a political economy approach that is centered on the notion of legitimacy. Viewing religion as a legitimizing force for political leaders, we consider the factors affecting the cost and benefits of alternative sources of legitimacy, such as the differential abilities of religious and secular sources to legitimize political rulers and historical inertia that shaped the cost of monitoring legitimizing agents. To examine this argument empirically, we built a cross-national time-series dataset for the relationship between state and religion since the year 1000. We first use the data to examine the evolution of secularism over time and its variation across religious traditions. We then use regression analysis and an instrumental variables approach to identify the influences on the adoption of secular state, such as concentration in the religion market, religious differences between rulers and the general population, historical inertia of a state, and the prevailing political regime. We address endogeneity concerns regarding the relationship between religious concentration and state secularism by exploiting variation among territories in their geographic distance to religious "capitals" of the world as an instrument.

JEL codes: H10, P5, N4, Z12
Key words: state, religion, secular, legitimacy, institutions, religious concentration, political economy, regime, historical inertia

October 2016

STATE AND RELIGION OVER TIME

1.   Introduction

The disestablishment of state religions has been one of the most drastic institutional transformations that has taken place in the modern era. Throughout history, states typically had an established religion, an arrangement that often went back hundreds or even thousands of years. In recent history, however, this arrangement has increasingly given way to secular states that moved away from official relationships with religion towards varying types and degrees of independence. Whereas almost ninety percent of the territories corresponding to today's nation states were under a state religion at the beginning of the seventeenth century, the fraction has fallen to below twenty-five percent by the twenty-first century.

Although researchers have recently studied state regulation of religion in isolated episodes in history, and more comprehensively in today's societies and in recent history, the literature lacks systematic analysis of the rise of secular states during the period before the twentieth century. Among recent studies, Barro and McCleary (2005) have identified countries with a state religion in 1900, 1970, and 2000, and used cross-national data to investigate the factors contributing to the likelihood of state religion in 1970 and 2000. Fox (2008) has constructed a "Religion and State" dataset to examine how government involvement in religion has differed among countries and changed during the period between 1990 and 2008. Coşgel and Miceli (2009) have similarly used cross-national data to study forces affecting a government's decision to establish a state religion or to support, control, or suppress religion at the beginning of the twenty-first century. However, the nature, timing, and correlates of the secularization of states during the modern era has yet to be identified.

In this article we offer a systematic analysis of the evolution of secular states based on an argument that considers religion as a legitimizing force for political leaders and examines the factors affecting the cost and benefits of alternative sources of legitimacy. We also examine the argument empirically by tracing the significant patterns and causal relationships in the adoption of secular and religious states since the year 1000.[1] Our empirical analysis uses a unique time-series cross-national dataset that includes annual information on the political and religious histories of today's nation states. By necessity, the analysis uses an admittedly narrow concept of secularism; namely, whether a state has an official religion, either by decree or based on evidence indicating a specific role of religious authorities in the apparatus of government. This definition is dictated by the available data (or lack of it), which necessitated an all-or-nothing definition for what is in reality a complex relationship. We believe, however, that the sacrifice in generality is more than compensated for by the scope of the analysis.

We first use the data to demonstrate two fundamental transformations that have taken place since 1000: the shifting adherence from indigenous to missionary/universal religions, and the development of secular states. We then use regression analysis to determine the influences on the adoption of a secular state, such as the degree of concentration in the religion market, ethnic and religious differences between rulers and the general population, historical inertia of a state, and the prevailing political regime. To identify the effect of religious concentration on the secularization of states, we implement an instrumental variables strategy that exploits the variation among territories in their distance to religious centers of the world, the first use of such an instrument in the literature. Specifically, we postulate that the farther was a territory from the center of a so-called "missionary religion," the lower would be the possible influence of that religion in causing a more concentrated religion market. Using this strategy, our results show that concentration in the religion market influenced the secularism of states negatively, as

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[1] For a recent study that goes even further back in time, see Vaubel (2015).

expected. But the effect was reversed and rose in magnitude if the ruler had a different religion than the general population, indicating that the presence of such a difference in a monopolized market likely had a delegitimizing effect by facilitating resistance against the ruler. Consequently, the net effect of religious concentration on secularism was positive in such circumstances, a novel result identified by our instrumental variable analysis.

Our results are closely related to the recent literature on the state regulation of religion. For example, Gill (2008) has proposed a theory that depends on the political self-interest of government officials, and he has used the resulting predictions to explain state-religion relationships in the early United States and in Latin America during the 1800s. Building a model to compare theocracies with secular governments, Ferrero (2013) has offered evidence to explain the rise of theocracies in Ancient Israel and among Muslim countries in the twentieth century. In an analysis closest to our project, Johnson and Koyama (2013, 2016) have studied the relationship between the centralization of state institutions and increased religious toleration in medieval and early modern Europe. Developing a model to identify the conditions under which legal centralization raises the cost of religious persecutions, they have offered an argument for the birth of the secular state in Europe and supported it by historical evidence consisting of two case studies drawn from French history. We contribute to this literature by offering a comprehensive historical analysis of the relationship between state and religion since the year 1000, and by identifying the factors affecting the secularization of states during this period.

Our analysis is also related to the secularization debate, which has so far been typically framed as a matter of the religious beliefs and behavior of individuals, rather than the actions and policies of states, in the modern era. Whereas most seminal social thinkers of the nineteenth century argued that the importance of religion would gradually disappear in people's lives, this argument has recently come under serious criticism by social scientists who have

found evidence that religiosity has instead risen in some societies.[2] Because the indicators of religiosity include state policy and its influence on the behavior of people, an important component of the secularization debate is the historical or current presence of state religion in a society. We contribute to this debate by updating the knowledge regarding the historical evolution and correlates of the rise of secular states.

2.   Religious vs. Secular State: A Simple Model

To express the basic argument in a simple framework, we develop a political economy model of secularism that is centered on the notion of legitimacy. Consider the interaction between the ruler and an agent whose role it is to support, or legitimize, the ruler. The agent could represent a religious authority (e.g., the Catholic Church, the Caliphate) or a secular authority (e.g., landlords, the intelligentsia, the military). The citizenry produces a gross surplus, Y, that is limited by resources and technology. The objective of the ruler is to extract as much of that surplus as possible for his private consumption.

Although legitimacy may serve many functions, we focus on its role in increasing the ruler's revenue. Suppose that the ruler imposes a nominal tax rate of t on the citizenry, so that under conditions of perfect compliance, total tax revenues would be tY.[3] In reality, however, enforcement costs and corruption will dissipate a fraction δ of each tax dollar, yielding the ruler net taxes of $(1-\delta)tY=\beta Y$, where $\beta\equiv(1-\delta)t$ is the effective tax rate. The role of legitimizing agents in this setting is to support the ruler so that citizens are more compliant in paying taxes. In

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[2] For reviews of this debate and recent contributions, see Fox (2008: Chapter 2), Franck and Iannaccone (2015), and Norris and Inglehart (2004).
[3] We treat t as fixed, but in a fuller model, it presumably would be the rate that drives citizens to their reservation utility (see, for example, Coşgel and Miceli (2009)).

particular, greater legitimacy will tend to reduce $δ$, resulting in a higher value of $β$, and hence more revenue.

