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Religion, Corruption, and the Rule of Law

In a 207-country sample, we find that rule of law and corruption are both associated with a country's religious heritage, thereby partially explaining the correlation between religion and economic growth found in previous research. We also show that our results change when we control for some variables lacking data for all countries in the sample but that these differences are attributable to changes in sample composition rather than the effects of the control variables. Our research suggests that researchers doing cross-country analysis should distinguish between the effects of adding a control variable and the resulting sample composition effects.

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Recent research suggests that a connection exists between religion and economic growth, but substantial questions remain regarding the mechanisms through which religion might influence economic growth. As a result, any causal factors underlying this statistical relationship presently are hiding in a "black box" or, at most, a dimly lit box.

This paper peers into that black box to shine light on two possible mechanisms by which religion might influence growth. First, religion might increase the demand for and compliance with strong legal institutions and the rule of law. Second, religion may also have the beneficial effect of discouraging corrupt practices within a society. Both stronger rule of law and lower corruption have been shown to have a positive

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effect on economic growth (e.g., Scully 1988, Knack and Keefer 1995, Mauro 1995, Barro 1997, 2003, La Porta et al. 1998, Rodrik 1999). In this paper, we examine whether a nation's dominant religious culture affects the rule of law and the degree of control over corruption. We conclude that (i) the rule of law is stronger in countries whose largest religious group in the year 1900 was Protestantism, Catholicism, or Hinduism; (ii) corruption is lower in countries whose largest religious group in 1900 was Protestantism; and (iii) rule of law is stronger and corruption is lower in countries whose largest religious group in 2000 was an Asian ethnoreligion. We also find that these results are more robust when controlling for the largest religion in 1900 rather than in 2000. As we explain below, the variation in results for 1900 versus 2000 is likely an effect of widespread 20th-century conversions in Africa and the Pacific Islands from ethnic religions to Catholicism, Islam, and Protestantism.

The seminal work on the connection between religion and economic prosperity was Max Weber's *The Protestant Ethic and the Spirit of Capitalism*. In that essay, Weber argued that Protestantism, especially of the Calvinist variety, was central to the rise of what he called the "spirit of capitalism." That is, he viewed Protestantism as having taught a particular mindset that made one's occupation a calling from God and legitimated the acquisition of wealth through that calling. This spirit of capitalism was essential, according to Weber, in the economic success of Western Europe. Although Weber's hypothesis has been refuted empirically on both theological and historical grounds (e.g., Samuelsson 1961, Delacroix and Nielsen 2001, Stark 2004, 2005, Arruñada 2010), economists in recent years have been exploring the broader idea suggested by Weber: that religious belief and culture can have profound economic effects.

The most thorough attempt to examine the link between religion and economic growth is Barro and McCleary (2003). They conclude that belief in heaven and (especially) belief in hell were associated with higher levels of economic growth. Similarly, Shariff and Rhemtulla (2012) find that belief in hell was associated with lower crime rates. Barro and McCleary also find that growth was higher in countries with higher proportions of Catholics, eastern religions, and Jews. However, Durlauf, Kourtellos, and Tan (2012) call into question the robustness of Barro and McCleary's findings on religion. Using Bayesian model averaging, Durlauf, Kourtellos, and Tan conclude that neither belief in hell nor belief in heaven was a robust determinant of economic growth, although monthly church attendance was significantly and negatively related to economic growth. Sala-i-Martin, Doppelhofer, and Miller (2004) and Fernández, Ley, and Steel (2001) both find a correlation between economic growth and the population shares of certain religions using Bayesian averaging approaches similar to Durlauf, Kourtellos, and Tan. Blum and Dudley (2001) conclude that predominantly Protestant cities in Europe experienced faster population (and, by assumption, economic) growth from 1500 to 1750 than Catholic cities. Their proposed mechanism for the Protestant advantage was the emergence of superior trading and information networks linked to Protestantism and centered around London.

At the level of simple correlations, there is wide variation in the average GDP per capita across countries, depending on the countries' largest religious groups. As we explain in more detail in Section 1, we have categorized 207 countries and territories according to each country's largest religious group in two different years—1900 and 2000. As Table 2 shows, there are substantial differences in current average GDP per capita depending on which religious group is a country's largest, and depending on whether we base a country's religious categorization on the year 1900 or the year 2000. Many of the differences in means in GDP per capita shown in Table 2 are statistically significant.

Overall, the literature suggests that there are significant variations in aggregate economic outcomes that are correlated with religion. However, the reasons behind such correlations are not well understood. In recent years, a number of economists have studied possible underlying mechanisms. For example, Guiso, Sapienza, and Zingales (2003) use international survey response data to find that religious people had higher levels of trust in others and in the government, were less willing to break the law, and were more likely to believe that market outcomes are fair—attitudes that are generally associated with increased economic growth. Overall, Guiso, Sapienza, and Zingales conclude that religion contributes positively to attitudes that favor economic growth and that these outcomes vary across religious groups. Similar studies include Daniels and von der Ruhr (2005), who find that religious affiliation significantly affected Americans' attitudes related to trade and immigration policies; Arruñada (2010), who, using data from an international sample, shows that Catholics and Protestants differ in their attitudes about the role of government and the trustworthiness of various public and private organizations; and Tabellini (2005), who finds that Protestant population percentage affected attitudes of trust, respect for others, and similar variables in a sample of European regions.

Another line of research has looked at the determinants of good governance, such as measures of the rule of law and corruption. Some of these studies have made limited inquiries into the correlations between religion and governance. In a sample of 124 countries, La Porta et al. (1999) examine how political and religious factors affected a wide array of measures of good governance. Most relevant to our study, they find that countries with higher proportions of Catholics and Muslims had lower property rights protection and higher corruption, although these results were not robust to the inclusion of controls for GNP per capita and latitude.[1] In a similar study, Treisman (2000) studies the determinants of corruption using several corruption indices covering between 36 and 64 countries. Regarding religion, he finds that the percentage of population that is Protestant generally had a small but statistically significant effect in reducing corruption.

1. Similarly, La Porta et al. (1998) analyze the determinants of both the rule of law and the level of corruption in a much smaller cross-section of 49 countries. They conclude that per capita GNP was the strongest determinant of both variables and that the origin of the country's legal system significantly affected corruption but not the rule of law.

Al-Marhubi (2004) examines the determinants of indices of the rule of law and the control of corruption in a sample of 86 countries. Important factors affecting the values of these indices were per capita income, trade openness, latitude, and ethnolinguistic fractionalization. Al-Marhubi also controls for the Protestant population share, which had a significant positive effect on the indices unless per capita income was included in the empirical specification. In addition, Dreher, Kotsogiannis, and McCorriston (2007) study the determinants of corruption in a sample of approximately 100 countries, finding that corruption was lower where there was stronger rule of law, higher educational attainment, and long-standing democracy. Although the results were not reported, Dreher, Kotsogiannis, and McCorriston apparently analyze the impact of religion on corruption but find no significant effects. Finally, Paldam (2001) conducts an analysis of the effect of the population shares of several religions on corruption, as measured for 100 countries by Transparency International in 2000. He finds that a higher share of Protestants was correlated with less corruption compared to Catholic and Orthodox shares, with few other significant results.

