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Robert J. Barro
Rachel M. McCleary

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ABSTRACT

For 188 independent countries in 2000, 72 had no state religion in the years 2000, 1970, and 1900; 58 had a state religion at all three dates; and 58 had some kind of transition. Among the 58 transitional countries, 12 had two transitions, 4 of which (former Soviet Republics in Asia) involved two forms of state religion. The probability of having a state religion in 2000 or 1970 depends strongly on the status of state religion in 1900 but much more so for countries that experienced no major change in political regime during the 20th century. Communist governments tend not to have state religion – only one Communist country (Somalia in 1970) had a state religion in the usual sense. However, a past history of Communism does not have much influence on the probability of state religion. Greater concentration of religious adherence is positively related to state religion, and most of this relation seems to reflect causation from religious concentration to state religion, rather than the reverse. Theoretically, state religion is more probable when the population adheres to a monotheistic religion. We find this effect for Muslim adherence, but the relationship is not robust. State religion is less likely in sub-Saharan Africa, possibly because of the intense competition for converts in this region among the major world religions. The probability of state religion does not differ significantly between former colonies and non-colonies but is higher for British colonies than for Spanish and Portuguese colonies. Variables that have little effect on the probability of state religion include per capita GDP, country size, and the extent of democracy, civil liberties, and the rule of law.

Robert J. Barro
Department of Economics
Harvard University
Cambridge, MA 02138
and NBER
rbarro@harvard.edu

Rachel M. McCleary
Weatherhead Center
Harvard University
Cambridge, MA 02138
mccleary@wcfia.harvard.edu

State religion plays a central role in Adam Smith's vision of the religion market (Smith [1791, Book V, Article III]). According to Smith, the key aspect of state religion is its promotion of the monopoly position of the favored religion. This promotion works partly through limitations on entry of competitors and partly through subsidies. Smith's analysis focuses on the adverse consequences from the monopoly positions of the Anglican Church in England and the Catholic Church in other countries. He argues that monopoly providers of religious services tend—as monopolies do generally—to become non-innovative and indolent. Consequently, service quality and religious participation decline. This argument has been broadened in modern analyses of the "religion-market model" by Stark and Bainbridge (1987), Finke and Stark (1992), Iannaccone (1991), and Finke and Iannaccone (1993).

Our previous research (McCleary and Barro [2003]) investigated the effects of state religion on religiosity. We found from country averages of survey data for the 1980s and 1990s that the presence of state religion raised religious participation and beliefs. Our interpretation was that the subsidy element in state religion—which typically encourages investment in organized religion—dominated over the monopoly element—which curtails competition and, thereby, reduces religious participation. These relationships applied when we held fixed a measure of government regulation of the religion market and an index of religious pluralism. Consistent with the religion-market model, we found that religious participation and beliefs fell with regulation (in the sense that the government appointed or approved religious leaders) and with a decrease in religious pluralism.

In another paper (Barro and McCleary [2003]), we used our findings about the determinants of religiosity to estimate the effects of church attendance and religious beliefs on economic growth in a panel of countries from 1965 to 1995. Our estimation procedure isolated causation from religiosity to economic performance, rather than the reverse, by using instrumental variables for religiosity. The instruments were dummy variables for the presence of state religion and state regulation of religion and measures of the composition of religious adherence. This analysis assumed that the presence or absence of a state religion was exogenous with respect to economic growth. Hence, we neglected the possibility—emphasized by secularization theorists—that increasing incomes would induce countries to drop state religions.[1]

In the present study, we try to explain the choice of state religions. This choice is a political calculus that involves interactions between the government and the religion sector. Thus, we can analyze establishment as a political-institutional decision that involves benefits and costs from the promotion of a monopoly religion.

The benefits from state religion include gains from monopoly power for the dominant religion provider. Benefits to the state may involve control over the religion sector. For example, in Communist countries and some other dictatorships, avoidance of state religion is part of a policy to weaken the power of organized groups that would otherwise compete with the state. However, in theocracies such as present day Iran, the maintenance of an official state religion becomes part of the government's plan for controlling society.

[1] This idea appears in Weber (1930) and has been extended in Wilson (1966), Berger (1967), and Chaves (1994).

The costs from state religion include losses for excluded providers and to individuals who are taxed or whose choices are constrained. However, as in Olson's (1965) analysis, free-rider problems involved in organizing collective action may mean that the costs to individuals are not effectively transmitted through the political process as constraints on government policy.

Gill (2002) has argued that studies of religious liberty should take the form of positive analyses of why the government regulates religious organizations in a particular way. Our approach to the existence of state religion accords in spirit with the one proposed by Gill.

We want to understand the determinants of state religion for two reasons. First, we found before that the presence of a state religion has important consequences for the workings of the religion market and, hence, for the extent of religious participation and beliefs. These relationships matter, in turn, for economic growth. That is, by influencing religious participation and beliefs, the establishment of a state religion ultimately has consequences for economic growth and probably for other economic, political, and social variables. Given these effects from state religion, it is useful to isolate the underlying factors that influence the establishment decision.

Second, more narrowly, our investigation of economic growth hinged on the treatment of the state-religion variable as exogenous with respect to per capita GDP. Our analysis of the determinants of state religion will help to ascertain whether this treatment was satisfactory. It may turn out—as we believe it does—that the presence of state religion is nearly exogenous with respect to the dependent variable that we focused on—economic growth—so that our analysis of the effects of religiosity on growth was

satisfactory. Nevertheless, the presence of a state religion is endogenous in a fuller sense that includes variables other than per capita GDP. We isolate some of these variables in the present study.

Previous research has sought to explain other forms of political choices and institutions across societies. For example, a research program initiated by Aristotle (1932) and taken up by Lipset (1959), Barro (1999), and Przeworski, et al (2000) analyzes why some countries are democratic and others are not. Empirical analyses have stressed the effects of economic development on political and legal structure, including the extent of electoral rights, civil liberties, rule of law, and official corruption. This research program relates to modernization theory, whereby economic development is posited to lead to an array of changes in social and political institutions. This theory, discussed in Bell (1973) and Inglehart and Baker (2000), is reminiscent of the economic determinism of Marx (1913, pp. 11-12). Modernization theory has sometimes been applied to state religion, notably in the secularization view that economic development makes state religion less likely. However, our study does not find an important influence of economic development on the propensity to have state religion.

I. Historical Context

Many state religions go back hundreds of years and were introduced for reasons that are likely to be independent of forces that operated in the 20th century. For example, we will not attempt to explain the Protestant Reformation initiated by Luther and Calvin in the early 1500s, but this event continues to be important in the Christian world. One well-known sidelight of the Reformation was Henry VIII's ouster of the Roman Catholic

Church in 1534, purportedly over the Pope's refusal to grant permission for a divorce. The divorce issue was only one of many conflicts between Henry VIII and Rome, and the confiscation of church property was probably a more significant motivation for the change of official religion. However, our main point is that, for purposes of 20th century analysis, we can reasonably take as given the establishment of the Anglican Church in England in 1536-40. Moreover, this exogenous event seems to have a lot to do with the continuing presence of the Anglican state religion in England.

Although Henry's actions are familiar, less well known is the ouster of the Roman Catholic Church in Sweden by King Gustaf Vasa in 1527. The establishment of the Lutheran church seemed motivated primarily by the desire to confiscate the Catholic Church's wealth, following a period of expensive and bloody warfare through 1520, after which Sweden separated from Denmark. The continuing presence of the Lutheran state church in Sweden and the rest of Scandinavia likely stems from these long ago events at the time of the Reformation. (Sweden abandoned its official state religion only in 2000, but Lutheranism remains the state religion in the other Scandinavian countries.)

Our analysis does not attempt to explain Henry VIII's actions in 1534 or Gustaf Vasa's in 1527. Going back further, we also do not explain why the Orthodox Church separated from the Roman Catholic Church in the Great Schism of 1054, why Catholicism and Islam became the state religions of many countries much earlier, or why Buddhism arose out of Hinduism in India some 500 years before Christ and gradually became prominent in parts of East Asia. Operationally, we take as given the status of state religion in a region at some point in the past and, for us, the relevant date is a

relatively recent one, 1900. This year is the earliest time at which we have a broad classification of countries in terms of state religions.

The starting date of 1900 means that we do not analyze relatively recent events from the 1500s through the 1800s. For example, we do not explain the counter-Reformation, which led to more religious tolerance with the Peace of Augsburg in 1555 and its eventual confirmation and extension in the Treaty of Westphalia in 1648. The Peace of Augsburg granted tolerance to Lutherans in the Hapsburg Empire. The Treaty of Westphalia extended this tolerance to the Reformed (Calvinist) Church. Thus, by 1648, tolerance applied to the three great religious communities of the Empire—Roman Catholicism, Lutheranism, and Calvinism. With the Peace of Westphalia, the member states agreed to respect private worship, liberty of conscience, and rights of migration for religious minorities and dissidents within their domains.

Other events that we do not explain include the establishment of Catholicism in the Spanish and Portuguese colonies in Latin America and of forms of Protestantism in most of the colonies of what was to become the United States.[2] In our main analysis, this variety of historical experience shows up as initial conditions in 1900. Our focus is on how state religion evolved over the next 100 years—specifically, we concentrate on data on the presence of state religion in 1970 and 2000.