In this setting, the ruler selects among agents to derive its legitimacy, which generally involves monitoring costs, and/or the payment of bribes to ensure that those agents will act in the interests of the ruler. Let C_j be this cost, where $j=r$ and s denote religious and secular sources of legitimacy, and suppose for simplicity that these two sources are incompatible so that the ruler has to choose between them.[4] Note that $β$ will also depend on the choice of a legitimizing agent, as will be detailed below, so that net tax revenue is given by $β_j Y$ under regime j ($j=r,s$). Putting all of this together, the ruler would choose secular legitimacy if

$$β_s Y - C_s > β_r Y - C_r, \text{ or}$$

$$(β_s - β_r) Y > C_s - C_r. \tag{1}$$

That is, the ruler would prefer a secular state if he expects this choice to add more to his revenue than its cost, as compared to having a state religion.

In this simplified setting, the ruler's choice would depend on how the transition from religious to secular state would affect his legitimacy ($β_j$) and the transaction cost of monitoring and paying off the agents (C_j). To see how these variables can vary over time and between societies, and how these variations would affect the ruler's choice between secular and religious states, consider the following observations regarding some of the key determinants of the comparative advantage of religious authorities in providing legitimacy. We particularly highlight the effects of concentration in the religion market, the shift in monitoring costs incurred during the transition from a religious to a secular state, and ethnic and religious differences between

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[4] In Johnson and Koyama (2013) and Cosgel, Miceli, and Rubin (2012b), the ruler is able to choose the optimal mix of these two legitimizing inputs. Here we focus on the simple case where he has to choose one or the other. See also Greif and Rubin (2015) for endogenous political legitimacy in the English case.

rulers and the general population, in order to derive implications for the empirical analysis that will follow.

Consider first the role of the degree of concentration in the religion market, a key determinant of the comparative advantage of religious authorities to confer legitimacy on the ruler (Coşgel and Miceli, 2009). In a highly-concentrated market, religious authorities would have greater monopoly power to devote resources to supporting the ruler and greater freedom to determine the provision of religious goods and services for this purpose. Moreover, a monopolized religion market will command the entire populace, and the single provider will therefore be able to offer much broader and more easily obtained support for the state. In contrast, a competitive market where multiple religions (or sects) compete for the loyalty of citizens will dilute the power of any one provider to confer legitimacy. Choosing one of these religions as the state religion will only serve to legitimize the state with the devotees of that religion and therefore will be less effective as compared to a monopoly religion.

Religious legitimacy in a concentrated market will only work, however, if the ruler shares the same religion (or sect) as the general population. If the ruler has a different religion, a monopolized market may in fact have the opposite effect on the legitimacy of the ruler because the market power of the single provider may in this case facilitate resistance against the ruler. Rather than risk de-legitimacy by relying on uncertain cooperation with the leaders of a different religion, the ruler would be better off establishing a secular state.

Consider next how the ruler's choice between a secular and religious state would be affected by the transaction cost of monitoring the legitimizing agents. Since religious and secular authorities have their own objectives, which likely differ from those of the ruler, the ruler would have to incur a kind of agency cost to ensure that they exert the optimal level of effort to maximize his legitimacy. We would expect this cost to vary between religious and secular authorities depending on the degree of alignment between their objectives and that of the ruler.

Although for simplicity we have not specified the objective functions of agents in the model, it is intuitively reasonable to expect the alignment with the ruler's objectives to be highly correlated with the degree of entrenchment of the agent's institutions with the state. That is, the cost of monitoring would be lower for agents whose institutions are historically more deep-rooted with the state.

Deep-rooted institutions persist through path dependency. Establishing rules and roles is a learned process, and whether imitated, borrowed, or spontaneously created, it is expensive and evolves over time. But such rules have the unique property of being more refined and more ingrained through repeated use as opposed to wearing out like physical capital (David, 1994). Furthermore, institutions serve as coordination devices by establishing standards, and standards are hard to break and can lock-in such establishment (David, 1985). That is, they become 'carriers of history' in that the laws or conventions of today depend partly on the process of getting here (North, 1991). These institutional structures, being more rigid to changing environments, create incentives for their members to alter the external environment to maintain their structure for these reasons (David, 1994).

It follows that deeper rooted states have deeper rooted institutions, implying the further back we go the tougher the distinction between function and tradition. This becomes significant with respect to religion and its institutions, which also solve coordination games among large networks. If these standards enhance the legal apparatus, they are absorbed, as was often the case in areas like taxation and education. This causes religious authorities to align with political rulers in preserving tradition. Such historical inertia motivates the prominence of state religion and how the secular alternatives presented by the Enlightenment changed this political equilibrium over time, as we show in more detail below. A related implication is how the cost of

monitoring would affect the differential adoption of a secular state between countries.[5] Given the stronger historical inertia associated with the prominence of religion and the correspondingly stronger alignment of interests with the traditional equilibrium in long-established states, we would expect that countries with a longer history of state inertia to be less likely to transition to secular statehood, all else being the same.[6]

Note, however, that the alignment of interests and the cost of monitoring the legitimizing agents in long-established states would depend on whether the ruler is native or foreign. If a colonizer seeks to acquire legitimacy from religious authorities in long-established states, he would have to spend additional resources to ensure that these authorities do not form alliances with resistance against the new regime. Since a foreign ruler would not have the same vested interests in traditional institutions as native rulers, it may be prohibitively costly for him to implement stable legitimizing relationships with native religious authorities, and instead more effective to transform indigenous institutions towards a secular state. The historically entrenched interests of religious authorities may thus have the opposite implication regarding the cost of monitoring in colonial territories. As a result, we would expect that in territories with a long presence of a state and governed by a foreign ruler, it might be cheaper (and therefore optimal) to use secular authorities for legitimacy.

Finally, regardless of the depth of historical state inertia in a territory, we would expect state secularism to depend on the current political regime through ideological or global considerations. A communist regime, for example, may be openly hostile to religious authorities

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[5] Because of our focus on religious and secular loyalty, we ignore the effect of military changes on legitimacy during this period. Military authorities legitimize the ruler through fear, which we consider as equally consistent and complementary with both religious and secular loyalty.

[6] A counter-argument, suggested by a referee, is that a state with a longer history could more easily dispense with religion as a legitimizing force because it has established its own intrinsic legitimacy. While this argument makes sense, we maintain that if the state's legitimacy was originally founded on religious grounds, its institutions would have become so enmeshed with religious symbolism that it would be difficult to eschew their influence.

and organizations, and seek to replace religion with secular ideologies and institutions in public life. Religious policies of colonial regimes were often driven by global considerations. A colonial ruler in close alliance with an international religious organization, such as the Catholic Church, may seek to extend the alliance in newly conquered territories by establishing a state religion under this organization. In contrast, a secular state may be more suitable for another colonial power that is more interested in swift extraction of wealth and resources. The choice between secular and religious state in such territories may depend more on global political and economic considerations than local revenue maximization.