We advance the existing literature in several ways. First, we have a larger collection of countries than the articles discussed earlier, with data that include practically every country in the world. In our analyses, we have controlled for several variables for which we do not have data on all countries. We find that changes in our results as we include or exclude such control variables arise mostly from the associated change in sample composition rather than the presence of the particular variable. These variations in outcomes suggest that differences in the literature described earlier could be due to differences in the countries included in the various samples. By having the population of nations in our data set, we avoid the problem of nonrandom sample selection that may be present in the existing literature.

Second, we control for countries' religious demographics in both 1900 and 2000, finding that the results for religious affiliation in 1900 are more robust than those for 2000. We demonstrate that 20th-century conversions to monotheism—which occurred mostly in Africa and the Pacific Islands—have a masking effect on the estimated effects of Protestantism, Catholicism, and Hinduism. As a result, we conclude that future investigations of the connection between religion and economic growth should focus on long-standing historical religious affiliations (such as our data for religious affiliation in 1900) rather than simply relying on contemporary religious data.

In addition, we examine the statistical effect of a country's largest religious group on its rule of law and level of corruption. This approach implicitly emphasizes how religious *culture* might impact governance measures rather than basing inference on doctrinal issues. Finally, we examine the effects of a wider spectrum of religious groups than have been previously examined in most of the governance literature. This results in new information regarding the effects of Hinduism, Orthodox Christianity, and various ethnic religions on the rule of law and corruption.

Overall, we find that stronger rule of law exists in countries with a religious heritage rooted in Protestantism, Asian ethnic religions, Catholicism, or Hinduism,

and that corruption levels are lower in countries that were historically Protestant or are currently Asian ethnic religions. Section 1 of the paper sets forth some theoretical matters and describes our data and empirical methodology. Section 2 presents our results, and Section 3 concludes the paper.

1. THEORETICAL CONSIDERATIONS, DATA, AND METHODOLOGY

Social scientists generally contend that whatever other functions it may serve, religion serves to sustain a social order. Much religious teaching revolves around standards for behavior, and it is possible that a religious society might be more prone to "good" behavior than a less religious one. Of course, this is too broad a statement, because it assumes all religious groups emphasize the same types of behavioral standards. Moreover, religions are likely to be somewhat flexible in their ability to adapt the types of actions deemed "acceptable" in response to long-run changes in circumstances. At a minimum, though, the literature discussed in the previous section suggests that followers of different religions may hold varying opinions on what constitutes acceptable behavior, and it is likely that individual-level commitment to behavioral standards varies within particular religious groups (La Porta et al. 1999; Guiso, Sapienza, and Zingales 2003; Al-Marhubi 2004).

If religious devotion spills over into actions, and if this effect on behavior varies across religious groups, then it is possible that the levels of rule of law and corruption would similarly vary across countries with different religious cultures. The most obvious reason for this is that individuals would be more likely to comply with behavioral standards embodied in the law. But additional reasons exist to expect that a society dominated by a behaviorally strict religion would be more lawful and less corrupt. First, members of such a religion are likely to demand that their government provide a society that at least somewhat conforms to the dominant religious view. Second, where the dominant religion results in people being generally more lawful, enforcement of law and punishment of corruption will be easier and less expensive because there are fewer violators to catch. Thus, we expect that the dominant religious culture will affect the rule of law and the level of corruption.

In large part, though, we are engaged in an empirical exercise to determine which religions have what kinds of effects. In the absence of a thorough comparative theological investigation of all of the major world religions and their various tenets on economic, moral, and cooperative behavior, we are not in a position to speculate on which religions will be more or less conducive to the rule of law and control of corruption. Rather, our purpose is to determine whether such an exhaustive foray into the world of comparative religion might yield explanations of the social mechanisms that lead to the rule of law and the control of corruption, two factors that are important in generating economic growth. After all, if our investigation were to find no differences across religious groups in their association with the rule of law and the control of

TABLE 1

DISTRIBUTION OF INDICES OF RULE OF LAW AND CONTROL OF CORRUPTION

	Number of countries by index	
Value of index	*Rule of Law*	*Control of Corruption*
Index < -2.0	1	0
$-2.0 \leq$ Index < -1.5	8	2
$-1.5 \leq$ Index < -1.0	25	24
$-1.0 \leq$ Index < -0.5	48	58
$-0.5 \leq$ Index < 0.0	31	33
$0.0 \leq$ Index < 0.5	19	28
$0.5 \leq$ Index < 1.0	41	25
$1.0 \leq$ Index < 1.5	17	12
$1.5 \leq$ Index < 2.0	16	8
Index ≥ 2.0	1	13
Mean	−0.005	−0.006
Standard deviation	1.000	0.999
Minimum value	−2.31	−1.65
Maximum value	2.01	2.53
n	207	203

corruption, then there would be little reason for economists to explore the teachings and practices of various religions as they relate to the rule of law or the control of corruption.

Having stated our purpose for conducting this research, we now describe the data and methodology we use in our empirical analysis. To measure the rule of law and the level of corruption, we used indices for the *Rule of Law* and the *Control of Corruption* generated by Kaufman, Kraay, and Mastruzzi (2005) for the World Bank's Governance Research Indicators Country Snapshot (GRICS) data set.[2] For the year 2004, the *Rule of Law* index is available for 207 countries, and the *Control of Corruption* index is available for 203 countries. These sets of countries include virtually every independent nation in the world and a large number of overseas territories. A listing of the countries included in the 2004 GRICS data is available in an appendix posted on the corresponding author's website.

The GRICS indices are compiled from multiple sources of subjective country data and are constructed to have a mean of 0 and a standard deviation of 1 (as evident in Table 1). Kaufman, Kraay, and Mastruzzi (2005) describe the *Rule of Law* index as follows:

2. Kaufman, Kraay, and Mastruzzi (2005) create six different indices: *Rule of Law, Control of Corruption, Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness,* and *Regulatory Quality*. These indices are all highly correlated, with simple correlation coefficients ranging from 0.73 to 0.96. Although a tale could be spun as to how each of these measures is influenced by religion, we chose to focus our analysis on the two indices that are most obviously implicated directly by religious teaching—the ones dealing with general measures of honesty, lawfulness, and trustworthiness. (The simple correlation coefficient between the *Rule of Law* and the *Control of Corruption* indices is 0.95.) Regression results for the other four indices are presented in a separate appendix.