In this study, we categorize official state religion as an all-or-nothing choice. However, the official state church in some countries—say England or Scandinavia—

[2] The Anglican Church was the official religion of the largest number of colonies, notably in the South. However, the Congregationalist Church (related to Presbyterianism) dominated in New England, except for Rhode Island, which lacked an official religion. The Congregationalist Church was not disestablished until 1818 in Connecticut, 1819 in New Hampshire, and in two parts—in 1824 and 1833—in Massachusetts. The prohibition against establishment of an official religion, a part of the Bill of Rights, was not applied to state governments until the extension of the equal-protection clause of the 14th Amendment to state governments starting in the late 1800s. This extension culminated in a Supreme Court decision in 1934. For discussions, see Norman (1968, chs. 1 and 2), Finke and Stark (1992, ch. 3), and Olds (1994).

represents less of a restriction on religious expression than in other countries—say Iran. We could extend our analysis to consider the relation between government and religion as a continuum, and we could examine a variety of forms of interaction between government and religion. In an ongoing project, Fox and Sandler (2004) are assembling a Religion and State data base. They classify the relation between religion and state in numerous categories, which are arranged into four broad groupings: separation of religion and state, discrimination against minority religions, restrictions on majority religions, and religious legislation. Although each individual measure is a (0,1) dummy variable, indexes based on the large number of individual components would be nearly continuous. The Fox-Sandler data will eventually be available for most countries back to 1960 but are presently available only since 1990. We plan to use their data eventually to investigate more aspects of the interaction between government and religion.

Our study covers 188 countries that were independent in 2000.[3] The 188 represent the countries for which we have data on state religion and other relevant variables. Among these 188, 40%—75 countries—are classified as having state religions in 2000. Going back in time, 39% of 189 countries—73—had state religions in 1970, and 59% of 188—111—had state religions in 1900.[4] Thus, the crude data for the 20th century indicate a downward trend in state religion in the first part of the century but no trend over the last 30 years.

[3] The criterion of legal independence in 2000 excludes, for example, Bermuda, Hong Kong, and Macao.
[4] The 189 countries in 1970 include East and West Germany as separate entities. Many of the 188 independent countries that existed in 2000 were not independent in 1970 and, even more so, in 1900. For countries that were not independent in 1970 or 1900, the designation of state religion pertains to the regime applying to the comparable region. Some of these regions were colonies—for example, in Africa—and others were parts of larger countries—for example, republics of the Soviet Union or Yugoslavia in 1970 or pieces of the Ottoman Empire in 1900.

Our classifications of state religion come primarily from Barrett (1982, pp. 800-801) and Barrett, Kurian, and Johnson (2001, pp. 834-835).[5] These sources have the advantage of providing global coverage over time on a reasonably consistent basis. Although the designations are influenced by a country's legal provisions, including statements about religion in constitutions, the concept employed is ultimately *de facto*. The classifications are clearer in some cases than others. In some of the straightforward situations, the constitution designates an official state church and restricts or prohibits other forms of religion. However, even without these designations or prohibitions, the government may systematically favor a specified religion through subsidies and tax collections or through the teaching of religion in public schools. These considerations caused Barrett, et al to classify some countries as having a "state religion," despite the absence of an official state church in the constitution. Controversial cases of this type in 2000 include Italy, Portugal, and Spain, which Barrett, et al deem to have a Catholic state religion. We consider later whether our results are sensitive to changes in designations for these cases.

Barrett (1982) and Barrett, Kurian, and Johnson (2001) classify some governments as favoring multiple religions or religion in general, although not maintaining a single religion. Examples in 2000 are Australia, Belgium, Brazil, Cyprus, Philippines, South Africa, and Switzerland. These countries lack a state religion in the

[5] We corrected a number of typos in the designations in Barrett, Kurian, and Johnson (2001). We also updated for two recent events: Sweden dropping Lutheranism as the state religion in 2000 and Bulgaria adopting Orthodoxy as the state religion in 2001. Finally, in accordance with the U.S. State Department *Survey of Religious Freedom* and other sources, we classified Cambodia as having a state religion (Buddhist) in 2000. The discussion in Barrett, Kurian, and Johnson (2001, p. 165) reveals that events after 1975 in Cambodia were not taken into account, including the reestablishment of a Buddhist state religion in 1989.

sense of having or favoring a monopoly religion. Therefore, we classified these countries as not having a state religion.[6]

Tables 1a-1g describe the data on state religion. The tables are organized to facilitate thinking about changes in the status of state religion since 1900. In terms of transitions, the 188 countries in 2000 break down into seven types. Table 1a shows the 72 countries that maintained no form of state religion throughout, that is, in 1900, 1970, and 2000. Examples are Australia, Canada, France, Germany, Mexico, and the United States.[7]

Table 1b shows the 58 countries that had a state religion at all three dates: 1900, 1970, and 2000.[8] (Each of these countries maintained only one type of state religion at the three dates.) Among these, 21 had Catholic state religions, 22 had Muslim, 9 had Protestant (where we include Anglican with Protestant), 1 had Orthodox, 4 had Buddhist, and 1 had Hindu.

The remaining 58 countries had some kind of transition between the presence and absence of state religion from 1900 to 2000. (Among these, 12 countries had two transitions.) Table 1c shows the 29 countries with state religions in 1900 that abandoned state religion by 1970 and did not reinstitute state religion by 2000. Examples are Brazil and Chile (which dropped the Catholic state church), Turkey (Muslim), Indonesia (which dropped the Dutch Reformed Church that had been imposed by the former colonial ruler),

[6] In 1993, the new Guatemalan constitution recognized indigenous and Protestant religions, in addition to the Catholic religion. However, we followed Barrett, et al (2001) in labeling Guatemala as having a state religion (Catholic) in 2000.

[7] The French republic separated completely from the Catholic Church in 1905. However, under the Third Republic, which started in 1871, there was a gradual movement toward universal and secular education. Probably for this reason, Barrett, et al label France as not officially Catholic in 1900.

[8] We have not investigated in detail whether lapses in state religion occurred in these countries at other dates in the 20th century. Two cases that we know of are Afghanistan lacking a state religion from the time of the Marxist coup in 1978 until the rise of the Taliban in the mid 1990s and Cambodia lacking a state religion from the rise of Communism in the mid 1970s until 1989.

Russia (Orthodox), Japan (Shinto, a form of Buddhism), and China and Korea (Confucianism). Table 1d shows the 12 countries with state religion in 1900 that abandoned state religion between 1970 and 2000. This group includes Ireland (which dropped Catholic[9]), Syria (Muslim), and Sweden (Protestant).

Table 1e shows 12 countries that had a state religion in 1900, dropped the state religion by 1970, but then reinstated a state religion by 2000. These cases are all former republics of the Soviet Union or Yugoslavia. Four Asian countries that were previously parts of the Soviet Union had Orthodox state religions in 1900 (as parts of the Russian empire) but adopted Muslim state religions by 2000. Five other former Soviet republics, including Armenia and Ukraine, reinstated an Orthodox state religion by 2000. Croatia is designated as having a Catholic state religion in 1900 and 2000 but no state religion, as part of Yugoslavia, in 1970.

Finally, Tables 1f and 1g show countries that had no state religion in 1900 but introduced one by 1970 (3 cases) or 2000 (2 cases). The three countries that adopted by 1970 were not independent entities in 1900: Bangladesh[10] and Pakistan, which instituted a Muslim state religion, and Israel, which adopted a Jewish state religion. The two countries that adopted between 1970 and 2000 are Vanuatu, which introduced a Protestant state religion upon independence in 1979, and Bulgaria, which established the Orthodox Church (in 2001, rather than 2000).[11]

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[9] Our classification follows Barrett, et al's designation of Ireland as having a Catholic state church in 1900 and 1970. However, the official status of the Catholic Church in Ireland, such as it was, was not established until after Irish independence in 1921. Moreover, the Anglican Church was disestablished in Ireland in 1869. Therefore, it might be preferable to treat Ireland as lacking a state religion in 1900 and having one in 1970. A 1972 referendum eliminated the Catholic Church's official status.

[10] Bangladesh lacked a state religion from the time of its independence from Pakistan in 1972 until the military coup of 1975.

[11] Barrett, et al classify Bulgaria as not having an Orthodox state religion in 1900, when the country was subject to competing influences from the Russian and Ottoman empires. If Bulgaria were classified instead

II. Conceptual Issues

The decision to implement or maintain a state religion involves interactions between the government and the religion sector. Part of this interaction involves the degree of separation between church and state—in some countries with state religions, church and state are inseparable.

Our general perspective is that a state religion is more likely to exist when the net benefits to the state and the potential monopoly religion are greater. We describe in subsequent paragraphs a number of factors that influence this net benefit. However, given these factors, we assume that the mere existence of a state religion makes it more likely that the state religion will continue into the future. In this sense, state religion is like other political and legal institutions. Changing any of these institutions requires the reaching of a political consensus or the application of a strong force from the central political authority. Typically, the maintenance of the status quo is the option of lowest cost and, hence, highest net benefit. In our context, we find that this force remains important over a 100-year horizon.