3.   Description of the Data

In order to conduct a systematic analysis of the relationship between state and religion over time, we have developed a unique dataset called "Historical Polities Data (HPD)," which includes annual information on the territories occupied by today's nation states since the year 1000 (Coşgel, 2016). To gather information regarding the political and religious characteristics of these territories during this period, a team of research assistants combed through a wide variety of sources, giving priority to sources with comprehensive coverage, such as Encyclopædia Britannica, the "Country Studies" collection of the Library of Congress, and the book series "Cambridge Histories Online" in cases of conflicting information about a particular variable. Rather than restrict the dataset to territories of certain size, duration, or type, we included all territories for which we could find complete information. The final set includes time-series cross-section data, with a long panel structure, on 191 territories corresponding to today's independent countries since the year 1000.[7]

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[7] Regression analysis uses data from only 143 territories due to the lack of matching data from other sources.

For each territory and year, the HPD identifies significant religious groups in the general population. The main religion is defined as the one that had the highest percentage of adherents. The benchmark to determine whether other significant religious group existed is whether the secondary religion's population share exceeded ten percent, if this information was available. For recent centuries, estimates of population shares of religious groups can be found in Brown and James (2015), which in some cases goes back to the 1700s. For earlier centuries, we used non-quantitative information from our sources to identify the main religion and to determine whether a significant secondary religion existed.

In addition to describing the identities of religious groups verbally, we categorized them into groups to facilitate systematic analysis. For indigenous religions, we recorded as much specific information as available regarding differences within a territory, but we coded them under a single category to maintain a consistent standard across territories. We did not differentiate, for example, among the varieties of Chinese folk religions or among the branches of Hinduism that have developed in India over the centuries. In the same vein, we used the coding standards of recent data on historical religious populations by treating broad categories of sects in Islam (Sunni, Shia, Kharijite) and Christianity (Catholic, Orthodox, Protestant) as distinct religions, but we did not further differentiate among the subcategories of these groups.[8]

To enter information regarding the political and religious characteristics of rulers, we identified the polities that ruled each territory since the year 1000. A basic question was the presence of a state in a territory. After using our own sources to code the presence of a state, we checked it against Putterman's "State Antiquity Index" (Bockstette, Chanda, and Putterman, 2002) to eliminate (minor) discrepancies.[9] The contents of the HPD regarding state antiquity

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[8] Any categorization of religions is inherently problematic due to the difficulties of comparison and standardization across different traditions. Rather than introduce bias by implementing our own criteria, we simply used the broad categories commonly used in recent quantitative studies.
[9] The "State Antiquity Index" also includes variables on the ruling government's relationship to the territory. More specifically, the index is based on (1) whether a government existed above the tribal level,

differs from Putterman's dataset in two respects. Whereas the State Antiquity Index provides information for only the dominant government in a territory and for periods of 50 year intervals, the HPD has more comprehensive coverage that includes other governments and all years. Although territories were sometimes ruled entirely by a single government, the situation was more complicated when two or more polities coexisted, either warring over total control in a territory or ruling adjacent lands within it. In such cases, we applied the criterion of identifying the main government as the one controlling the largest or most important portion of the lands comprising the territory, consistent with the State Antiquity Index. Whereas the information regarding dominant governments in a territory's history may be sufficient for the sole purpose of measuring the state antiquity of a modern country, for a more complete picture of its political and religious history we provide more extensive coverage that includes as much information as possible regarding other governments that coexisted in the territory. Moreover, HPD includes information regarding the characteristics of both main and secondary governments on an annual basis.

After determining the presence of a state in a territory, we coded variables regarding the secularism of the state and the religions and origins of political rulers. Once we determined the dominant and secondary polities in a territory each year, we recorded the religions of the rulers of these polities based on the same system of coding that we used for the religious groups in the general population. We also recorded the original territory of the ruler to determine differences, if any, from the native population. Although religious and original differences sometimes coincided, such as during the Ottoman rule in the Balkans, in other cases only one of these differences was present, for example during Ottoman rule in the Arab lands that were populated mainly by coreligionist Sunni Muslims.

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(2) whether it is foreign or locally based, and (3) the approximate proportion of the territory of the modern country that was ruled by this government.

Regarding the presence of a secular state, we coded this as a dummy variable defined simply by the absence of an official religion in the dominant polity ("Secular State" = 1 if there is no state religion, =0 otherwise). In coding the possibilities corresponding to the absence of an official religion, Fox (2008) has identified six different ways in which the separation of state and religion has taken place in recent years in his dataset. These possibilities range from hostility and overt persecution of all religions to state endorsement of a religion as civil (but not official) religion. Ideally, we would have preferred to use the same categories to extend the coding of these variables back in time, but we lack the information to do so consistently and comprehensively. Although the absence of a state religion may thus involve various types and degrees of interaction between state and religion, we chose to code secularism as an all or nothing variable based on a simple standard that can be applied feasibly and consistently to all years and territories. In many cases, we were able to code this variable based on the existence of an official declaration regarding the disestablishment of state religion at a certain time, thereby offering clear evidence of its presence previously and absence afterwards. In addition, we used a variety of corroborating evidence, such as the presence of a law/decree favoring one religion over others and the official role of clergy in government, to determine or confirm the existence of a state religion. If no clear evidence could be found to indicate the existence of a state religion, we considered such a territory as secular.

Given the ambitious scope and broad temporal and geographic coverage of the HPD, the final product includes various imperfections and missing data caused by the difficulty of gathering and interpreting the required information. As noted above, we defined some of our variables in a binary format or based on broad categories in order to ensure consistency across territories and time periods. Although some of our procedures may have caused errors in measurement, we do not believe that these errors have biased our results systematically. We have missing observations on the early histories of territories for which we lack written records

or clear archeological evidence on their political or religious characteristics. For example, we know too little about the population or organization of many African societies prior to colonization to determine with a high degree of certainty the characteristics of their governments or religions and whether they had an official religion. The same can be said for many societies in Oceania and the Western Hemisphere before the fifteenth century. Rather than base our coding on questionable assumptions about the organization of these societies or make ad hoc assumptions about the relationship between their political and religious authorities, we have decided to omit such unknown episodes of their history from the analysis.[10]

4.   Religion, State, and Secularism since the Year 1000

We now use the Historical Polities Data to identify significant changes in the religious make-up of the world. Table 1 shows the distribution of entries in the HPD by continent and main religion in the years 1000 and 2000, the beginning and end dates of our investigation. As seen in the table, there was a fundamental shift in the main religions of these lands from indigenous religions (e.g., traditional African or Eastern) towards Islam, Christianity, and Buddhism, which are generally referred as missionary/universal religions. The transition towards Abrahamic faiths is particularly striking in the spread of Islam in Asia, Christianity in Oceania and the Western Hemisphere, and both Islam and Christianity in Africa during this period. Although we did not include the regional breakdown of these trends in the table, our data reflects the spread of Islam mainly in North Africa and Christianity in sub-Saharan Africa.

The data can also be used to investigate how the presence of religious versus secular states changed over time. As noted, Barro and McCleary (2005) have found that the fraction of states with monopoly religion fell sharply between 1900 and 1970 and stayed about the same

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[10] See Coşgel (2016) for a detailed discussion of the development of "Historical Polities Data" and its limitations and areas of further development.

between 1970 and 2000. As Table 2 shows, the rising incidence of secular states that Barro and McCleary observed in the twentieth century was part of a longer trend that started much earlier. Tracking the territories corresponding to today's nation-states back in time, we see that the fraction with secular states fell somewhat between 1000 and the twelfth century, remained low until about seventeenth century, and rose steadily thereafter. The fall in the fraction from 83 to 77 percent between 1950 and 2000 corresponds to choices made by many new states that were previously under colonial or communist rule in 1950 to adopt an official religion after gaining independence.