> In "Rule of Law" we include several indicators which measure the extent to which agents have confidence in and abide by the rules of society. These include perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. Together, these indicators measure the success of a society in developing an environment in which fair and predictable rules form the basis for economic and social interactions, and importantly, the extent to which property rights are protected. (Kaufman, Kraay, and Mastruzzi 2005, p. 131)

A higher value of the *Rule of Law* index indicates a country with a higher level of rule of law. In addition, Kaufman, Kraay, and Mastruzzi say that the *Control of Corruption* index

> measures perceptions of corruption, conventionally defined as the exercise of public power for private gain. Despite this straightforward focus, the particular aspect of corruption measured by the various sources differs somewhat, ranging from the frequency of "additional payments to get things done," to the effects of corruption on the business environment, to measuring "grand corruption" in the political arena or in the tendency of elite forms to engage in "state capture". The presence of corruption is often a manifestation of a lack of respect of both the corrupter (typically a private citizen or firm) and the corrupted (typically a public official or politician) for the rules which govern their interactions, and hence represents a failure of governance according to our definition. (Kaufman, Kraay, and Mastruzzi 2005, p. 131)

A higher value of the *Control of Corruption* index indicates a country with better control over corruption, and thus less corruption. Table 1 describes the distributions of the two indices across countries. Since the standard deviation of each of the indices is 1, the interval values of 0.5 in Table 1 represent one-half of a standard deviation in our indices.

To assess the effects of religion and other variables on the rule of law and on corruption, we gathered a variety of data from several sources. From the CIA's *World Factbook 2003*, we obtained data on GDP per capita in constant PPP dollars as well as other variables likely to affect countries' development levels; ultimately, GDP per capita was sufficiently explanatory that other variables were not helpful in the regressions we report below.[3] Indeed, the simple correlation is 0.82 between ln(*GDP per Capita*) and both the *Rule of Law* and the *Control of Corruption* indices, which means that the R^2 of a simple OLS regression of each index on ln(*GDP per Capita*) is 0.67.

3. Other data that we obtained but do not include in our reported regressions are adult literacy rate, population and population density, land area, median age of population, life expectancy, size of labor force, and Gini coefficients. When these variables are included in our regressions, there are some minor substantive differences from the results we report here. However, these variations could be attributable to the impact of the variables themselves, changes in the sample due to missing data, multicollinearity problems, inconsistent estimates resulting from endogeneity between ln(*GDP per Capita*) and other development measures, or other factors. As a result, we conclude that a parsimonious specification that includes ln(*GDP per Capita*) as the primary development measure is the preferred option for our purposes. We also obtained data on military spending as a percentage of GDP, which had a significantly positive (but small) effect on both *Rule of Law* and *Control of Corruption* but had no qualitative effect on the religious variables of interest in this paper. Complete results with military spending are available in the online appendix.

TABLE 2

DISTRIBUTION OF COUNTRIES BY LARGEST RELIGIOUS GROUP

	1900		2000	
Largest religious group	Number of countries	Mean GDP per capita	Number of countries	Mean GDP per capita
African ethnoreligion	36	$2,067	7	$1,129
Asian ethnoreligion	8	15,088	5	19,400
Buddhist	8	6,025	8	6,025
Catholic	53	13,030	71	11,514
Hindu	4	4,800	4	4,925
Islam	41	6,091	49	5,088
Jewish	0		1	19,700
Orthodox	13	7,223	14	6,371
Pacific Island ethnoreligion	6	2,583	0	
Protestant	38	16,545	44	12,961
Unaffiliated Christian	0		1	3,800
Nonreligious	0		3	6,100
Total	207		207	

NOTES: This table shows the distribution of countries by the identity of each country's largest religious group in 1900 and in 2000. For both years of data, country borders are those existing in 2000. Data on largest religion are from Barrett, Kurian, and Johnson (2001) using the categories specified therein, except that data for Hong Kong and Macao are from Barrett (1982). Mean GDP per capita is in constant PPP dollars circa 2001.

To assess the religious culture of each of the 207 countries present in the GRICS data, we gathered data from Barrett, Kurian, and Johnson (2001) on each country's largest religious group in the years 1900 and 2000. We used Barrett, Kurian, and Johnson's classification of religions, which includes 23 different religious groups, to create a vector of dummy variables representing every religious group that is the largest group in at least one country.[4] As shown in Table 2, there were 11 religious groups that were the largest group in at least one country in 2000, and 9 religious groups that were the largest group in at least one country in 1900. For each country in both 1900 and 2000, we coded the largest religious group's dummy variable as 1, and we coded all other religious groups' dummy variables as 0 for that country-year. The distributions of countries by largest religious group and year are reported in Table 2.

4. Barrett, Kurian, and Johnson (2001) provide data for 1900 and 2000 on a country-by-country basis. They use present borders to determine past statistics, so that we are comparing identical geographic areas across years even when the country did not exist in its current form in 1900. The full set of religious groups used by Barrett, Kurian, and Johnson is: Roman Catholics, Protestants, Orthodox, Anglicans, Marginal Christians, Independent Christians, Unaffiliated Christians, Muslims, Hindus, Chinese Folk Religionists, Buddhists, Ethnoreligionists, New Religionists, Sikhs, Jews, Spiritists, Baha'is, Confucianists, Jains, Shintos, Taoists, Zoroastrians, and Other Religionists. Of course, several of these are never the largest religious group in any country. Barrett, Kurian, and Johnson define "Independent Christians" as those who are "separated from, uninterested in, and independent of historic denominational Christianity." Examples of large "Independent" groups within the United States are the Baptist Bible Fellowship International; the Churches of Christ; the Fullness/Praise Network; and black denominations like the African Methodist Episcopal Church, the Pentecostal Assemblies of the World, the two National Baptist Conventions, the Progressive National Baptist Convention, and the National Primitive Baptist Convention. Because groups like this arise out of Protestantism and are generally viewed as Protestants—as are Anglicans—we combined Protestants, Independent Christians, and Anglicans into a single category of "Protestant" for our purpose of determining which religious group was largest in each country.

Note that there are four religious groups that were largest in at least 10 countries in both years: Catholicism, Islam, Protestantism, and Orthodox Christianity. The other religious groups that are largest in at least one country are African ethnoreligions,[5] Asian ethnoreligions (including Chinese folk religion),[6] Buddhism, Hinduism, Judaism, Pacific Island ethnoreligions, "Unaffiliated Christians,"[7] and nonreligion. The classification of every country in the data set for both 1900 and 2000 is set forth in the online appendix.

Looking at Table 2, the most marked trend between 1900 and 2000 is the significant decline in the number of countries dominated by the various ethnoreligions, especially in Africa and the Pacific Islands. Two Asian countries shifted from ethnoreligions in 1900 to other religious groups in 2000, one to nonreligion (North Korea) and one to Protestantism (South Korea). In Africa, 11 countries moved from ethnoreligion to Protestantism, 10 countries to Catholicism, 7 countries to Islam, and 1 to Orthodox. In the Pacific Islands, the 6 countries dominated by ethnoreligion in 1900 moved by 2000 to Protestantism (Nauru, Papua New Guinea, Solomon Islands, Vanuatu), Catholicism (East Timor), and Islam (Indonesia). No country moved from some other group to ethnoreligion between 1900 and 2000.