Although institutional changes are costly, a change in any one feature—such as the implementation or removal of a state religion—is easier when other regime changes are already taking place. For example, for a former colony, independence entails the creation of a new form of government, which typically involves the enactment of a constitution and other aspects of a legal system. At such times, changes in the status of state religion are also likely to occur. Similarly, when a large country breaks apart—such

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as having a state religion (Orthodox) in 1900, the country would fall into Table 1e—in this case, an eastern European country that dropped a state religion under Soviet influence and then reintroduced it when the Soviet Union collapsed.

as the disintegrations of the Ottoman Empire, the Soviet Union, and Yugoslavia—the newly independent states can readily change the legal treatment of religion.

To capture this force, we classified countries in 1970 and 2000 as to whether they had experienced at least one major regime change since 1900. The question of what constitutes a major regime change is subjective. However, to enhance our objectivity, we labeled as a major regime change only an occurrence of one of the following three events: a transition from colonial status to independence, a split-off of part of a larger country into a separate state, and the adoption or elimination of Communism. Based on these criteria, our classification for 1970 has 113 of 189 countries or 60% with at least one major regime change since 1900. In 2000, 136 of 188 countries or 72% had experienced such a change. Most of our classifications of major regime changes are straightforward but some are not. For example, we do not label as major regime changes war-related occupations of countries and the associated post-war shifts in governing institutions. Debatable classifications of this type include Japan, South Korea, and Turkey, each of which we classify as having no major regime change since 1900. We explore later how our results change if we shift the classifications for these cases.

One important influence on the net benefit from state religion is the degree of homogeneity of the population with respect to religious adherence. Gill (2002) argues that, in a pluralistic setting, all religion providers will favor a framework that allows for free entry into the religion market. We measure homogeneity of religious adherence by standard measures of concentration—Herfindahl indexes for adherence shares in 1900, 1970, and 2000. These indexes—the sum of the squares of the population shares among 11 groups—can be interpreted as the probability that two randomly selected persons

belong to the same religion.[12] The maintenance of religious monopoly—notably the deterrence of entry by outside groups—is less costly when more of the population adheres to the monopoly faith. More generally, homogeneity of the population with respect to other characteristics, such as ethnicity and language, might help to install a monopoly religion.

An important issue for the empirical analysis is that state religion and the structure of religious adherence may have a two-way interaction. More homogeneity promotes state religion, but state religion likely promotes concentration of religious adherence in the monopoly faith. As an attempt to sort out these interactions, we use variables from 1900 as instruments for the concentration of religion in 1970 and 2000.

Governments may use the absence or presence of state religion as a way to control the religion sector. Important examples are Communist governments, some of which promoted "scientific atheism" as an alternative to usual forms of organized religion.[13] The anti-religious nature of Communist regimes is so powerful that our sample has only one example of a Communist government that maintained a state religion—Somalia with a Muslim state religion in 1970.[14] Our analysis treats the presence of a Communist

[12] The data on religious adherence are from Barrett (1982) and Barrett, Kurian, and Johnson (2001). We use the breakdown: Catholic, Protestant, Orthodox, other Christian, Muslim, Hindu, Buddhist, other Eastern religions, Jewish, other religions, and non-religious. The last category includes atheists and persons professing no religion. This classification differs from the one used in our prior work by the inclusion of the non-religion group and by the addition of the category for other Christians (which includes adherents to independent Christian churches, marginal Christians, such as Mormons and Jehovah's Witnesses, and unaffiliated Christians). Barrett, et al do not provide a breakdown of Muslim or Buddhist adherence by type.

[13] For a discussion of the promotion of atheism under Communism, especially in East Germany, see Froese and Pfaff (2003).

[14] In 2000, we classed 5 of the 188 countries as having Communist regimes, based on the descriptions of governmental systems in *CIA World Fact Book*. The five are China, Cuba, Laos, North Korea, and Vietnam. (North Korea is actually classed as "authoritarian socialist, one-man dictatorship.") In 1970, we used Kornai's list (1992, Table 1.1) to classify 35 of 189 countries (separating Germany into East and West) as having Communist governments. Many of the Communist "countries" in 1970 were parts of larger states (republics of the Soviet Union and Yugoslavia) or were Eastern European countries that were

government as exogenous to the religion market—that is, we view the relation between Communism and state religion as causation from the former to the latter. In addition to examining the contemporaneous effect, we investigate whether Communist governments have a lasting influence that persists after the Communist regime has ended.

Some religions may have more to gain than others from the imposition of a state religion. Notably, a religion that regards its own faith as essential for salvation is more likely to press for a state religion as a way to suppress "inappropriate" worship by other religions. Stark (2001, 2003) argues that this outlook on salvation applies especially to the three great monotheistic religions—Judaism, Christianity, and Islam: "Those who believe there is only One True God are offended by worship directed toward other Gods." (Stark [2003, p. 32]). He argues accordingly that these monotheisms have the most to gain by allying with the state to secure a religious monopoly. In our empirical analysis of state religion in 1970 and 2000, we find some evidence for a positive effect from Muslim adherence. Catholic and Protestant religions may have had similar influences at earlier times, but these effects do not show up in the data for the 20th century.

In 1900, much of sub-Saharan Africa represented reasonably open territory in which the major world religions could compete for influence. For unweighted averages of 48 sub-Saharan African countries that existed in 2000, the fraction of the adhering population professing the Catholic religion rose from 0.06 in 1900 to 0.23 in 2000, the fraction Protestant or other Christian rose from 0.03 to 0.26, the fraction Muslim

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heavily influenced by the Soviet Union. Also classed as Communist were China, Congo (Brazzaville), Cuba, Mongolia, North Korea, North Vietnam, and Somalia. Since our data for Vietnam are not separated into North and South, we entered the Communism dummy for Vietnam in 1970 as one-half, corresponding to the roughly equal breakdown of the population between North and South. South Yemen was also Communist in 1970, but our data for 1970 refer only to non-Communist North Yemen (roughly 80% of the combined population of Yemen). Our data for Communism in 1955 also come from Kornai's list, and our data for Communism in 1985 come from *CIA World Fact Book* and individual country sources.

increased from 0.20 to 0.30, and the fraction associated with indigenous and other religions fell from 0.69 to 0.16.[15] Thus, especially for the Christian religions, the main religious conversions in Africa occurred in the 20th century. This potential for conversion should have created opportunities for establishments of state religions. However, in contrast with the Americas in the 1500s and 1600s, the strong competition among the major world faiths in sub-Saharan Africa may have impeded the implementation of legally supported monopoly religions. Our analysis would pick up this effect from the inclusion of a measure of religious concentration. However, a separate dummy variable for sub-Saharan Africa turns out also to have a negative influence on the likelihood of state religion.

An important issue for evaluating our previous analysis of economic growth is whether the level of economic development, represented by per capita real GDP, influences the probability of having a state religion. The secularization hypothesis posits that an increase in per capita GDP lowers the demand for organized religion. If this hypothesis is correct, then an increase in per capita GDP likely lowers the net benefits to a potential monopoly religion from having a state religion. Therefore, this view predicts that an increase in per capita GDP would lower the probability of having a state religion. We find little support for this hypothesis.

A country's prior colonial status may matter for state religion. Woodberry (2003) argues that missionaries were especially important in influencing educational systems and, thereby, affecting future political systems, including the extent of democracy. Along similar lines, we might predict that former colonies of Britain would be likely to have a

[15] These numbers do not include the fraction Orthodox, which rose from 0.01 in 1900 to 0.02 in 2000. The data on religious adherence shares are discussed in n.12.

Protestant state religion, whereas former colonies of France, Spain, and Portugal would be likely to have a Catholic state religion. Our empirical findings show no overall difference between colonies and non-colonies in the propensity to have a state religion. However, British colonies are more likely than Spanish or Portuguese countries to have a state religion.

La Porta, et al (1988) argue that continuing effects from former colonial rulers often work through legal systems—for example, former British colonies having common-law systems and former colonies of France, Spain, and Portugal having statute-law systems. Categorizations of countries by former colonial status are similar to but not identical to classifications by legal systems. For example, Thailand and Bhutan are classified as non-colonies but have British style common-law systems; Iran is classed as a non-colony but has a French style statute-law regime; and Egypt, Iraq, Malta, and Mauritius are classified as former British colonies but have French style statute-law systems. We lack a theoretical argument for why common-law versus statute-law arrangements would relate to the choice of state religion, and the empirical results do not show an effect that can be distinguished from colonial history more generally.

The choice of a state religion can be viewed as one form of limitation on individual freedom. From this perspective, we might expect the presence of state religion to relate to other dimensions of democracy and legal structure. On the other hand, a casual view of the data indicates that weakening or elimination of state religion is sometimes a part of broad liberal reform but at other times is the work of a dictator (notably in Communist governments). Consistent with these opposing forces, our

empirical analysis does not show a clear relation of state religion to indicators of democracy, civil liberties, and the rule of law.