Going beyond broad observations, we now examine whether the observed trends in the rise and fall of the aggregate fraction of secular states varied among religious traditions. Figure 1 shows how the fractions of state religion changed over time when broken down by main religions (using the same categories as in Table 1). Lands occupied by majority Muslim populations started off our period dominated by state religions, and they maintained this low level of secularism until about 1800, despite a notable rise between about 1100 and 1300. Although the Christian world also started the period with a very low fraction of secular states, the fraction started to rise after about 1600, two centuries before the rise began in the Islamic world. The rise was sharp in all religious traditions after about 1800. The fraction of secular states was similarly low in the Buddhist world and remained so until about the middle of the nineteenth century. In populations with other religions, by contrast, the fraction of secular states was on average significantly higher than among all missionary religions throughout our period, being around 40 percent until about the eighteenth century, followed by a continual sharp rise.

5.   Regression Analysis

We now turn to regression analysis of the empirical implications of the model by using the Historical Polities Data and variables from other sources on the historical and geographic

characteristics of countries. The dependent variable is the presence of a secular state, a dummy variable as described above. We focus on the three sets of key independent variables that were identified in the model, namely the concentration in the religion market and its interaction with different-religion ruler, the historical inertia of the state and its interaction with foreign ruler, and the political regime. Since this formulation may suffer from endogeneity problems regarding omitted variables, we first run simple OLS to obtain baseline results and then use an instrumental variables approach to address endogeneity concerns.

We consider the effect of religious concentration through a dummy variable that depends on the presence of strong monopoly power in the religion market. More specifically, "Concentrated Religion Market" equals one if the general population of a territory does not include a secondary religion, a variable described in the previous section. To consider the differential effect of concentration under religious differences between the ruler and general population, we interact this variable with a dummy variable reflecting whether the ruler's religion is different from the main religion, as detailed below.

We measure historical state inertia through an index based on recent empirical studies of the deep roots of current outcomes. More specifically, we modify the basic structure of the "State Antiquity Index" of Bockstette, Chanda, and Putterman (2002) to define an index of historical state inertia at time T as follows:

$$ HSP_T = \frac{1}{\alpha} \sum_{t=1000}^{T} (1 + \rho)^{t-T} S_t \qquad , \qquad (2) $$

where S_t is a dummy variable that measures state presence (=1 if the territory was ruled by a state at time t), and α is a normalization parameter such that $\alpha = \sum_{t=1000}^{T} (1 + \rho)^{t-T}$. We consider the effect of time through ρ, a discount rate, such that $\rho \geq 0$. If $\rho=0$, HSP_T puts equal weight on all historical periods, while $\rho > 0$ emphasizes the more recent periods. The resulting

index ranges from 0 to 1.[11] As noted, we consider the differential effect of state inertia under a foreign ruler by including an interaction term that equals $HSP_T * FR,$ where the latter is a dummy variable for foreign ruler (=1 if the ruler's territory of origin is different from this territory).

The third set of key variables concerns the effect of the political regime. Based on the discussion of this effect in the model section, we include a set of variables that depends on whether a state was controlled by a communist regime or by some of the prominent colonizers that controlled vast territories. These variables will demonstrate the effects of ideological and global strategies on the secularism of territories.

In addition to key variables of interest, we include year (log) in the baseline analysis to control for unobserved effects due to changes over time. This allows us to exploit the time dimension of our data by considering the effects of unit-invariant changes over time. Each year contains various unobserved temporal characteristics, such as contemporary technology and knowledge. Through this variable, we are able to control for systematic trends in the world that may have caused state secularism to change over time.

We also include various other variables to control for their influence on the adoption of secular state, such as standard geographical variables measuring the average precipitation, temperature, and elevation of territories, and historical variables regarding the duration of settlement and timing of Neolithic transition.[12] Appendix A reports the summary statistics of these variables.

Table 3 shows the results of the baseline OLS analysis of influences on the secularism of states.[13] Because the observations in our cross-country setting may be correlated within

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[11] See also Coşgel, Miceli, and Yildirim (2016) for an application of this index to measure historical religious difference between rulers and religious groups.
[12] For the definitions, construction, and original sources of geographic and historical control variables, see Ashraf and Galor (2013a and 2013b).
[13] We estimated the model using the xtreg function of Stata. Using xtprobit yields consistent results.

territories, we clustered the errors at the level of territories. The table includes several combinations of the key variables with control variables to check for the consistency of our results to alternative specifications.

The OLS results support our arguments regarding the way concentration in the religion market, historical inertia of state, and political regimes affected the secularism of states. The coefficient of "Concentrated religion market" is negative and significant as expected, indicating that the presence of a concentrated religion market influenced the adoption of religious over secular states by enhancing the comparative advantage of religious authorities to confer legitimacy on the ruler. In addition, the coefficient of the interaction of this variable with a dummy variable regarding the presence of a religious difference with the ruler ("Concentrated religion market * Different-religion ruler") is positive as expected. Though not significant at conventional levels, the positive sign of this variable indicates that the presence of such a difference in a monopolized market might have a delegitimizing effect by facilitating resistance against the ruler. Given the OLS estimates of these influences, we would expect the net effect of religious concentration on the secularism of states in territories governed by rulers that differed in religion from the general population to be positive. For example, the net effect (in comparison to situations of same-religion rulers and non-concentrated religion markets) is -0.088 + 0.075 + 0.064 = 0.051 in the first equation. Because of our concerns regarding the endogeneity of concentration, however, for now we offer the arguments regarding the effect of religious concentration tentatively, and examine them more fully in the next section.

The results for the historical inertia of state are parallel to those for market concentration, and in expected directions. Having a long-established state had a negative influence on secularism because of the greater alignment of the interests of religious authorities with those of the ruler in such states. The effect is reversed, however, if a territory is governed by a foreign ruler, because his objectives would then clash with those of native legitimizing agents, as implied by the theoretical argument presented earlier. Since the latter effect is significantly

smaller than the sole effect of the historical inertia of state, the net effect in the presence of a foreign ruler is still negative.

Our results regarding the effects of political regimes are also interesting and in expected directions. The signs and significance of the coefficients of "Communist regime" and variables that control for imperial territories show the differential policies of these regimes regarding secularism. Not surprisingly, the presence of a communist regime favors the adoption of secular state, consistent with the finding of Barro and McCleary (2005). Whereas the Ottomans, Spanish, and the Portuguese imposed official religions in their territories, being governed by the French or British empires had no significant influence on the secularism of a territory, all else being the same.

Interestingly, other than the generally positive and significant coefficients of "Year (log)", which is consistent with the rise of secular states shown in Table 2 and Figure 1, other control variables had no significant influence on secularism. The coefficients of geographic and historical variables are mostly insignificant, and their inclusion changes the coefficients of key variables only slightly, indicating that they had little effect on secularism in this formulation. This is an interesting result in light of recent literature giving prominence to geographic and historical factors in explaining social phenomena (Spolaore and Wacziarg, 2013).