One concern in using the Barrett, Kurian, and Johnson (2001) classification of religious groups is that this classification breaks only Christianity into subgroups while making no similar distinction within other religious traditions. This allows us to divide the Christian countries (129 in 2000 and 104 in 1900) into three groups, but unfortunately does not allow us to examine the distinction in Islam between Sunni and Shia.

Summary statistics for our independent variables are set forth in Table 3. Our empirical strategy is straightforward. We estimate various linear regressions of the *Rule of Law* index and of the *Control of Corruption* index on a set of variables, including the religion variables for both 2000 and 1900. We then perform pairwise hypothesis tests on the coefficient estimates for each religion variable to see whether they are statistically different from each other. The results of this analysis are discussed in the next section.

5. Barrett, Kurian, and Johnson (2001) define an ethnoreligion as "a non-Christian or pre-Christian religion tied closely to a specific ethnic group, with membership restricted to that group; usually animists, polytheists, or shamanists." We coded ethnoreligions separately by region in recognition of differences in such religions across regions of the world.

6. We combine Asian ethnoreligions and Chinese folk religion into a single category. Barrett, Kurian, and Johnson (2001) describe "Chinese folk religion" as "a complex amalgam of 6 elements: ancestor veneration, which is accorded a place in Confucian tradition; Confucian ethics; devotion to local divinities and deified heroes, some of which are Taoist; Chinese universism; some Buddhist elements; and a whole series of practices related to fortune-telling, divination, magic, and sorcery."

7. Barrett, Kurian, and Johnson (2001) define "Unaffiliated Christians" as "persons professing allegiance and commitment to Christ but who have no church affiliation." In 2000, Unaffiliated Christians were the largest religious group in Jamaica.

TABLE 3

SUMMARY STATISTICS FOR INDEPENDENT VARIABLES

Variable	Mean	SD	Min	Max
GDP per capita (thousand U.S. dollars)	9.376	10.106	0.5	55.1
Largest religious group in 1900				
African Ethnoreligion	0.174	0.380	0	1
Asian ethnoreligion	0.039	0.120	0	1
Buddhist	0.039	0.193	0	1
Catholic	0.256	0.438	0	1
Hindu	0.019	0.138	0	1
Islam	0.198	0.400	0	1
Orthodox	0.063	0.243	0	1
Pacific Island Ethnoreligion	0.029	0.168	0	1
Protestant	0.184	0.388	0	1
Largest religious group in 2000				
African Ethnoreligion	0.034	0.181	0	1
Asian ethnoreligion	0.024	0.154	0	1
Buddhist	0.039	0.193	0	1
Catholic	0.343	0.476	0	1
Hindu	0.019	0.138	0	1
Islam	0.237	0.426	0	1
Jewish	0.005	0.070	0	1
Orthodox	0.068	0.252	0	1
Protestant	0.213	0.410	0	1
Unaffiliated christian	0.005	0.070	0	1
Nonreligious	0.014	0.120	0	1
Location by continent				
Asia	0.246	0.432	0	1
Africa	0.261	0.440	0	1
Europe	0.208	0.407	0	1
North America	0.010	0.098	0	1
Central America and Caribbean	0.135	0.343	0	1
South America	0.063	0.243	0	1
Australia and Pacific Islands	0.092	0.289	0	1
Instrumental variables for GDP per capita				
Latitude (in degrees)	24.6	16.6	0	65
Northern Hemisphere	.797	.403	0	1
Landlocked	.193	.396	0	1
Arable land percentage	18.7	15.8	0	66.67

NOTE: $n = 207$.

2. RESULTS

2.1 Largest Religious Group

Before reporting the results of any regressions, we set forth in Table 4 the means and standard deviations of *Rule of Law* and *Control of Corruption* according to each country's largest religious group in both 2000 and 1900. The Asian ethnoreligion countries[8] had the highest mean values for both indices based on the 2000 classification, while the Protestant countries had the highest mean values for both indices

8. We adopt this admittedly loose terminology for the sake of convenience. What makes a country "Protestant" or "Catholic" or "Islamic" or "Asian ethnoreligion" is obviously a matter of perception and definition. Here, we simply use the terms to refer to the largest religious group in the country in a particular year.

TABLE 4

DEPENDENT VARIABLE MEANS BY LARGEST RELIGIOUS GROUP

	Rule of Law index		*Control of Corruption* index	
Largest religious group (year)	2000	1900	2000	1900
African ethnoreligion	− 0.974	− 0.808	− 0.683	− 0.692
	(0.540)	(0.585)	(0.318)	(0.509)
Asian ethnoreligion	1.148	0.599	1.158	0.499
	(0.648)	(1.028)	(1.130)	(1.322)
Buddhist	− 0.360	− 0.360	− 0.360	− 0.360
	(0.965)	(0.965)	(0.924)	(0.924)
Catholic	0.185	0.318	0.217	0.337
	(0.962)	(0.868)	(0.960)	(0.865)
Hindu	− 0.138	− 0.080	− 0.235	− 0.058
	(0.717)	(0.689)	(0.399)	(0.481)
Islam	− 0.578	− 0.495	− 0.520	− 0.438
	(0.759)	(0.829)	(0.668)	(0.737)
Jewish	0.770		0.790	
Orthodox	− 0.458	− 0.415	− 0.446	− 0.407
	(0.627)	(0.632)	(0.545)	(0.551)
Pacific Island ethnoreligion		− 0.463		− 0.770
		(0.706)		(0.365)
Protestant	0.576	1.001	0.460	0.885
	(1.004)	(0.744)	(1.192)	(1.084)
Unaffiliated Christian	− 0.320		− 0.520	
Nonreligious	− 0.237		− 0.383	
	(1.050)		(1.145)	
All countries	− 0.005	− 0.005	− 0.006	− 0.006
	1.000	1.000	0.999	0.999

NOTES: Means by group are reported; standard deviations are in parentheses. Omitted standard deviations reflect groups that are largest in only one country, as reported in Table 2.

under the 1900 classification. Countries having positive mean values for both indices are those that were Asian ethnoreligion, Protestant, Catholic, and Jewish (which is the largest religious group in Israel in 2000). The effect of the conversion of many African and Pacific ethnoreligious countries between 1900 and 2000 is reflected by the decline in the means of countries that were Protestant or Catholic in 2000 from the set that were Protestant or Catholic in 1900. In addition, countries dominated in either year by African ethnoreligion, Buddhism, Hinduism, Islam, Orthodox Christianity, Pacific Island ethnoreligion, and nonreligion have negative mean values of both indices. The differences in means are large—the difference between the highest and lowest group means (for either year's classification) is about two standard deviations for *Rule of Law* and one-and-a-half standard deviations for *Control of Corruption*. While these mean comparisons are suggestive, there are likely to be additional variables that can explain the unconditional differences in means shown in Table 4.