We can also think of state religion as a particular form of market regulation. Mulligan and Shleifer (2004) model the choice of regulation in a political-economy setting. Given fixed costs of regulating, they argue that larger jurisdictions tend to have more regulation. An extrapolation of the Mulligan-Shleifer idea to our setting would predict that larger countries would be more likely to have state religions. We find no supporting evidence for this hypothesis.

III. Empirical Findings

Our empirical analysis focuses on linear probability models for the presence of state religion. The obvious problem with these linear specifications is that the fitted values for explaining state religion need not lie in the interval (0, 1), as would be true for a probability. This problem can be handled by a binary-model specification, such as the probit form that we consider later. The results from probit estimation are similar to those for the linear model. Since the linear models are more tractable, especially for imposing theory-based restrictions on coefficients and for assessing causation, we focus on these results.

A. Estimates of Linear Probability Models with no Allowance for Endogeneity

Table 2 shows the means and standard deviations of the variables used in the analysis. Table 3 has estimates of the linear probability models. The first set of results

neglects the potential endogeneity of some of the right-hand side variables. These results are labeled as SUR (for seemingly-unrelated regression model) in the table. Another set of results takes account of possible endogeneity of some of the right-hand side variables. These results are labeled as 3SLS (for three-stage least-squares). We consider the 3SLS results in the next section.

The dependent variable is a (0, 1) dummy for the presence of a state religion in 2000 or 1970. Thus, we investigate only whether a state religion exists, not the particular form of state religion. The reasoning for the inclusion of the various explanatory variables has already been presented. Column 1 of Table 3 includes a dummy variable for the presence of state religion in 1900, the Herfindahl index for concentration of religion in 2000 or 1970, the presence of a Communist regime (for 2000 and 1985 in the 2000 equation, for 1970 and 1955 in the 1970 equation), the fraction of the population that is Muslim in 2000 or 1970, and a dummy variable for sub-Saharan Africa.

We use a specification that allows for persistence of state religion over time but that distinguishes countries with at least one major regime change from those without such a change. Let S_t be a zero-one dummy variable for the presence of state religion for a country in year t. Let R_t be a (0, 1) dummy variable for whether the country has experienced at least one major regime change since 1900. The specification of the deterministic part of our linear probability model is then

$$(1) \qquad S_t = S_{1900}\cdot[\lambda_1\cdot(1-R_t) + \lambda_2\cdot R_t] + [1 - \lambda_1\cdot(1-R_t) - \lambda_2\cdot R_t]\cdot\beta Z_t + \text{constant},$$

where S_{1900} is a dummy variable for the presence of state religion in 1900, the coefficients λ_1 and λ_2 ($0<\lambda_1<1$ and $0<\lambda_2<1$) determine the persistence over time in the probability of state religion for countries without and with regime changes, respectively

($R_t = 0$ or $R_t = 1$), and βZ_t represents the long-run influence of a set of explanatory variables, Z_t, on the probability of state religion. The vector Z_t includes the concentration index for religious adherence in year t, the presence of Communism in year t and in the past, and so on.

The coefficients λ_1 and λ_2 would differ depending on whether S_t is observed in 2000 or 1970. Since 100 years have elapsed since 1900 in 2000 and only 70 years in 1970, we anticipate that λ_1 and λ_2 would each be higher in 1970 than in 2000. That is, more of the persisting influence from the status of state religion in 1900 would remain in 1970. In any event, we estimate one pair of coefficients, (λ_1, λ_2), for 2000 and another pair for 1970.

The other coefficients, given by β in equation (1), represent the long-run effects of the variables Z_t on the probability of state religion. Hence, the coefficients β should be the same in the equations for 2000 and 1970. We therefore carry out the estimation under the restriction that these coefficients are the same for the two years. The imposition of these restrictions sharpens the precision of our estimates. We can also test the hypothesis of equality for the coefficients β in 2000 and 1970. These tests reveal that the data accord with the hypothesis of equality.

Consider first the results in Table 3, column 1. This SUR estimation treats the equations for state religion in 2000 and 1970 as a system, where the error terms for each country are allowed to be correlated over time. However, as mentioned, this method makes no allowance for endogeneity of any of the right-hand-side variables. (The method also weighs countries the same, independently of size, geographical proximity to other countries, and so on.)

Given the other explanatory variables, the existence of a state religion in 1900 matters a great deal for the probability of state religion in 2000 and 1970. For a country that has experienced no major regime change since 1900, the estimated coefficients are 0.75 for 2000 and 0.91 for 1970. These coefficients are each statistically significantly different from zero with p-values less than 0.01.[16] The coefficient in the 1970 equation is higher than that for 2000 with a p-value for the difference of 0.025.[17] This result makes sense because it signifies that less of the effect from the initial condition in 1900 would have decayed by 1970 than by 2000.

For a country with at least one major regime change, the coefficients on the dummy variable for state religion in 1900 are 0.31 for 2000 and 0.28 for 1970. These coefficients are statistically significantly different from zero with p-values less than 0.01.[18] Each coefficient is significantly lower, with p-values less than 0.01, than its counterpart for countries with no major regime change (point estimates of 0.75 and 0.91, respectively). That is, as expected, the status of state religion in 1900 is substantially more important for countries with no major regime change than for those with such a change. Among countries with regime changes, we would have expected a smaller coefficient for 2000, but the two coefficients (0.31 and 0.28) do not differ statistically from each other. This outcome may signify that, for countries with regime changes, the most important influence on the probability of state religion is the fact of such a change (interacted with the other explanatory variables), rather than the time elapsed since 1900.

[16] Using a one-sided Wald test, each coefficient is also significantly less than one (p-value of 0.002 for 2000 and 0.043 for 1970). However, it may be more appropriate to test for unit coefficients by using some variant of a unit-root test.
[17] This result applies for a Wald test of equal coefficients against the alternative hypothesis that the coefficient for 1970 is larger than that for 2000 (that is, a one-sided test).
[18] These coefficients are also significantly less than one.

For countries with no major regime change, we can view the estimated coefficients on the 1900 value for the state-religion dummy variable as gauging the rate at which the historical presence of state religion becomes unimportant for the current environment. The values of 0.906 for 1970 and 0.748 for 2000 (column 1 of Table 3) imply decay rates of 0.14% and 0.29% per year, respectively.

The results can be extrapolated to the very long-term evolution of state religion. If we assume a decay rate of 0.2% per year, the probability of observing state religion in 2000 would depend on the presence of state religion at the time of the Reformation—say, 470 years earlier—with a coefficient of 0.39. Thus, the establishments around 1530 of the Lutheran Church in Scandinavia and the Anglican Church in England would still matter substantially for the likely character of current state religion. An even earlier event—the Great Schism between the western (Rome) and eastern (Constantinople) branches of the Catholic Church in 1054— would matter in 2000 with a coefficient of 0.15.

One important caveat for these calculations is that the changes during the Reformation and the Great Schism refer to shifts in the forms of state religion, rather than movements from state religion to no state religion. It may be that the probability of eliminating state religion entirely was close to zero for a long time in the years before the 20th century. Another point is that the calculations apply only to countries that do not experience major regime changes. If changes occur to the basic form of government (which could itself be modeled probabilistically), the influence from the presence of state religion in the long ago past would be negligible.

As mentioned, we can think of the coefficients on the other explanatory variables in column 1 of Table 3 as representing effects on the long-run probability of a state religion in a country, independent of the situation in 1900. Religion concentration, gauged by the Herfindahl index, has a statistically significant, positive coefficient.[19] The point estimate of 0.71 means that a one-standard-deviation increase in concentration (by 0.23 in 2000, see Table 2) raises the probability of state religion by 0.16. This interpretation assumes that the estimated coefficient reveals the influence from religion concentration to the probability of state religion. In the three-stage least-squares systems, we allow for reverse causation from state religion to religion concentration.

The contemporaneous presence of a Communist government has a statistically significant, negative effect on the probability of a state religion. The presence of Communism is estimated to reduce the probability of state religion by 0.49. We should note that, in 2000, our sample has 5 of the 188 countries designated as Communist and, in 1970, 34 of the 189 countries, plus one-half of Vietnam, classified as Communist. The only one of these countries that had a state religion contemporaneously with Communism was Somalia in 1970.[20]

We also estimated lagged effects of Communism by entering a dummy variable for Communism in 1985 in the 2000 equation and for 1955 in the 1970 equation.[21] The

[19] We also added measures of concentration of the population by ethnicity and language, as constructed by Alesina, et al (2003), to the specification in Table 3, column 1. The ethnicity variable has a coefficient that is negative (the wrong sign) and marginally significant: -0.30 (s.e. = 0.15). The language variable (added separately from ethnicity) is not statistically significant; the coefficient is -0.02 (0.14). In each case, the coefficient on religion concentration remains positive and statistically significant.

[20] The autocrat Siad Barre, who came to power in 1969, argued that his brand of socialism was consistent with Islam. Thus, initially, there were no changes in the official status of Islam. However, in the pursuit of "scientific socialism" in the 1970s, Siad Barre moved increasingly to weaken the political influence of religious leaders.