6.   Addressing Endogeneity Concerns

We ran the baseline OLS regressions based on the presumption that the key explanatory variables are determined exogenously. There is reason to suspect, however, that some of these variables may suffer from an endogeneity problem that needs to be addressed. In particular, there might be an omitted variable bias in estimating the effect of concentration in religion market, caused by unobservable characteristics of territories that have affected

concentration as well as secularism of states. In that case, the results of OLS regressions reported in Table 3 may be biased, underestimating the magnitude of the influence of religious concentration on state secularism if the effect of omitted variables on religious concentration has the same sign as their effect on secularism.

Our OLS result regarding the negative effect of religious concentration on secularism is consistent with those of Barro and McCleary (2005) and Coşgel and Miceli (2009), who previously found a positive association between concentration and state religion in the twentieth century. Citing the difficulty of finding suitable instruments, however, previous studies have either ignored the endogeneity of concentration, or they have dealt with the problem simply by using long lags of this variable as an instrument. The concern with endogeneity here is that the negative association between concentration and secularism commonly found in these studies may not necessarily mean that low concentration caused secularism if the inhabitants of these societies have collectively made choices that determined the level of concentration in the religion markets rather than being assigned concentration exogenously. Differences among territories in both concentration and secularism could be caused by unobserved characteristics, such as traditional values regarding religious tolerance. As a result, societies with certain characteristics may not only be particularly suited to have low (high) concentration in religion markets but a lower (higher) likelihood to have a secular state as well.

The concern with the endogeneity of concentrated religion market extends to another key variable in our analysis, namely, the interaction of concentration with "Ruler different religion." Although the interaction term may be exogenous, the combined effect of the two variables may still be biased because of the endogeneity between concentration and secularism. As a result, the positive coefficient of "Concentrated religion market * Ruler different religion" estimated by OLS may be underreporting the true magnitude of this effect if the omitted

variables are correlated negatively (positively) with "Concentrated religion market * Ruler different religion" and positively (negatively) with secularism.

We thus need to mitigate the omitted variable bias to identify the true effect of concentration in the religion market. Note that the task is made more complicated by the binary specification of concentration and its inclusion in another variable through an interaction term as discussed above. Moreover, given the cross-national time-series structure of our data, we have to identify differences in religious concentration not only between territories but over time as well.

We deal with these concerns by employing an instrumental variables method of estimation. The main instrumental variable that we propose is the aerial distance of a territory to the center of the closest missionary religion, as described in more detail below.[14] To deal with the ("forbidden regression") complications caused by the binary format of concentration and its inclusion in a second variable through an interaction term, we follow the strategies proposed by Wooldridge (2010: 262-68). More specifically, we specify "Concentration in religion market" and "Concentration in religion market" * "Ruler different religion" as the two endogenous variables, and use a 2SLS method of estimation by employing as instruments "Distance to closest missionary religion" and the interactions of this variable with "Ruler different religion" and "Year." Given the time-series dimension of our data, we include year in this analysis to capture the systematic effects of temporal variations, such as improvements in communication and transportation technologies, on religious concentration. We report the first stage results of influences on the two dependent variables in Table 4.

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[14] We opted for aerial distance versus "travel cost" distance because of the ease of measurement, and recognizing that any errors arising from this simpler measure would not likely be systematic, nor would they necessarily be greater than those that would arise from attempting to construct the more complicated measure for the entire world. In the same vein, we opted for the simple distance to the nearest missionary religion that gave us good results as a predictor of concentration versus a more complicated measure that would consider both proximity to the nearest religious center and distance from other religious centers.

Although researchers have recently used distance as an instrumental variable in various types of empirical research (e.g., distance to nearest school as an IV for education), we believe this is the first paper that uses aerial distance to religious centers as an instrument for religious diversification. Based on our observations regarding the increasing dominance of missionary religions in the religion market during our period (Table 1) and the presumption that each religion's expansion originated in its birthplace and progressed linearly to other regions, we propose to exploit differences in the aerial distance of each territory to the centers or birthplaces of missionary religions as a suitable instrument for regional differences in concentration in the religion market.[15] These capitals are Bodh Gaya, India (Buddhism); Wittenberg, Germany (Protestanism); Istanbul, Turkey (Orthodox Christianity); Jerusalem, Israel (Judaism, Christianity); Karbala, Iraq (Shia Islam); Mecca, Saudi Arabia (Islam); Muscat, Oman (Khawarij Islam); and Vatican City (Catholicism).[16]

The distinction that we attribute to missionary religions and our findings regarding their expansion over time are consistent with the literature on the history of religions. Scholars of religion, including Max Mueller in a lecture in 1873 and Ugo Bianchi over a century later in an entry on the history of religions in *The Encyclopedia of Religion*, classified religions into two categories (Sharma, 2012). The "universal" or missionary religions of the world (Buddhism, Christianity, and Islam) in the first category are distinct from others "because they are not linked to blood, racial, ethnic, or national groups, and anyone can join them." In addition, these religions shared the distinct characteristics that each was "founded by a historic person who synthesized a variety of teachings current during his lifetime and created a new path," provided

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[15] Cantoni (2012) finds the distance to Wittenberg to be a significant determinant of the adoption of Protestantism. On the expansion of Islam, see Michalopoulos, et al. (2012, 2016). See Ashraf and Galor (2013) for an argument regarding the relationship between human genetic diversity and the distance from the cradle of humankind in East Africa.

[16] We have had greater difficulty of identifying single centers for decentralized religions like Hinduism and Protestantism than for religions like Catholicism that have had a definite and persistent historical center. For some of the decentralized religions, researchers may find it more appropriate to use other places of central importance because of differences in context and topics of inquiry.

"saints or other intermediaries to help believers reach or realize salvation," and offered ways to "address and deal with the everyday problems and insecurities that people are experiencing." (Johnson and Johnson, 2007: 6-7).

Given the enormous expansion of Buddhism, Christianity, and Islam during our period, it is easy to see that a territory's geographic proximity to the centers of these religions could be a significant exogenous determinant of their ability to enter its religion market and affect concentration. As noted, we use the variable year (log) to control for the effects of the expansion of these religions over time. Regarding differences between territories, our hypothesis is that the farther is a territory from the capitals of missionary religions, the lower will be the concentration in its religion market due to the restricted dominance of missionary religions.

The first stage results reported in Table 4 confirm our arguments regarding the effects of distance on concentration in the religion market. The coefficient of "Distance to closest missionary religion" is negative in the first equation, as expected. The interactions of this variable with year and religious differences also yield interesting results, or possibly due to the dissipation of missionary activities over time. The coefficient of the interaction of concentration with "Year (log)" is positive, indicating that the negative effect of distance on concentration decreased over time, likely due to advancements in transportation and communications technologies that reduced the importance of distance. The coefficient of the interaction of distance with "Ruler different religion" is also positive, indicating that the postulated effect of distance on concentration was reversed in territories governed by rulers of different religion.

The results of first stage analyses reported in Table 4 confirm the validity of distance to missionary religions as an instrument for concentration in the religion market and that of the interaction of this variable with "Ruler different religion" as an instrument for the second endogenous variable (column 2). Overall, the exogenous variables explain about 25% of the variation in concentration in the religion market and 38% of the interaction of this variable with

religious differences between rulers and the general population. The F-statistics for excluded instruments are 1,515.91 and 2,769.29, both highly significant.