The most obvious additional factor that might affect *Rule of Law* or *Control of Corruption* is the country's level of development. We used ln(*GDP per Capita*) as a proxy for each country's level of development. Other variables could also be used, such as median age, infant mortality, life expectancy, and so forth, but all

TABLE 5
REGRESSION RESULTS

	Rule of Law		*Control of Corruption*	
Variable	1900	2000	1900	2000
ln(*GDP per Capita*)	0.510**	0.626**	0.660**	0.748**
	(0.000)	(0.000)	(0.000)	(0.000)
Largest religious group				
African ethnoreligion	0.025	−0.126	0.170	0.242
	(0.928)	(0.683)	(0.546)	(0.416)
Asian ethnoreligion	0.631	0.579*	0.535	0.521
	(0.143)	(0.011)	(0.353)	(0.084)
Buddhist	0.265	0.025	0.221	0.092
	(0.467)	(0.941)	(0.561)	(0.806)
Catholic	0.606**	−0.015	0.450*	0.019
	(0.002)	(0.917)	(0.028)	(0.911)
Hindu	0.533*	0.104	0.462	−0.021
	(0.031)	(0.583)	(0.160)	(0.943)
Islam	0.116	−0.095	0.157	0.061
	(0.591)	(0.530)	(0.459)	(0.714)
Nonreligious		0.029		0.018
		(0.910)		(0.946)
Orthodox		−0.253		−0.119
		(0.231)		(0.593)
Pacific Island religion	0.011		0.163	
	(0.978)		(0.695)	
Protestant	0.914**	0.010	0.713**	−0.039
	(0.000)	(0.953)	(0.003)	(0.838)
Constant	−4.497**	−4.777**	−5.453**	−5.662**
	(0.000)	(0.000)	(0.000)	(0.000)
F-statistic	130.5**	123.3**	34.4**	29.9**
	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.816	0.794	0.796	0.773
Number of observations	207	207	203	203

NOTES: $n = 207$. The dependent variable in columns 1 and 2 is *Rule of Law* in 2004, and the dependent variable in columns 3 and 4 is *Control of Corruption* in 2004. We report coefficient estimates from instrumental variables regressions using *Latitude,* a *Northern Hemisphere* dummy, a *Landlocked* dummy, and *Arable Land Percentage* as instruments for the first-stage ln(*GDP per Capita*) regression. All regressions include dummy variables for continental location and colonial/territorial history. Numbers in parentheses are robust *p*-values. Additional results are reported in the online appendix.
*$p < 0.05$.
**$p < 0.01$.

such variables were highly correlated with GDP per capita, provided little additional explanatory power, and usually resulted in a loss of observations due to missing data.

Table 5 reports our main regression results for *Rule of Law* and *Control of Corruption*. The first column of Table 5 reports the results of a regression of *Rule of Law* in 2004 on ln(*GDP per Capita*) and dummy variables for each country's largest religion in 1900. The second column is identical, except that the religion variables are based on the largest religion in 2000. Columns 3 and 4 repeat this analysis with *Control of Corruption* in 2004 as the dependent variable. All four regressions include additional controls for geographical and historical factors: a vector of dummy variables for the continent on which the country is located, and a vector of dummy variables indicating whether the country has been a colony or territory of another country since

1800.[9] Our coding of continental locations and colonial/territorial variables is available in online appendix.

In using ln(*GDP per Capita*) to control for the level of development, there is an important statistical concern with merely estimating OLS regressions: *GDP per Capita* and *Rule of Law* are likely endogenously codetermined. (A similar problem exists for *Control of Corruption*.) That is, *GDP per Capita* should be higher where there is stronger rule of law (as much existing literature suggests), but it should also be that higher *GDP per Capita* makes law enforcement relatively less expensive and compliance with the law relatively more beneficial. Such endogeneity renders any OLS estimates inconsistent. To deal with this endogeneity, we used IV regression, using the following instruments in the first-stage regression of ln(*GDP per Capita*): *Latitude in Degrees* of the country's geographic center, a dummy variable equal to 1 when the country's geographic center is in the *Northern Hemisphere*, a dummy variable equal to 1 if the country is *Landlocked*, and the percentage of the country's land that is arable.[10] A simple OLS regression of ln(*GDP per Capita*) on these four variables yields an R^2 of .37 and an F-statistic of 29.84 (p-value = .000), indicating that these (at least plausibly) exogenous instruments provide a reliable prediction of ln(*GDP per Capita*).

In Table 5, ln(*GDP per Capita*) is highly correlated with *Rule of Law*, with coefficient estimates around 0.5 to 0.6 and p-values of .000. As mentioned above, regressing *Rule of Law* on only ln(*GDP per Capita*) and a constant yields a very high R^2 of 0.67, so much of the explanatory power of these regressions comes from ln(*GDP per Capita*). This result is consistent with prior literature emphasizing the connection between wealth and the rule of law.

With regard to the religion variables in Table 5, only a handful are statistically significant. In the first column of Table 5 based on religious classification in 1900, the excluded group of countries is the Orthodox countries; in the second column based on the 2000 religion classification, the excluded countries are Israel, the only Jewish country, and Jamaica, the only unaffiliated Christian country.[11] As a general

9. We only treated a country as a former colony or territory of another country if the relationship existed in the 19th or 20th centuries. Thus, the United States is not treated as a colony or territory of any other country, and Canada is coded as a former British colony but not a former French colony. Similarly, we ignored 16th century Portuguese settlements in India and so on. (This is similar to Mauro (1995), who based colonial status on years after 1776. Mauro stated that he was following Taylor and Hudson (1972)). Finally, we did not treat temporary military occupations as colonial or territorial relationships; thus, U.S. occupation of Japan and Germany after World War II were not treated as making those countries U.S. territories.

10. Latitude and landlocked status have frequently been used in other research as instruments for measures of economic development, e.g., La Porta et al. (1999), McArthur and Sachs (2001), Al-Marhubi (2004). We view arable land percentage as a proxy for potential agricultural productivity. While not used often in the extant literature, Harrison (1996) included the amount of arable land as an independent variable in growth regressions.

11. Because there is only one Jewish country (Israel) and one Unaffiliated Christian country (Jamaica), robust standard error estimates are unreliable if we include either variable. Thus, we excluded both variables in conducting the IV regressions in columns 2 and 4 of Table 5. We are not concerned about lumping these groups together because the focus of our analysis is the pairwise comparisons of coefficient estimates in Tables 6 and 7. However, by excluding Judaism and Unaffiliated Christians from the regressions, we are not able to make any inferences about these two religious groups.