[21] In this analysis, the 1985 value of the Communism dummy for unified Germany is set to 0.20, the population share of the eastern parts.

results in column 1 indicate a significantly negative effect, -0.17, from the presence of Communism 15 years earlier. However, the significance of this coefficient is not robust to changes in specification that we consider later. The principal finding is that the presence of Communism sharply lowers the contemporaneous probability of state religion but has relatively little influence once Communism is eliminated. The main changes over time in the Communism variable come from the 28 countries in 2000 that were no longer Communist because of the collapses in the 1990s of the Soviet Union and Yugoslavia. Thus, our results imply that the history of Communism in these places did not have much lasting influence on the probability of state religion.

The Muslim religion adherence share has a coefficient, 0.37, that is positive and statistically significant at the 0.05 level.[22] However, as with lagged Communism, the significance of this coefficient turns out not to be robust to changes in specification that we consider later. If we add the Catholic religion share, the coefficient of this variable is statistically insignificant from zero. If we go further to include the shares for the other main monotheistic faiths—Protestant, Orthodox, and Jewish—the only statistically significant coefficient is a positive and marginally significant one for the Jewish share. This result is driven by the presence of a state religion in Israel.

The dummy variable for sub-Saharan Africa has a coefficient, -0.48, that is negative and statistically significant. Thus, even after holding constant the measure of religion concentration, presence in sub-Saharan Africa is associated with a lower probability of state religion. One possible reason for the significance of the Africa dummy is that the data on religious adherence, which underlie the construction of the

[22] Fox and Sandler (2004, p. 12) observe from simple correlations that predominantly Muslim countries are particularly likely to have state religions.

religion concentration variable, are particularly subject to measurement error in this region.[23] Hence, the dummy variable for sub-Saharan Africa may enter significantly because it goes beyond the religion concentration variable in signaling relatively low concentration of religious adherence in Africa.

We carried out the estimation for Table 3, column 1, under the restriction that the coefficients of a set of explanatory variables in the 2000 equation were the same as those in the 1970 equation. This set of variables comprises religion concentration, contemporaneous and lagged Communism, the Muslim adherence share, the dummy variable for sub-Saharan Africa, and constant terms. A joint test for equality of these coefficients is accepted with a p-value of 0.17.[24] Thus, this test validates the model's hypothesis—that the coefficients β in equation (1) are the same in 2000 and 1970—and justifies our imposition of these restrictions for the estimates presented in Table 3.

Column 3 of Table 3 is the same as column 1, except that we add as an explanatory variable a measure of the state of economic development—the log of real per capita GDP. The basic data on GDP are the purchasing-power adjusted numbers from Heston, Summers, and Aten (2002). We entered the 1995 values, rather than those for 2000, in the equation for 2000 in order to increase the number of observations. Nevertheless, the necessity of having data on real GDP results in a serious loss of observations—40 countries in 2000 and 74 countries in 1970. Moreover, the selection of which countries lack GDP data is not random—for example, only 5 of the 35 countries designated as Communist in 1970 have GDP data for 1970.

[23] This interpretation is supported by the discussions of data sources for African countries in Barrett (1982)—see, for example, the discussion for Nigeria on p. 527. Lack of census information, especially outside of the major cities, is an important problem.

[24] The main differences in the estimated coefficients for 2000 and 1970 are for the Communism variables, contemporaneous and lagged.

Since the main idea is to introduce an indicator of the state of economic development, we used information on life expectancy at birth and some other variables to construct proxies for real per capita GDP for the countries that lacked GDP data. Specifically, we used fitted values derived from regressions of the log of per capita GDP on the following variables: the contemporaneous log of life expectancy at birth, two geography measures—the absolute value of degrees latitude and a dummy for land-locked status—dummy variables for Communism, and the contemporaneous share of Muslim adherence. The R-squared values for these regressions are reasonably high—0.79 in 1995 and 0.70 in 1970—and we think that the resulting fitted values serve adequately as proxies for the standard of living.[25]

The coefficient for the log of per capita GDP in column 3 of Table 3 is negative, -0.040, but is not quite statistically significant at the 5% level.[26] Thus, we find only weak support for the secularization view, which predicts a negative effect of economic development on the likelihood of state religion.[27] This interpretation views the coefficient on the log of per capita GDP as an influence from per capita GDP to the probability of state religion. In the three-stage least-squares systems, we allow for reverse causation from state religion to per capita GDP.

The probability of state religion is unrelated to country size. If we add the log of population to the equations for 2000 and 1970, the estimated coefficient differs insignificantly from zero. For example, for the specification that includes the log of per

[25] Life expectancy has the most explanatory power in these regressions (positive). However, absolute degrees latitude is also important (positive), as is Communism in 1970 (negative). Muslim adherence has substantial explanatory power for 1995 per capita GDP (negative).

[26] Measurement error in the GDP variable would tend to bias the estimated coefficient toward zero. However, this consideration should be less important for the three-stage least-squares estimate, which we consider later.

[27] In McCleary and Barro (2003), we did find statistically significant negative effects of per capita GDP on religiousness, as gauged by church attendance and religious beliefs.

capita GDP—Table 3, column 3—the estimated coefficient on the log of population is 0.002, s.e. = 0.016. Thus, the size effect predicted by Mulligan and Shleifer (2004) does not operate for state religion.

We considered influences from prior colonial status by using a breakdown into British, French, Spanish or Portuguese, and other colonies.[28] We carried out this analysis as a supplement to the specification in Table 3, column 3, which includes the log of per capita GDP. If we consider all colonies as a group versus non-colonies, the estimated coefficient on the colony dummy variable differs insignificantly from zero (0.09, s.e. = 0.13, using the SUR technique). Column 5 of Table 3 shows the results when the colonies are broken down into the four types—British, French, Spanish or Portuguese, and others. In this case, none of the individual coefficients are statistically significantly different from zero. However, the four dummy variables are jointly significant (p-value = 0.022). The main effect picked up here is that the point estimate for British colonies is positive (in comparison with the left-out category of non-colonies), whereas that for Spanish and Portuguese colonies is negative. In other words, British colonies are more likely than Spanish or Portuguese colonies to have state religions. This pattern was not obvious, ex ante.

To see whether the colonial influences worked through legal origins, we used the legal-origins variable developed by La Porta, et al (1998). We added dummy variables for British (common-law) and French (statute-law) legal systems to the specification in

[28] Countries that were contemporaneously or formerly dependent on the Soviet Union, such as those in Eastern Europe, are not treated as current or former colonies. Similarly, contemporaneous or former republics of the Soviet Union and Yugoslavia are not classed as current or former colonies.

Table 3, column 3.[29] Neither of these legal-origins variables is individually statistically significant, but the two are jointly significant (p-value = 0.007). If we also include colony dummies, as in column 5 of Table 3, the two legal-origins variables are no longer jointly statistically significant (p-value = 0.15). However, when we include the two legal-origins variables, the four colony dummy variables are also not jointly statistically significant (p-value = 0.28). Thus, the data do not allow us to distinguish the effects from legal origins from those of colonial history more generally.

We examined the relationship of state religion to indicators of democracy, civil liberties, and the rule of law. We used the Freedom House measures of democracy (electoral rights) and civil liberties for 1972, the first year of availability. We used the rule-of-law indicator from Political Risk Services (from their *International Country Risk Guide*) for 1985, the first year of broad availability. The result is that all of these variables, when added one at a time to the equations that include the log of per capita GDP (column 3 of Table 3), have statistically insignificant coefficients. Thus, we find no evidence that the political forces that generate state religion are related to the forces that promote democracy and the rule of law.[30]

We mentioned that some of the designations of state religions by Barrett (1982) and Barrett, Kurian, and Johnson (2001) are controversial. Three noteworthy cases are Spain, Portugal, and Italy, which Barrett, et al classify as having Catholic state religions in 2000 (as well as in 1970 and 1900).

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[29] The three omitted categories are German, Scandinavian, and socialist. The socialist category is similar to our Communism variable.

[30] Mulligan, Gil, and Sala-i-Martin (2003, Table 3) report a statistically significant negative relation between democracy and a measure of regulation of religion. However, their results are hard to relate to ours because their measure of religious regulation is whether a state religion exists (as indicated by Barrett [1982] and Barrett, Kurian, and Johnson [2001]) or whether a country is indicated by Barrett, et al to have lots of atheists.

For Spain, movements away from the official status of the Catholic Church occurred after President Franco's death in 1975—in particular, a 1978 referendum ratified a new constitution in which the state no longer was deemed to have an official religion. Barrett, et al argue, however, that the situation remained one in which the Catholic Church had a special relationship with the government—they note, for example, that the constitution also says: "The public authorities will keep in mind the religious beliefs of the Spanish society and will maintain cooperation with the Catholic Church and other confessions." Similarly, in Portugal, movements away from the monopoly status of the Catholic Church occurred after the death of President Salazar in 1969. The monopoly position of the Church was weakened by the Law of Religious Liberty in 1971 and, even more so, by actions taken by the left-wing government that came to power with the coup in 1974. Barrett, et al argue, however, that the prominent legal position of the Catholic Church was only modified, not eliminated. Again in Italy, the official status of the Catholic Church was weakened in the 1970s by modifications of the concordat that had been in place since 1929. However, Barrett, et al argue that the official position of the Catholic Church remained preeminent.