We believe that the exclusion condition is satisfied because there is no direct causal link in scripture or common practice between missionary religions and the secularism/religiosity of states. Official religions were established long before the arrival of missionary religions, as observed in Ancient Near East and numerous city-states around the world. The direct link has been weak even during the period since the arrival of missionary religions, as societies populated by the adherents of missionary religions have not all had state religions or had them as a matter of direct religious mandate or shared practice. Although it is difficult to demonstrate the lack of a direct relationship between the distance to missionary religions and state secularism, we believe that the only reasonable link is through the concentration channel, i.e., the greater ability of religion to provide legitimacy under state religion in highly concentrated markets.

Table 5 shows the results of instrumental variable analyses for the basic model that includes only the key variables, and for models that also include geographic and historical variables. When we compare the OLS (Table 3) and 2SLS results, we see no major changes in the coefficients and significance of variables related to historical state inertia and political regime. The results regarding the effect of religious concentration, however, have changed drastically. The IV estimate of the coefficient of "Concentrated religion market" is more than double the OLS estimate in the baseline model, a drastic rise observed in other models as well. Even more drastic is that the coefficient of "Concentrated religion market * Ruler different religion" has risen almost eight-fold and is now a highly significant influence on secularism. As a result, the net effect of religious concentration under the presence of religious difference between political rulers and the general population is still positive but now has a significantly higher magnitude, an indication of a commonly observed major downward bias in the OLS

estimates. In the baseline model, for example, the net effect (in comparison to situations of same-religion rulers and non-concentrated religion markets) is now $-0.225 - 0.153 + 0.542 = 0.164$ as compared to .051 in the OLS model.

We conclude that, once the omitted variable bias is appropriately mitigated, the results of instrumental variable analysis indicate a stronger influence of religious concentration on secularism. These results are thus consistent with the findings of Barro and McCleary (2005) and Coşgel and Miceli (2009) regarding the relationship between concentration and state religion in the twentieth century, and indicate the presence of this relationship during the period leading up to the twentieth century. In addition, our results highlight another influence on secularism that works through the legitimizing function of religion versus secular forces, namely, the role of religious differences between political rulers and the general population. Historically, states were more likely to be secular in territories that were governed by rulers who differed in religion from the general population, a mechanism that contributed significantly to the development of secularization over time.

Overall, we believe that our analysis contributes to our understanding of the complex relationship between state and religion, two of the oldest of human institutions. Conventional wisdom has long held that the trend toward a secular state, which our data confirms, has been driven largely by the advance of science and the general increase in secularism throughout all aspect of society, a process that began with the Enlightenment. While not denying the validity of this argument, we believe that our results shed a different light on the forces that have shaped the trend to secularism. Specifically, we have highlighted political economy factors and the ever-present need for rulers to appear legitimate in the eyes of the citizenry as relevant factors. In this sense, the march toward secularism is not entirely one based on increasing rationality, with the consequent jettisoning of religious institutions from government. It is also, in

part, an evolving view, from the perspective of self-interested rulers, regarding the importance of those institutions as legitimizing forces.

7.   Conclusion

This article has offered a systematic analysis of the emergence of secular states, a drastic institutional transformation that has taken place in the modern era from the previous dominance of official religion as the most significant state monopoly in history. Using an argument that considered religion as a legitimizing force for political leaders, we examined the factors affecting the cost and benefits of alternative sources of legitimacy. To investigate the argument empirically, we used a novel dataset that allowed us to trace the significant patterns and causal relationships in the evolution of secular states since the year 1000.

Our empirical analysis showed that the main religions of the world underwent a fundamental transformation since the year 1000 from indigenous to missionary/universal religions. Another fundamental transformation was the drastic rise in the fraction of secular states after the seventeenth century. To examine factors affecting the adoption of a secular state, we used regression analysis that highlighted the variables identified by the theoretical argument, namely the degree of concentration in the religion market, historical inertia of a state, ethnic and religious differences between rulers and the general population, and the prevailing political regime.

To address endogeneity concerns, we implemented a novel instrumental variables strategy regarding omitted variables in the relationship between religious concentration and state secularism. Our strategy exploited the variation in the distance to religious centers of the world as the main instrument for religious concentration in a territory. Incorporating the interaction of this variable with a time variable (log-year) and the presence of religious

differences between political rulers and the general population, we were able to properly identify the effects of having a concentrated religion market and concentration under different-religion rulers. According to our results, although concentration in the religion market influenced the secularism of states negatively (with a larger magnitude than estimated by OLS), the interaction of this variable with the presence of religious differences between political rulers and the general population turned out to be positive and highly significant, giving rise to a positive net effect of religious concentration on secularism.

Our results regarding historical inertia of state showed that having a long-established state had a negative influence on secularism, but the effect was reversed if a territory was governed by a foreign ruler, a result similar to the effect of religious concentration. The net effect in the presence of a foreign ruler was still negative, however, because of the larger effect of historical inertia under these circumstances. Our findings regarding the effects of political regimes were also interesting and in expected directions, such as the positive effect of communism on secularism and the negative effects of being Spanish or Portuguese colonies. Also interesting was the general insignificance of the coefficients of standard geographic and historical variables, indicating that they had little effect on secularism in this formulation contrary to recent arguments regarding the prominence of such factors in explaining social phenomena.

Works Cited

Ashraf, Quamrul, Galor, Oded, 2013a. Genetic diversity and the origins of cultural fragmentation. American Economic Review, 103, 528-533.

------ 2013b. The 'out of Africa' hypothesis, human genetic diversity, and comparative economic development. American Economic Review 103, 1-46.

Barro, Robert J., McCleary, Rachel M., 2005. Which countries have state religions? Quarterly Journal of Economics 120, 1331-1370.

Bianchi, Ugo, 1987. History of religions. In: Eliade, Mircea, Adams, Charles J (Eds.) Encyclopedia of Religion, 2nd ed., Macmillan: New York.

Bockstette, Valerie, Chanda, Areendam, Putterman, Louis, 2002. States and markets: the advantage of an early start. Journal of Economic Growth 7, 347-369.

Brown, Davis, James, Patrick, 2015. Religious characteristics of states dataset, phase 1: demographics (RCS). Association of Religion Data Archives.

Cantoni, Davide, 2012. Adopting a new religion: The case of Protestantism in 16th century Germany. Economic Journal 122, 502-531.

Coşgel, Metin M., 2016. Historical polities data. Working paper 2016-16. University of Connecticut, Department of Economics.

Coşgel, Metin M., Miceli, Thomas J., 2009. State and religion. Journal of Comparative Economics 37, 402-416.

Coşgel, Metin M., Miceli, Thomas J., Rubin, Jared, 2012a. The political economy of mass printing: Legitimacy and technological change in the Ottoman Empire. Journal of Comparative Economics 40, 357-371.

------ 2012b. Political legitimacy and technology adoption. Journal of Institutional and Theoretical Economics 168, 339-361.

Coşgel, Metin M., Miceli, Thomas J., Yildirim, Sadullah, 2016. Religious differences and civil war. Working Paper. University of Connecticut, Department of Economics.

David, Paul A., 1985. Clio and the economics of QWERTY. American Economic Review 75, 332-337.