TABLE 6

PAIRWISE TESTS OF EFFECTS OF RELIGION VARIABLES ON RULE OF LAW

Panel A. Largest religious group in 1900

	β_2							
	Protestant	Asian	Catholic	Hindu	Buddhist	Islam	African	Pacific
β_1								
Asian	0.52	—						
Catholic	7.72**	0.00	—					
Hindu	2.17	0.06	0.10	—				
Buddhist	2.86	0.62	0.90	0.95	—			
Islam	11.98**	1.88	5.33*	7.08**	0.26	—		
African	8.86**	2.00	4.24*	6.82**	0.52	0.26	—	
Pacific	5.83*	1.37	2.65	2.10	0.36	0.08	0.00	—
Orthodox	17.22**	2.16	9.61**	4.75*	0.53	0.29	0.01	0.00

Panel B. Largest religious group in 2000

	β_2							
	Asian	Hindu	Nonreligious	Buddhist	Protestant	Catholic	Islam	African
β_1								
Hindu	3.52	—						
Nonreligious	3.30	0.10	—					
Buddhist	2.36	0.08	0.00	—				
Protestant	6.42*	0.20	0.01	0.00	—			
Catholic	7.22**	0.46	0.04	0.02	0.04	—		
Islam	8.57**	2.18	0.30	0.19	0.29	0.25	—	
African	4.21*	0.63	0.21	0.16	0.19	0.15	0.01	—
Orthodox	7.71**	2.59	1.08	0.69	1.12	1.27	0.65	0.15

NOTES: These tables report the results of pairwise testing of the hypothesis that $\beta_2 - \beta_1 = 0$, where β_1 is the coefficient on the variable in the left-hand column and β_2 is the coefficient on the variable in the top row. The number reported is the *F*-statistic. The coefficient estimates used in Panel A are from column 1 of Table 5; the coefficient estimates used in Panel B are from column 2 of Table 5. The variables are sorted from the highest-valued point estimate to the lowest, so that the estimated value of $\beta_2 - \beta_1 > 0$ in all cells. However, the *F*-tests are two-tailed tests.
*$p < 0.05$.
**$p < 0.01$.

summary of the results in these two tables, a country's largest religion in 1900 is a statistically significant determinant of the country's *Rule of Law* (relative to the Orthodox countries) for the Protestant, Catholic, and Hindu countries. In contrast, a country's largest religious group in 2000 was only a significant determinant of *Rule of Law* (compared to the two excluded countries) for Asian ethnoreligion countries.

Ultimately, though, our question is how the different religious groups vary in their effects on *Rule of Law* and *Control of Corruption*. To analyze this question more thoroughly, we conducted a series of pairwise tests of the significance of differences in each pair of coefficient estimates. The results of these tests for *Rule of Law* are reported in Table 6. In each cell of Table 6, we report the *F*-statistic that tests the hypothesis that $\beta_1 = \beta_2$, where β_1 is the coefficient on the religion variable identified in the left-hand column of Table 6 and β_2 is the coefficient on the

religion variable identified along the top row.[12] The religion variables are sorted in order of the value of the point estimates on their coefficients, from highest to lowest, using the IV estimates in the first two columns of Table 5. Thus, for every cell, the estimated value of $\beta_2 - \beta_1$ is positive (we conduct two-tailed hypothesis tests, though).

Panel A of Table 6 sets forth the results of the difference tests for the 1900 religion classification, and Panel B sets forth the results for the 2000 religion classification. In Panel A, the countries that were Protestant in 1900 had significantly higher *Rule of Law* values in 2004 than did countries that were Catholic, Islamic, African ethnoreligion, Pacific Island ethnoreligion, and Orthodox in 1900. Similarly, countries that were Catholic or Hindu in 1900 were significantly higher in *Rule of Law* than the Islamic, African ethnoreligion, and Orthodox countries. The gap between Protestant countries (the highest *Rule of Law*) and Orthodox countries (the lowest) was 0.9 standard deviation of the *Rule of Law* index.

In Panel B, countries that were Asian ethnoreligion in 2000 had significantly higher levels of *Rule of Law* in 2004 than most of the other religious groups, and the other religions' coefficient estimates were not significantly different from each other. The point estimates imply that Asian ethnoreligion countries were 0.8 standard deviation higher in *Rule of Law* than Orthodox countries, which had the lowest *Rule of Law* after controlling for GDP per capita.

In Table 7, we report an analogous pairwise analysis of how different religions affect the *Control of Corruption* index, using the coefficients in columns 3 and 4 of Table 5. The *Control of Corruption* results were similar to the *Rule of Law* results, though there were fewer significant differences and the magnitudes of the effects were slightly smaller. For the 1900 religious classification, Protestant countries had significantly higher *Control of Corruption* than Catholic, Islamic, and Orthodox countries. Also, Catholic countries had significantly higher *Control of Corruption* than Orthodox countries. When we used the 2000 religious classification, Asian ethnoreligion countries had a significantly higher positive effect on *Control of Corruption* than did Protestant countries. Otherwise, as with *Rule of Law*, there were no significant (at the .05 level) differences across the religious groups under the 2000 classification.

What are the implications of these findings? In all, they suggest that countries whose largest religious group in 1900 was Protestantism have higher current levels of rule of law and lower current corruption than other countries. Countries whose largest religious group in 1900 was Catholicism or Hinduism have a higher rule of law than the Islamic, African ethnoreligion, or Orthodox countries, and countries that were Catholic in 1900 exhibit less corruption than the Orthodox countries. Finally, the countries that were Asian ethnoreligion in 2000 show higher rule of law than most

12. Each test is thus an F-test with (1,174) degrees of freedom. For the comparisons with Orthodox in Panel A (which was the excluded religious group in Table 5), we simply square the t-statistic of the religion variable from the first column of Table 5, since the value of an F-statistic with (1, n) degrees of freedom is the square of the corresponding t-statistic with n degrees of freedom. See Greene (1997, pp. 69–70) for discussion of the relationship between the t and the F distributions.

TABLE 7

PAIRWISE TESTS OF EFFECTS OF RELIGION VARIABLES ON THE CONTROL OF CORRUPTION INDEX

Panel A. Largest religious group in 1900

	β_2							
	Protestant	Asian	Hindu	Catholic	Buddhist	African	Pacific	Islam
β_1								
Asian	0.11	—						
Hindu	0.51	0.02	—					
Catholic	4.54*	0.02	0.00	—				
Buddhist	1.48	0.26	0.48	0.36	—			
African	3.01	0.39	1.03	0.89	0.02	—		
Pacific	2.08	0.31	0.46	0.54	0.02	0.00	—	
Islam	5.05*	0.49	1.44	1.74	0.04	0.01	0.00	—
Orthodox	8.88**	0.86	1.99	4.88*	0.34	0.37	0.15	0.55

Panel B. Largest religious group in 2000

	β_2							
	Asian	African	Buddhist	Islam	Nonreligious	Catholic	Hindu	Protestant
β_1								
African	0.62	—						
Buddhist	1.00	0.16	—					
Islam	2.45	0.57	0.01	—				
Nonreligious	2.08	0.54	0.04	0.04	—			
Catholic	3.34	0.75	0.04	0.07	0.00	—		
Hindu	2.04	0.62	0.09	0.11	0.01	0.02	—	
Protestant	3.97*	1.13	0.12	0.33	0.05	0.18	0.00	—
Orthodox	3.29	1.46	0.32	0.81	0.26	0.38	0.10	0.10

NOTES: These tables report the results of pairwise testing of the hypothesis that $\beta_2 - \beta_1 = 0$, where β_1 is the coefficient on the variable in the left-hand column and β_2 is the coefficient on the variable in the top row. The number reported is the *F*-statistic. The coefficient estimates used in Panel A are from column 3 of Table 5; the coefficient estimates used in Panel B are from column 4 of Table 5. The variables are sorted from the highest-valued point estimate to the lowest, so that the estimated value of $\beta_2 - \beta_1 > 0$ in all cells. However, the *F*-tests are two-tailed tests.
*$p < 0.05$.
**$p < 0.01$.

other religious groups and less corruption than Catholic, Protestant, or Orthodox countries.