To see whether the results are sensitive to the classifications of state religion for Spain, Portugal, and Italy, we reran the system (Table 3, column 1) with the three designations changed to no state religion in 2000. With this change, the fit worsens—the R-squared value for the 2000 equation falls from 0.56 to 0.51. However, the coefficients do not change greatly from those found before. The main change is that the coefficient on state religion in 1900 for countries in 2000 with no regime change falls from 0.748 (s.e. = 0.086) to 0.659 (0.092). Thus, our conclusion is that, although Barrett, et al's

designations of state religion are controversial in some cases, the basic results are likely to be robust to reasonable changes in these designations.

We also mentioned that our classification of regime change was debatable in some cases—specifically, we were uncertain about the labeling of Japan, South Korea, and Turkey as having experienced no major regime change since 1900. If we change the classifications of these three cases to having regime changes by 1970, our fitted model improves. For the specification in column 1 of Table 3, the R-squared values rise from 0.56 to 0.58 for the 2000 equation and from 0.73 to 0.76 for the 1970 equation. The reason for the improvement in fits is that the three countries at issue had state religions in 1900 but dropped them by 1970. Thus, classifying these countries as having experienced a regime change makes it easier to fit the transitions in state religion. Consistent with this perspective, the most notable change in the coefficients is an increase for the dummy variable for state religion in 1900 among countries with no regime change (to 0.797 [0.082] for 2000 and 0.944 [0.054] for 1970).

B. Three-Stage Least-Squares Estimates of Linear Probability Models

Columns 2, 4, and 6 of Table 3 use instrumental variables (three-stage least squares or 3SLS) to deal with two-way causation between state religion and two of the explanatory variables: religion concentration and the log of per capita GDP. For religion concentration, our idea is to use information from 1900. Essentially, the 3SLS systems relate the existence of state religion in 2000 and 1970 not to contemporaneous religion concentration but rather to the concentration that could have been predicted from the values of religion concentration that prevailed in 1900.

To sort out directions of causation between state religion and religion concentration, the main issue in our context is whether the presence of state religion in 1900 has predictive power for religion concentration in 2000 and 1970. If so, reverse causation from state religion to religion concentration is likely to be important, and the SUR estimates shown in Table 3 would tend to be biased. Since we use the 1900 value of religion concentration as an instrument, we also want to know whether this variable has substantial predictive power for religion concentration in 2000 and 1970. If not, the instrument would be "weak" and would not give reliable results—see Staiger and Stock (1997).

To address these issues, we ran "first-stage" regressions with religion concentration in 2000 and 1970 as the dependent variables. The explanatory variables were the values in 1900 for state religion and religion concentration, the contemporaneous Muslim adherence share,[31] and dummy variables for sub-Saharan Africa and Communism. The state-religion variable for 1900 was interacted with the regime-change variable for 2000 or 1970.[32] Statistically significant variables for explaining religion concentration in 2000 or 1970 were the 1900 value of religion concentration (positive), the Muslim adherence share (positive), and the sub-Saharan African dummy (negative). All of these coefficients had p-values less than 0.01. For countries with regime changes, the status of state religion in 1900 had no predictive content. However, for countries with no regime change, the coefficients on state religion in 1900 were positive and statistically significant—0.089 (s.e. = 0.037) for 2000 and

[31] We also estimated systems in which the contemporaneous Muslim adherence share was treated as endogenous, with the 1900 Muslim adherence share taken as exogenous. The 3SLS results for the linear probability models with this specification were very close to those reported in Table 3.
[32] We are treating regime change as exogenous with respect to religion concentration.

0.085 (0.033) for 1970. Thus, there is some evidence that the past presence of state religion predicts concentration of religious adherence 70 or 100 years later. This result suggests a possible simultaneity bias in the coefficients estimated by the SUR technique in Table 3. We deal with this problem by using religion concentration in 1900 as an instrument for contemporaneous religion concentration—the high explanatory power for religion concentration in 1900 suggests that this instrument would not be weak.

Column 2 of Table 3 shows three-stage least-squares estimates of the linear probability model for state religion in 2000 and 1970. The instrument lists exclude contemporaneous religion concentration but include the values for 1900. The main differences from the previous results (shown in column 1) are in the coefficients for religion concentration and the Muslim adherence share. Religion concentration is still positive and statistically significant—in fact, the coefficient is higher than before. Therefore, the allowance for endogeneity of religion concentration leaves intact the conclusion that greater concentration makes state religion more likely. However, the coefficient for Muslim adherence becomes smaller and is no longer statistically significant.[33] Hence, the effect of Muslim adherence on the probability of state religion is not reliably determined—the results are sensitive to the estimation procedure.

Column 4 of Table 3 shows three-stage least-squares estimates for the model that includes the log of per capita GDP. We now treat the log of per capita GDP, as well as religion concentration, as endogenous. Since we lack data on per capita GDP in 1900 for

[33] The result on religion concentration is surprising because, with a positive effect of state religion on religion concentration, the instrumental estimate of the concentration coefficient would tend to be smaller than the one estimated by SUR. The reason the point estimate becomes larger seems to involve an interaction with the Muslim adherence variable. For given religion concentration in 1900, Muslim adherence in 1970 or 2000 "predicts" higher contemporaneous religion concentration. Therefore, the instrumental estimate of the concentration coefficient picks up a positive effect from Muslim adherence. When this effect is held constant, the estimated coefficient on the Muslim adherence variable becomes smaller.

most of the countries, we include instead as instruments two geographical features mentioned before that have substantial explanatory power for per capita GDP. These features are the absolute value of degrees latitude and the dummy variable for land-locked status.

To assess the first-stage equations for per capita GDP, we ran least-squares regressions with the log of per capita GDP in 1995 or 1970 as the dependent variable. The explanatory variables are the two geography measures, the 1900 values of state religion and religion concentration, the contemporaneous Muslim adherence share, and dummy variables for Communism and sub-Saharan Africa. The result is that degrees latitude has positive coefficients that are significant with p-values less than 0.01, and landlocked-status has negative coefficients with p-values of 0.011 in the equation for 1995 per capita GDP and 0.008 for 1970 per capita GDP. Also significant in these equations are the sub-Saharan African dummy (negative with p-values less than 0.01), the Muslim adherence share (negative with p-values less than 0.01), and the dummy variable for Communism in 1970 (negative with p-values less than 0.01). State religion from 1900 is negative but only marginally significant. One important finding is that the two geographical features have substantial explanatory power and would therefore not be weak instruments for the log of per capita GDP.

The three-stage least-squares estimate of the coefficient of the log of per capita GDP (Table 3, column 4) is -0.08, s.e. = 0.06. Thus, as before (column 3), the effect of per capita GDP is not statistically significantly different from zero.[34] We conclude that

[34] One concern is that, over long periods, the land-locked variable is endogenous because it reflects changes in country borders. For example, Bolivia currently lacks access to the sea because it lost its coastline in a war with Chile in the late 1800s. Moreover, this military defeat might somehow be related to Bolivia's potential per capita GDP. In any event, our results are similar if we drop the land-locked dummy variable

an allowance for the endogeneity of per capita GDP with respect to state religion does not change the basic finding. We still lack evidence that increases in per capita GDP decrease the probability of state religion.[35]

Column 6 of Table 3 shows three-stage least-squares estimates when the colony dummy variables are added to the equations from column 4. (The colony dummy variables and their interactions with the regime-change variables are included in the instrument lists.) The results for prior colonial status are similar to those found in column 5.[36]

C. Probit Estimates of Probability Models

Table 4 shows coefficient estimates for a probit model for the probability of state religion in 2000 and 1970.[37] This system parallels the linear probability model in column 1 of Table 3. As before, the statistically significant coefficients in Table 4 are for state religion in 1900 (positive for countries without and with a regime change), religion concentration (positive), contemporaneous Communism (negative), and the sub-Saharan Africa dummy (negative). The Muslim coefficient is positive but no longer statistically

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from the instrument lists. In this case, the estimated coefficient on the log of per capita GDP is -0.05, s.e. = 0.06.

[35] These results suggest that the dummy variable for the presence of state religion in 1970 was satisfactory as an instrumental variable for religiosity in our study of economic growth from 1965 to 1995 (Barro and McCleary [2003]).

[36] If we consider only colonies versus non-colonies, the coefficient on colony is again statistically insignificant from zero—the estimate is 0.06, s.e. = 0.14.

[37] See Wooldridge (2002, chapter 15) for a discussion of probit estimation. We estimate the probit model by maximum likelihood, subject to coefficient restrictions implied by the latent model based on Eq. (1). Specifically, the probit coefficients on the independent variables Z (religion concentration, current and lagged Communism, Muslim adherence, sub-Saharan Africa dummy, and a constant) are the same for 2000 and 1970. In addition, in 2000 and 1970, the ratio of the probit coefficient on state religion in 1900 for no regime change to that for a regime change equals the ratio of the coefficients λ_1 and λ_2 applied to the independent variables Z. We also allow the error terms for 2000 and 1970 to be correlated.

significant at the 5% level. Lagged Communism has an insignificant effect, as before.[38]

Much easier to interpret than the probit coefficients in Table 4 are the implied marginal effects of each right-hand-side variable on the probability of state religion. Because these models are non-linear, the marginal effects depend on the values of all of the independent variables and are, therefore, different for each country and year. The values shown in column 2 give the sample average of the marginal effects for the continuous variables—religion concentration and Muslim adherence share. For the dummy variables, the values give the sample average effect from a change in each dummy variable from 0 to 1.[39] In the main, the marginal effects shown in column 2 are close to the coefficients of the linear probability model shown in column 1 of Table 3. Hence, the linear probability models give a reasonable picture of the average marginal effects of each explanatory variable on the probability of state religion.