------.1994. Why are institutions the 'carriers of history'? Path dependence and the evolution of conventions, organizations and institutions. Structural Change and Economic Dynamics 5, 205-220.

Ferrero, Mario, 2013. The rise and demise of theocracy: Theory and some evidence. Public Choice 156, 723-750.

Fox, Jonathan, 2008. A World Survey of Religion and the State. Cambridge University Press, New York.

Franck, Raphael, Iannaccone, Laurence R., 2014. Religious decline in the 20th century West: Testing alternative explanations. Public Choice 159, 385-414.

Gill, Anthony J, 2008. The Political Origins of Religious Liberty. Cambridge University Press, New York.

Greif, Avner, Rubin, Jared, 2015. Endogenous political legitimacy: The English Reformation and the institutional foundations of limited government. Working Paper.

Johnson, Donald, Johnson, Jean, 2007. Universal Religions in World History: The Spread of Buddhism, Christianity, and Islam to 1500. McGraw-Hill, Boston.

Johnson, Noel D., Koyama, Mark, 2013. Legal centralization and the birth of the secular state. Journal of Comparative Economics 41, 959-978.

Michalopoulos, Stelios, Naghavi, Alireza, Prarolo, Giovanni, 2012. Trade and geography in the origins and spread of Islam. Technical Report No. 18438, NBER.

Michalopoulos, Stelios, Naghavi, Alireza, Prarolo, Giovanni, 2016. Islam, inequality, and pre-industrial comparative development,". Journal of Development Economics 120, 86-98.

Norris, Pippa, Inglehart, Ronald, 2004. Sacred and Secular: Religion and Politics Worldwide. Cambridge University Press, New York.

North, Douglass C., 1991. Institutions. Journal of Economic Perspectives 5, 97-112.

Sharma, Arvind, 2012. Religions: Missionary and non-missionary. In Sharma, Arvind (Ed.), Problematizing Religious Freedom, Vol. 9. Springer, New York, pp. 175-195.

Spolaore, Enrico, Wacziarg, Romain, 2013. How deep are the roots of economic development? Journal of Economic Literature 51, 325-369.

Vaubel, Roland, 2015. The making of state religion: political economy and historical evidence. Working paper.

Wooldridge, Jeffrey M, 2010. 2002. Econometric Analysis of Cross Section and Panel Data. MIT Press, Cambridge, MA.

Table 1
Main Religions in 1000 and 2000

Main Religion	Africa		Asia		Europe		Oceania		Western Hemisphere	
	1000	2000	1000	2000	1000	2000	1000	2000	1000	2000
Buddhism			9	10						
Christianity	3	24	5	6	35	37		11		35
Islam	8	22	18	25		2				
Other Religion	42	7	16	7	8	4	13	2	35	

Table 2
The Fraction of Territories under a Secular State between 1000 and 2000

Year	Number of territories under state control	Fraction secular
1000	95	0.14
1100	99	0.10
1200	105	0.14
1300	111	0.12
1400	118	0.14
1500	130	0.12
1600	149	0.11
1650	161	0.17
1700	167	0.20
1750	168	0.21
1800	173	0.28
1850	177	0.42
1900	191	0.64
1950	191	0.83
2000	191	0.77

Table 3

Influences on the Secularization of States

VARIABLES	(1)	(2)	(3)	(4)
Concentrated religion market	-0.0883*	-0.102**	-0.0883*	-0.102**
	(0.0490)	(0.0496)	(0.0490)	(0.0496)
Ruler different religion	0.0750	0.0741	0.0750	0.0741
	(0.0466)	(0.0473)	(0.0466)	(0.0473)
Concentrated religion market * Ruler different religion	0.0638	0.0725	0.0638	0.0724
	(0.0590)	(0.0590)	(0.0590)	(0.0590)
Historical state inertia	-0.855***	-0.857***	-0.854***	-0.857***
	(0.0965)	(0.0979)	(0.0972)	(0.0983)
Foreign ruler	-0.619***	-0.625***	-0.619***	-0.625***
	(0.0921)	(0.0926)	(0.0922)	(0.0926)
Historical state inertia * Foreign ruler	0.558***	0.565***	0.558***	0.565***
	(0.0939)	(0.0944)	(0.0939)	(0.0945)
Communist Regime	0.657***	0.636***	0.657***	0.636***
	(0.0544)	(0.0557)	(0.0544)	(0.0557)
Ottoman-controlled territory	-0.110***	-0.110***	-0.110***	-0.110***
	(0.0409)	(0.0414)	(0.0409)	(0.0414)
British-controlled territory	0.556***	0.558***	0.556***	0.558***
	(0.0671)	(0.0681)	(0.0671)	(0.0681)
French-controlled territory	0.588***	0.586***	0.588***	0.586***
	(0.0721)	(0.0722)	(0.0721)	(0.0722)
Spanish-controlled territory	-0.315***	-0.313***	-0.315***	-0.313***
	(0.0926)	(0.0929)	(0.0926)	(0.0928)
Portuguese-controlled territory	-0.312***	-0.315***	-0.312***	-0.315***
	(0.106)	(0.106)	(0.106)	(0.105)
Year (log)	0.208***	0.201***	0.208***	0.201***
	(0.0740)	(0.0761)	(0.0741)	(0.0762)
Total land area		4.35e-09		-1.27e-09
		(7.33e-09)		(7.47e-09)
Land suitability for agriculture		0.00951		-0.0161
		(0.0639)		(0.0637)
Mean elevation		0.0114		-0.0408
		(0.0669)		(0.0625)
Temperature		0.00273		-0.00166
		(0.00216)		(0.00255)
Precipitation		0.000117		-4.76e-05
		(0.000385)		(0.000342)
Migratory distance from East Africa		0.00455		0.0103**
		(0.00304)		(0.00463)
Terrain roughness		-0.111		0.0344
		(0.201)		(0.167)
Dummy for landlocked countries		0.0347		0.0275
		(0.0499)		(0.0502)

Log [Neolithic transition timing (ancestry adjusted)]			-0.0251	0.00869
			(0.0720)	(0.0601)
Settlement duration			0.00267	0.0133***
			(0.00460)	(0.00498)
Constant	-0.432	-0.473	-0.235	-0.563
	(0.545)	(0.571)	(0.859)	(0.780)
Observations	142,311	139,308	142,311	139,308
Wald chi-squared	743.8	1728	1394	2225
R^2(within)	0.388	0.391	0.388	0.391
R^2 (between)	0.753	0.785	0.758	0.797
R^2 (overall)	0.562	0.578	0.564	0.584

Notes:
1. The dependent variable is presence of secular state (=1 if yes).
2. Figures in parentheses are the robust standard errors.
3. * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 4

Distance to Missionary Religions and Religious Concentration: First Stage Results