Consistent with Putnam (1993), we conclude from this evidence that a country's religious heritage matters in determining both *Rule of Law* and *Control of Corruption*, but that this effect is felt over the course of centuries rather than decades. For most countries, the largest religious group in 1900 had likely been the largest for at least several centuries, but by 2000 many African and Pacific Island nations had undergone conversion from ethnoreligions to Protestantism, Catholicism, or Islam. As a result, our study suggests that countries with a Protestant, Catholic, or Hindu heritage currently show higher levels of *Rule of Law* and *Control of Corruption*, but a country must generally have had one of these as its largest religious group for more than a century in order for the effects to be statistically significant.

2.2 *Robustness Checks*

To examine how much our decision to identify countries based only on their largest religious groups drives our results, we conducted a number of robustness checks. These included specifications controlling for the effects of majority and supermajority religions in 1900 and 2000, religious population shares in 1900 and 2000, communist/authoritarian governments in the 20th century, military spending, religious and ethnolinguistic fractionalization, the extent of primary schooling in 1930, and other variables found relevant in prior literature. These analyses are presented in the online appendix, though we note two key findings here.

First, the positive effects of Asian ethnoreligions in 2000 reported in Tables 6 and 7 did not hold up when we controlled for religion shares in each country, or when we used dummy variables for majority and supermajority religions. Thus, our most robust findings were that the countries that were Protestant, Catholic, or Hindu in 1900 had the strongest current *Rule of Law*, and the countries that were Protestant in 1900 had the lowest current corruption. These findings suggest that researchers examining religion's effect on economic growth should focus on historical religious affiliations, such as our data for 1900, rather than current religious affiliations.

Second, in some instances, we found different results when controlling for variables in which observations were missing for some countries in our data set. This occurred when we controlled for *Primary School Enrollment in 1930* and when we embedded our religion measures into regressions similar to those of Barro and McCleary (2003), La Porta et al. (1999), and Treisman (2000). However, our results were similar to those reported above when we controlled for military spending and communist/authoritarian governments. We concluded that the differing results were due to changes in sample composition, not due to the influence of the new control variable. We demonstrate here how we reached this conclusion regarding *Primary School Enrollment in 1930*.

Recent papers by Becker and Woessmann (2009, 2008) suggest that the positive correlations between Protestantism and economic growth might be caused by the higher human capital resulting from Protestantism's increased emphasis on literacy and Bible reading. To check whether this potential avenue of causation was driving our results, we used data on *Primary School Enrollment in 1930*, taken from Benavot and Riddle (1988). (Gallego 2010 also recently used these data on historical primary schooling rates.) By using historical education rates, we avoided the problem of endogeneity between current educational attainment, current GDP per capita, and current governance quality.

We repeated our regression analyses for *Rule of Law* and *Control of Corruption* with *Primary School Enrollment in 1930* as a control variable. The results for our largest-religion variables in 2000 were not different from Tables 6 and 7 in any meaningful way. However, the results for largest-religion in 1900 were quite different; the pairwise coefficient comparisons are presented in Tables 8 and 9. By comparing Panel A of Table 6 to Panel A of Table 8, it is apparent that including *Primary Enrollment in 1930* altered both the ordering of the various largest-religion coefficient estimates and

TABLE 8

PAIRWISE TESTS OF EFFECTS OF LARGEST RELIGION IN 1900 ON RULE OF LAW, WITH AND WITHOUT CONTROLS FOR PRIMARY ENROLLMENT IN 1930

Panel A. Controlling for primary enrollment in 1930

	β_2						
	Hindu	African	Asian	Protestant	Buddhist	Islam	Catholic
β_1							
African	0.37	—					
Asian	2.61	0.19	—				
Protestant	2.55	0.24	0.03	—			
Buddhist	5.60*	0.97	0.32	0.07	—		
Islam	8.39**	1.22	0.60	0.26	0.04	—	
Catholic	5.95*	0.81	0.63	2.07	0.08	0.02	—
Orthodox	12.25**	3.65	2.96	3.46	2.07	3.28	1.82

Panel B. No control for primary enrollment, same sample

	β_2						
	Hindu	African	Protestant	Asian	Buddhist	Catholic	Islam
β_1							
African	0.05	—					
Protestant	0.84	0.17	—				
Asian	4.01*	1.23	0.27	—			
Buddhist	3.85	1.49	0.25	0.00	—		
Catholic	3.12	0.80	3.32	0.02	0.01	—	
Islam	6.03*	2.21	0.68	0.15	0.11	0.03	—
Orthodox	7.73**	2.89	2.73	1.21	1.02	1.12	1.23

NOTES: These tables report the results of pairwise testing of the hypothesis that $\beta_2 - \beta_1 = 0$, where β_1 is the coefficient on the variable in the left-hand column and β_2 is the coefficient on the variable in the top row. The number reported is the *F*-statistic. The dependent variable is *Rule of Law*. The coefficient estimates used in each panel are from unreported regressions (available in the online appendix) on a sample of 141 countries for which *Primary School Enrollment in 1930* is available. In Panel A, *Primary Schooling* was included in the regression; in Panel B, it was not. The variables are sorted from the highest-valued point estimate to the lowest, so that the estimated value of $\beta_2 - \beta_1 > 0$ in all cells. However, the *F*-tests are two-tailed tests.
*$p < 0.05$.
**$p < 0.01$.

the relative significance of them. Most notably, the significance of the estimates for Protestant and Catholic countries mostly disappeared, Hindu countries had the highest *Rule of Law*, and African ethnoreligion countries had (insignificantly) higher *Rule of Law* than most other groups. Similar results emerged for *Control of Corruption*, as can be seen by comparing Panel A of Table 7 with Panel A of Table 9.