The pseudo R-squared values in Table 4 parallel usual R-squared measures—they equal one minus the ratio of the unexplained sum of squared residuals to the total sum of squared deviations of the dependent variable around its mean. These values are comparable to the R-squared values shown for the linear probability model in column 1 of Table 3. The values in Table 4 are higher because the non-linear aspects of the probit improve on the fit. Notably, the probit does not err by generating fitted values that are less than zero or greater than one.

Another common measure of goodness of fit for probit models is the fraction of observations correctly predicted by the model. In this calculation, the model is deemed to

[38] If we add the log of per capita GDP to the system, analogous to column 3 of Table 3, we again get a statistically insignificant coefficient: -0.16, s.e. = 0.20.
[39] For state religion in 1900, the averaging is over the respective sub-samples: 2000 without and with a regime change and 1970 without and with a regime change.

be correct if an observation of no state religion matches up with a fitted probability less than 0.5 and if an observation of state religion matches up with a fitted probability greater than 0.5. Otherwise, the model is deemed to be incorrect. Column 1 of Table 4 shows that the probit model correctly predicts overall for 90% of the cases (339 of 377). The breakdown is 86% correct in 2000 (162 of 188) and 94% correct in 1970 (177 of 189). The percentages correct are similar for cases where state religion is absent or present.

To get a more modest perspective on the fit, we can compare the probit model with a naïve model that says that the status of state religion in 1970 and 2000 is the same as that in 1900. This model would have been correct for 142 of 188 cases or 76% in 2000 and 145 of 189 cases or 77% in 1970. If we add to the naïve model the proposition that Communist countries lack state religions, we would have been correct for 146 of 188 cases or 78% in 2000 and 168 of 189 cases or 89% in 1970.[40] Thus, from Table 4, the rest of the probit model improves the prediction by 16 countries in 2000 and 9 countries in 1970.

We can list the countries that have the largest residuals in the probit equations. Two notable errors are for Turkey—the absence of state religion matches up with fitted probabilities of 0.90 in 1970 and 0.97 in 2000.[41] Turkey's surprising status as a secular state may owe a lot to the individual influence of President Ataturk in the 1920s. Another large error is for Syria (0 in 2000, fitted of 0.99), which abandoned a Muslim state religion in 1973 under the new constitution instituted by President El-Assad. Other large residuals are for Vanuatu (1 in 2000, fitted of 0.06), Bulgaria (1 in 2000, fitted of

[40] For Somalia in 1970, the two naïve rules are inconsistent—the country had a state religion, as in 1900, but it was also Communist. The calculation assumes that the naïve model incorrectly predicts Somalia.
[41] Note that the 2000 equation does not update for the status of state religion in 1970. The 2000 equation considers only the status of state religion in 1900.

0.07), Brazil (0 in 1970, fitted of 0.89), Chile (0 in 1970, fitted of 0.89), Japan (0 in 1970, fitted of 0.89), South Korea (0 in 1970, fitted of 0.88), Ireland (0 in 2000, fitted of 0.86), Somalia (1 in 1970, fitted of 0.15), and Israel (1 in 2000, fitted of 0.17).

IV. Concluding Observations

We used a framework of political-institutional choice to assess the probability of the presence of state religion. Our empirical application of this framework for 2000 and 1970 shows that state religion is far more likely to exist when it existed in 1900. However, the persistence is much stronger for countries that have experienced no major change in political regime than for countries that have experienced such a change. For countries with no major regime changes, the rate of decay is slow enough so that religious institutions from the distant past—such as those at the time of the Reformation in the1500s—would still matter substantially for the shape of present day institutions.

Communism has a strong negative effect on the probability of state religion—our sample contains only one Communist country (Somalia in 1970) with state religion in the usual sense. However, past Communism has little influence on the probability of state religion.

Consistent with theoretical reasoning, a greater concentration of religious adherence is positively associated with state religion. Our results indicate that this association reflects mainly the positive effect of religion concentration on the probability of state religion, rather than the reverse effect of state religion on concentration.

Theoretically, we expect that state religion would be more likely in countries with heavy representation in monotheistic religions. Empirically, we find this positive relation

for Muslim adherence, but this relationship is not robust. We find that location in sub Saharan Africa has a significantly negative effect on the probability of state religion. We think that this relation reflects the strong competition among the major world religions for religious converts in Africa.

The secularization hypothesis predicts that increases in per capita GDP would reduce the probability of state religion. We find little support for this hypothesis. State religion is also unrelated to country size and to indicators of democracy, civil liberties, and the rule of law. Former colonies as a whole do not differ from non-colonies in the likelihood of state religion. However, British colonies are more likely than Spanish or Portuguese colonies to have a state religion. Given prior colonial status, the probability of state religion is unrelated to the presence of British (common-law) or French (statute-law) legal systems.

In future research, we plan to look more deeply at the interactions between state and religion, particularly at freedom of religious expression, regulation and subsidy of religion, and religiously inspired laws and regulations. We want to consider further how freedom and regulation in the religion market relate to other forms of freedom and regulation. Included here are freedoms of speech and mobility and the supervision of industry.

Our interest in this study began with the institution of state religion. However, the methodology that we developed can be applied to studies of the long-term evolution of other legal and institutional features of countries. For example, the method could be applied to the long-term evolution of monarchy, forms of electoral systems, government ownership, and so on. We plan to consider these kinds of applications in future research.

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Table 1a			
Countries with No State Religion in 2000, 1970, 1900 (N=72)			
Antigua	Gabon	Mauritius	Seychelles
Australia	Gambia	Mexico	Sierra Leone
Austria	Germany*	Micronesia	Singapore
Belgium	Ghana	Myanmar	Slovak Rep.
Belize	Grenada	Namibia	Solomon Isl.
Bosnia	Guinea	Niger	South Africa
Cameroon	Guyana	Nigeria	Suriname
Canada	Hungary	Nicaragua	Switzerland
Comoros	India	Netherlands	Tanzania
Congo (Brazz.)	Ivory Coast	New Zealand	Togo
Cyprus	Jamaica	Philippines	Trinidad
Czech Rep.	Kenya	Papua N.G.	Uganda
Djibouti	Kiribati	Poland	United States
Dominica	Lesotho	St. Kitts	Uruguay
Ecuador	Madagascar	St. Lucia	Vietnam
Estonia	Malawi	St. Vincent	Yugoslavia
Fiji	Mali	San Marino	Zambia
France	Marshall Islands	Senegal	Zimbabwe
*Separated into East and West in 1970.			

Table 1b		
Countries with State Religion in 2000, 1970, 1900 (N=58)		
Catholic (21)	**Muslim (22)**	**Protestant (9)**
Andorra	Afghanistan*	Bahamas
Argentina	Algeria	Denmark
Bolivia	Bahrain	Finland
Colombia	Brunei	Iceland
Costa Rica	Egypt	Liberia
Dominican Rep.	Iran	Norway
El Salvador	Iraq	Samoa
Guatemala	Jordan	Tonga
Haiti	Kuwait	United Kingdom**
Honduras	Libya	
Italy	Malaysia	**Orthodox (1)**
Liechtenstein	Maldives	Greece
Luxembourg	Mauritania	
Malta	Morocco	**Buddhist (4)**
Monaco	Oman	Bhutan
Panama	Qatar	Cambodia***
Paraguay	Saudi Arabia	Sri Lanka
Peru	Somalia	Thailand
Portugal	Sudan	
Spain	Tunisia	**Hindu (1)**
Venezuela	United Arab Emir.	Nepal
	Yemen	
*Afghanistan lacked a state religion from 1978 until the mid 1990s.		
**Anglican in England, Presbyterian in Scotland. Anglican disestablished in Ireland in 1869 and in Wales in 1919.		
***Cambodia lacked a state religion from the mid 1970s until 1989.		