VARIABLES	Dep. var: Concentrated religion market	Dep. var: Concentrated religion market * Ruler different religion
Distance to closest missionary religion (1000 m)	-0.341***	-0.110***
	(0.0469)	(0.0216)
Distance to closest missionary religion * Year(log)	0.0594***	0.0201***
	(0.00230)	(0.00151)
Distance to closest missionary religion * Ruler different religion	0.853***	1.247***
	(0.0486)	(0.0319)
Distance to closest missionary religion * Year(log) * Ruler different religion	-0.120***	-0.172***
	(0.00652)	(0.00428)
Historical state inertia	-0.258***	0.0215***
	(0.00691)	(0.00452)
Foreign ruler	-0.0366***	0.157***
	(0.00588)	(0.00386)
Historical state inertia * Foreign ruler	0.148***	-0.104***
	(0.00645)	(0.00424)
Communist Regime	-0.235***	-0.153***
	(0.00793)	(0.00521)
Ottoman-controlled territory	-0.0267***	-0.0292***
	(0.00437)	(0.00287)
British-controlled territory	-0.242***	-0.212***
	(0.00634)	(0.00416)
French-controlled territory	0.0552***	-0.0263***
	(0.00769)	(0.00505)
Spanish-controlled territory	-0.0360***	-0.100***
	(0.00591)	(0.00388)
Portuguese-controlled territory	-0.238***	-0.0822***
	(0.00832)	(0.00546)
Year (log)	-0.489***	-0.0672***
	(0.00658)	(0.00432)
Ruler different religion	-0.104***	0.467***
	(0.00398)	(0.00261)
Geographic controls	YES	YES
Historical controls	YES	YES
Constant	5.085***	0.437
	(0.904)	(0.384)
Observations	140,140	140,140
Wald chi-squared	38330	80197
F-test for excluded instruments	1515.91	2769.29
R^2 (within)	0.215	0.364

R² (between)	0.293	0.435
R² (overall)	0.253	0.381

Notes:

1. The dependent variables are "Concentrated religion market" and "Concentrated religion market * Ruler Different Religion," as stated in the first row.
2. Figures in parentheses are the standard errors.
3. * $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 5

State Secularism: Instrumental Variable Analysis

VARIABLES	(1)	(2)	(3)	(4)
Concentrated religion market	-0.225***	-0.213***	-0.230***	-0.220***
	(0.0422)	(0.0425)	(0.0423)	(0.0426)
Ruler different religion	-0.153***	-0.141***	-0.156***	-0.144***
	(0.0284)	(0.0284)	(0.0284)	(0.0285)
Concentrated religion market * Ruler different religion	0.542***	0.524***	0.547***	0.530***
	(0.0516)	(0.0516)	(0.0516)	(0.0517)
Historical state inertia	-0.897***	-0.894***	-0.898***	-0.895***
	(0.0131)	(0.0130)	(0.0131)	(0.0130)
Foreign ruler	-0.690***	-0.691***	-0.691***	-0.692***
	(0.0109)	(0.0110)	(0.0109)	(0.0110)
Historical state inertia * Foreign ruler	0.619***	0.619***	0.620***	0.621***
	(0.0133)	(0.0135)	(0.0134)	(0.0136)
Communist Regime	0.699***	0.683***	0.698***	0.683***
	(0.00903)	(0.00965)	(0.00903)	(0.00966)
Ottoman-controlled territory	-0.0958***	-0.0998***	-0.0958***	-0.1000***
	(0.00442)	(0.00433)	(0.00442)	(0.00434)
British-controlled territory	0.641***	0.649***	0.641***	0.648***
	(0.00933)	(0.00962)	(0.00934)	(0.00963)
French-controlled territory	0.625***	0.623***	0.626***	0.624***
	(0.00843)	(0.00841)	(0.00843)	(0.00842)
Spanish-controlled territory	-0.273***	-0.273***	-0.273***	-0.273***
	(0.00729)	(0.00731)	(0.00730)	(0.00732)
Portuguese-controlled territory	-0.304***	-0.302***	-0.305***	-0.303***
	(0.0101)	(0.0102)	(0.0101)	(0.0102)
Year (log)	0.187***	0.188***	0.186***	0.186***
	(0.0141)	(0.0145)	(0.0141)	(0.0146)
Geographic controls		YES		YES
Historical controls			YES	YES
Constant	-0.151	-0.264	0.122	-0.294
	(0.138)	(0.174)	(0.456)	(0.532)
Observations	142,311	139,308	142,311	139,308
Wald chi-squared	82523	82143	82433	82154
R^2 (within)	0.343	0.350	0.342	0.349
R^2 (between)	0.706	0.740	0.711	0.751
R^2 (overall)	0.515	0.537	0.518	0.541

Notes:

1. The dependent variable is presence of secular state (=1 if yes). The other endogenous variables are "Concentrated religion market" and "Concentrated religion market * Ruler different religion". The instrumental variables are "Distance to closest missionary religion," and its interactions with "Year (log)" and "Ruler different religion." See Table 4 for first-stage results.
2. Figures in parentheses are the standard errors.
3. * $p<0.1$; ** $p<0.05$; *** $p<0.01$

APPENDIX: Summary Statistics

VARIABLES		Mean	Std. Dev.
Secular state	overall	0.41	0.49
	between		0.34
	within		0.36
Concentrated religion market	overall	0.65	0.48
	between		0.33
	within		0.34
Ruler different religion	overall	0.24	0.43
	between		0.26
	within		0.34
Concentrated religion market * Ruler different religion	overall	0.09	0.29
	between		0.16
	within		0.24
Historical state inertia	overall	0.68	0.42
	between		0.40
	within		0.15
Foreign ruler	overall	0.39	0.49
	between		0.32
	within		0.37
Historical state inertia * Foreign ruler	overall	0.32	0.44
	between		0.33
	within		0.30
Communist Regime	overall	0.01	0.11
	between		0.02
	within		0.11
Ottoman-controlled territory	overall	0.08	0.26
	between		0.17
	within		0.20
British-controlled territory	overall	0.03	0.16
	between		0.05
	within		0.15
French-controlled territory	overall	0.01	0.12
	between		0.03
	within		0.11
Spanish-controlled territory	overall	0.04	0.20
	between		1.01E-01
	within		0.17
Portuguese-controlled territory	overall	0.01	0.12
	between		0.06
	within		0.10
Year (log)	overall	7.29	0.20
	between		8.91E-16
	within		1.98E-01
Log [Neolithic transition timing (ancestry adjusted)]	overall	8.49	0.45

	between		0.45
	within		0
Settlement duration	overall	6.24	4.86
	between		4.88
	within		2.41E-14
Total land area (10000 sqm)	overall	89.49	209.24
	between		209.97
	within		0
Land suitability for agriculture	overall	0.38	0.24
	between		0.24
	within		0
Mean elevation	overall	0.58	0.50
	between		0.50
	within		0
Temperature	overall	17.65	8.40
	between		8.43
	within		0
Precipitation	overall	86.88	58.52
	between		58.72
	within		0
Migratory distance from East Africa	overall	8.11	6.74
	between		6.76
	within		0
Terrain roughness	overall	0.18	0.14
	between		0.14
	within		0
Dummy for landlocked countries	overall	0.26	0.44
	between		0.44
	within		0
Distance to closest missionary religion (1000 m)	overall	2.14	1.97
	between		1.98
	within		0
Distance to closest missionary religion * Year(log)	overall	15.60	14.37
	between		14.41
	within		0.58
Distance to closest missionary religion * Ruler different religion	overall	0.38	0.94
	between		0.53
	within		0.78
Distance to closest missionary religion * Year(log) * Ruler different religion	overall	2.82	6.96
	between		3.90
	within		5.78
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