To determine whether these changes in the relative effects and significance of the largest-religion variables were attributable to the inclusion of *Primary School Enrollment in 1930* or to the associated change in the sample composition, we estimated the regressions again on the smaller sample but excluded *Primary School Enrollment*. The resulting pairwise comparisons of coefficient estimates are presented in Panel B of Tables 8 and 9. A comparison of Panel A to Panel B in Tables 8 and 9 shows very similar patterns of both magnitude and significance for the largest-religion variables, regardless of whether we control for *Primary School Enrollment*. Thus, the most likely reason for the change in results (compared to Tables 6 and 7)

TABLE 9

PAIRWISE TESTS OF EFFECTS OF LARGEST RELIGION IN 1900 ON CONTROL OF CORRUPTION, WITH AND WITHOUT CONTROLS FOR PRIMARY ENROLLMENT IN 1930

Panel A. Controlling for primary enrollment in 1930

	β_2						
	African	Hindu	Protestant	Islam	Buddhist	Asian	Catholic
β_1							
Hindu	0.13	—					
Protestant	0.93	0.64	—				
Islam	2.40	1.26	0.07	—			
Buddhist	2.65	1.32	0.07	0.00	—		
Asian	1.58	1.26	0.09	0.01	0.01	—	
Catholic	2.32	2.25	2.94	0.51	0.32	0.19	—
Orthodox	4.88*	3.28	2.04	2.40	1.25	0.64	0.37

Panel B. No control for primary enrollment in 1930, same sample

	β_2						
	African	Hindu	Protestant	Islam	Buddhist	Asian	Catholic
β_1							
Hindu	0.14	—					
Protestant	0.51	0.27	—				
Islam	3.05	1.25	0.30	—			
Buddhist	3.22	1.39	0.30	0.00	—		
Asian	2.66	1.50	0.42	0.05	0.04	—	
Catholic	1.87	1.56	3.95*	0.13	0.08	0.01	—
Orthodox	4.12*	2.99	2.40	1.77	0.85	0.41	0.53

NOTES: These tables report the results of pairwise testing of the hypothesis that $\beta_2 - \beta_1 = 0$, where β_1 is the coefficient on the variable in the left-hand column and β_2 is the coefficient on the variable in the top row. The number reported is the *F*-statistic. The dependent variable is *Control of Corruption*. The coefficient estimates used in each panel are from unreported regressions (available in the online appendix) on a sample of 141 countries for which *Primary School Enrollment in 1930* is available. In Panel A, *Primary School Enrollment* was included in the regression; in Panel B, it was not. The variables are sorted from the highest-valued point estimate to the lowest, so that the estimated value of $\beta_2 - \beta_1 > 0$ in all cells. However, the *F*-tests are two-tailed tests.
*$p < 0.05$.

is the change in the composition of the sample, not the inclusion of *Primary School Enrollment*. While the largest-religion variables may be picking up some indirect effect of educational attainment, we would need more complete data on historical primary schooling to detect it.

These results point to the importance of preserving as many observations as possible when conducting cross-country regressions. Because we only had *Primary School Enrollment* data for 142 countries, including this variable in our analysis knocked over 60 countries (more than 30% of the observations) out of the sample. Moreover, there is no reason to believe that the *Primary School Enrollment* data were randomly missing, so that controlling for *Primary School Enrollment* likely introduced other types of bias into the analysis that could only be solved with better (but unavailable) data.

We have therefore chosen to base our core analysis on specifications that preserve as many observations as possible, risking omitted variable bias in order to avoid

sample composition bias. Our results in this instance also raise the possibility that disagreements in the literature on the effects of certain variables in cross-country regressions may have arisen due to variations in sample composition rather than real effects of the variables in question.

3. CONCLUSION

We analyze the statistical relationship between a country's largest religious group in 2 years (1900 and 2000) and its level of rule of law and corruption in 2004. We find that *Rule of Law* in 2004 was strongest in countries whose largest religious group in 1900 was Protestant, Catholic, or Hindu, and in countries whose largest religion in 2000 was an Asian ethnoreligion. Similarly, corruption in 2004 was lowest in the countries that were Protestant in 1900 and highest in the countries that were Orthodox Christian in 1900. The results based on the largest religious group in 1900 are generally robust to a variety of alternative specifications, but those for largest religious group in 2000 are not. Overall, our analysis suggests that there may be important differences in how a country's largest religion affects its economic growth.

One possible explanation for our results is that the *Rule of Law* and *Control of Corruption* indices simply reflect a pro-Western bias in governance measures. Thus, once we control for GDP per capita, we may only be finding that Westerners responding to surveys dislike the economic conditions in Muslim countries, in transitioning Eastern European countries, and in Africa. While we cannot completely reject this possibility, Kaufman, Kraay, and Mastruzzi (2005) work to avoid this problem by using a wide array of sources and types of data in constructing the indices. As a result, the dependent variables used above are as close to an objective assessment of rule of law and corruption as is possible in light of available data and the nature of the concepts being measured.

In addition, our results raise an issue that merits more discussion in the future: is the state of religion in 1900 or 2000 a better measure of a country's current religious/cultural heritage? The studies cited in Section 1 mostly focus on contemporary religious measures to explain rule of law, corruption, or economic growth. Our results strongly suggest that religious status in 1900 more accurately characterizes the long-standing religious heritage of a nation, because many nations saw important changes during the 20th century. Evidence presented above suggests that the effects of various religious groups are very different depending on whether we use religious status in 1900 or 2000, with Africa and the Pacific Islands being the main source of variation. We obtained a number of statistically significant results using religious status in 1900, but very few based on religious status in 2000. The results for 1900 religious status show that religion is correlated with corruption and the rule of law. However, religion's potentially causal effects on these variables would only be felt over the very long run—periods of centuries rather than years or decades. Our results suggest that in the future, researchers seeking to examine religion and economic growth (or factors

correlated with growth) should look to historic measures of religious affiliation, not just contemporary ones.

We also found that changing the composition of countries in our sample had important effects on the estimated coefficients in our regressions. Missing data are usually not missing randomly, so that results from samples containing only a subset of countries in the world may not be generalizable to the countries outside the sample. Indeed, it is possible that many of the disagreements in the literature over the effects of religious (and other) factors on rule of law, corruption, and economic growth could be reflecting differences in sample composition rather than differences in the actual effect of the disputed variables.

Finally, our results have shown that there is a correlation between religion and two factors that affect economic growth, not that the linkage is causal. Even so, we have helped establish some stylized facts in need of further investigation. Some questions that remain are: If some religions are more conducive than others to *Rule of Law* and *Control of Corruption*, why is that? Do traits of the religions themselves foster the results we have found? Are there differences in religious doctrine, practices, or culture that lead to such results? Are there other linkages rooted in nonreligious culture but correlated with religious affiliation? Some work is already underway to address such questions, and the more promising explanations mingle the religious with other institutional, cultural, and political factors. For example, Kuran (2004) proposes several reasons why the Islamic world was not able to develop growth-inducing institutions at the same time that Western Europe was developing corporations, property rights, and limitations on state power. Similarly, North and Gwin (2010) explain how the medieval Roman Catholic Church created a body of canon law that laid a foundation in the West for modern rule of law. More research is needed to understand the interplay of historic, cultural, institutional, and religious factors in laying the foundation for modern economic growth. This paper illuminates the pathways that future research should follow.

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