Table 1c Countries with State Religion in 1900 that Abandoned State Religion by 1970 (N=29)		
Catholic (7)	**Protestant (2)**	**Confucian (4)**
Brazil	Botswana	China
Chile	Indonesia	North Korea
Congo (Kinshasa)		South Korea
Cuba	**Orthodox (4)**	Taiwan
Equatorial Guinea	Kazakhstan	
Lithuania	Latvia	**Ethno-religion (7)**
Slovenia	Romania	Benin
	Russia	Burkina Faso
Muslim (3)		Burundi
Albania	**Buddhist (2)**	Central African Rep.
Lebanon	Japan*	Chad
Turkey	Mongolia	Rwanda
		Swaziland
*Shinto		

Table 1d Countries with State Religion in 1900 that Abandoned State Religion by 2000 (N=12)		
Catholic (6)	**Muslim (1)**	**Orthodox (2)**
Angola	Syria	Eritrea
Cape Verde		Ethiopia
Guinea-Bissau	**Protestant (2)**	
Ireland	Barbados	**Buddhist (1)**
Mozambique	Sweden	Laos
Sao Tome		

Table 1e Countries with State Religion in 1900 that Abandoned State Religion by 1970 but Reinstated State Religion by 2000 (N=12)	
Catholic (1)	**Orthodox (6)**
Croatia	Armenia
	Belarus
Muslim (5)	Georgia
Azerbaijan	Macedonia
Kyrgyz Rep.*	Moldova
Tajikistan*	Ukraine
Turkmenistan*	
Uzbekistan*	
*Orthodox in 1900, Muslim in 2000.	

Table 1f Countries with No State Religion in 1900 that Introduced State Religion by 1970 (N=3)
Muslim (2)
Bangladesh*
Pakistan
Jewish (1)
Israel
*Bangladesh lacked a state religion from 1972 to 1975.

Table 1g Countries with No State Religion in 1900 that Introduced State Religion by 2000 (N=2)
Protestant (1)
Vanuatu
Orthodox (1)
Bulgaria*
*2001

Table 2 Means and Standard Deviations of Variables		
(unweighted averages across countries)		
Data for 2000 (N=188)		
Variable	**Mean**	**Stnd. Dev.**
State religion	0.40	0.49
Regime change	0.72	0.45
Religion concentration	0.55	0.23
Communist	0.03	0.16
Muslim adherence share	0.23	0.35
Sub-Saharan Africa dummy	0.26	0.44
log(per capita GDP, 1996 US$)	8.33	1.04
log(population, 1000s)	8.57	2.09
British colony	0.31	0.47
French colony	0.15	0.36
Spanish & Portuguese colony	0.12	0.33
Other colony	0.08	0.27
Absolute degrees latitude	25.5	16.8
Land-locked status	0.22	0.41
British legal origin	0.32	0.47
French legal origin	0.43	0.50
Adherence shares:		
Muslim	0.235	0.346
Catholic	0.289	0.332
Protestant	0.137	0.207
Other Christian	0.084	0.112
Orthodox	0.054	0.163
Jewish	0.005	0.056
Hindu	0.022	0.095
Buddhist	0.036	0.141
Other Eastern religion	0.019	0.071
Other religion	0.057	0.110
Non-religious	0.062	0.105

Table 2, continued		
Data for 1970 (N = 189*)		
Variable	**Mean**	**Stnd. Dev.**
State religion	0.39	0.49
Regime change	0.60	0.49
Religion concentration	0.59	0.24
Communist	0.18	0.39
log(per capita GDP, 1996 US$)	8.02	1.14
log(population, 1000s)	8.01	2.11
Adherence shares:		
Muslim	0.218	0.344
Catholic	0.298	0.353
Protestant	0.134	0.221
Other Christian	0.070	0.107
Orthodox	0.050	0.151
Jewish	0.006	0.062
Hindu	0.022	0.105
Buddhist	0.037	0.153
Other Eastern religion	0.016	0.071
Other religion	0.075	0.146
Non-religious	0.074	0.157
*East and West Germany included separately.		
Data for 1900 (N = 188)		
State religion	0.59	0.49
Religion concentration	0.74	0.20
Adherence shares:		
Muslim	0.214	0.357
Catholic	0.259	0.378
Protestant	0.127	0.264
Other Christian	0.028	0.073
Orthodox	0.065	0.200
Jewish	0.005	0.014
Hindu	0.022	0.101
Buddhist	0.041	0.164
Other Eastern religion	0.014	0.089
Other religion	0.222	0.361
Non-religious	0.003	0.027

Table 3 Linear Probability Models for State Religion in 2000 and 1970 (standard errors of coefficients in parentheses)						
Estimation method:	**SUR**	**3SLS**	**SUR**	**3SLS**	**SUR**	**3SLS**
Independent variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
State religion, 1900, no regime change coeff. for 2000:	0.748** (0.086)	0.769** (0.098)	0.749** (0.085)	0.748** (0.093)	0.780** (0.070)	0.784** (0.076)
coeff. for 1970:	0.906** (0.055)	0.937** (0.057)	0.906** (0.055)	0.934** (0.060)	0.898** (0.047)	0.920** (0.050)
State religion, 1900, regime change coeff. for 2000:	0.311** (0.055)	0.277** (0.060)	0.305** (0.055)	0.264** (0.060)	0.352** (0.055)	0.334** (0.058)
coeff. for 1970:	0.284** (0.049)	0.263** (0.053)	0.284** (0.049)	0.249** (0.052)	0.323** (0.049)	0.299** (0.052)
Religion concentration	0.706** (0.166)	1.237** (0.422)	0.730** (0.167)	1.523** (0.320)	0.833** (0.183)	1.663** (0.361)
Communism	-0.491** (0.080)	-0.493** (0.078)	-0.509** (0.080)	-0.513** (0.082)	-0.529** (0.086)	-0.547** (0.090)
Lagged Communism	-0.170* (0.086)	-0.105 (0.090)	-0.160 (0.085)	-0.070 (0.086)	-0.066 (0.125)	-0.005 (0.127)
Muslim adherence share	0.371** (0.106)	0.166 (0.189)	0.331** (0.108)	-0.009 (0.162)	0.267* (0.117)	-0.091 (0.182)
Sub-Saharan Africa	-0.478** (0.073)	-0.396** (0.094)	-0.515** (0.076)	-0.437** (0.103)	-0.506** (0.084)	-0.412** (0.112)
log(per capita GDP)	--	--	-0.040 (0.022)	-0.080 (0.059)	-0.045 (0.024)	-0.089 (0.067)
British colony	--	--	--	--	0.237 (0.146)	0.203 (0.151)
French colony	--	--	--	--	0.087 (0.151)	0.024 (0.156)
Spanish or Portuguese colony	--	--	--	--	-0.206 (0.192)	-0.394 (0.208)
Other colony	--	--	--	--	-0.073 (0.156)	-0.080 (0.169)
p-value, colonies	--	--	--	--	0.022	0.008
No. observations, 2000 and 1970	188, 189	188, 189	188, 189	188, 189	188, 189	188, 189
R-squared, 2000 and 1970	0.56, 0.73	0.54, 0.72	0.56, 0.73	0.52, 0.70	0.58, 0.74	0.55, 0.72

*p-value < 0.05, **p-value < 0.01.

Note to Table 3

Constant terms are included but not shown. The dependent variable is a dummy for the presence of state religion in 2000 or 1970. The sample for 1970, 189 countries, exceeds that for 2000, 188 countries, because East and West Germany are included separately in 1970. The estimates weight all countries equally. The equations are estimated as a system, using the seemingly-unrelated (SUR) technique in columns 1, 3, and 5, and three-stage least-square (3SLS) in columns 2, 4, and 6. The instrument lists in columns 2, 4, and 6 exclude the contemporaneous values of religion concentration and the Muslim adherence share but include the 1900 values (along with interaction terms with the regime-change variable). The instrument lists for columns 4 and 6 also replace the contemporaneous value of the log of per capita GDP by the absolute value of degrees latitude and a dummy variable for land-locked status, along with interactions of these variables with the regime-change variable. In column 6, the dummy variables for colonial status appear in the instrument lists, along with interactions with the regime-change variable.

Table 4 Probit Model for State Religion in 2000 and 1970 (standard errors of coefficients in parentheses)		
	(1)	(2)
Independent variable	**coefficient**	**marginal effect on probability**
State religion in 1900, no regime change, coefficient for 2000	3.26** (0.61)	0.81
State religion in 1900, no regime change, coefficient for 1970	4.37** (0.52)	0.89
State religion in 1900, regime change, coefficient for 2000	1.78** (0.38)	0.32
State religion in 1900, regime change, coefficient for 1970	1.81** (0.34)	0.20
Religion concentration	5.69** (1.17)	0.73
Communism	-3.77** (1.08)	-0.42
Lagged Communism	-0.47 (0.69)	-0.06
Muslim adherence share	1.93 (1.04)	0.25
Sub-Saharan Africa	-3.22** (0.92)	-0.42
Number of observations, 2000 and 1970	188, 189	
Pseudo R-squared, 2000 and 1970	0.66, 0.74	
% correctly predicted		
overall sample	90% (339/377)	
state religion sample	91% 134/148)	
no state religion sample	90% (205/229)	
2000 sample	86% (162/188)	
1970 sample	94% (177/189)	

*p-value < 0.05, **p-value < 0.01.

Note: Constant terms are included but not shown. For the continuous variables (religion concentration and Muslim religion share), the marginal effects in column 2 show the sample average of the effect on the probability of state religion from a marginal change in each independent variable. For the dummy variables, column 2 shows the sample average effect on the probability of state religion from a shift from zero to one in each variable. For state religion in 1900, the averaging is over sub-samples defined by 2000 or 1970 and no regime change or regime change. See the text (n. 28) for a discussion of the probit estimation.