Is God in the Details? A Reexamination of the Role of Religion in Economic Growth[#]

Steven N. Durlauf, Andros Kourtellos, and Chih Ming Tan

July 16, 2009

JEL Classification Codes: C59, O40, Z12

Keywords: Economic growth, Religion, Model Uncertainty

[#] We thank the National Science Foundation, University of Wisconsin Graduate School, Tufts University, as well as a grant from USAID/International Food Policy Research Institute (IFPRI) for research support. Christopher Lintz and Ioanna Stylianou provided excellent research assistance.

Abstract

Barro and McCleary (2003) is a key research contribution in the new literature exploring the macroeconomic effects of religious beliefs. This paper represents an effort to evaluate the strength of their claims. We evaluate their results in terms of replicability and robustness. While we find that their analysis meets the standard of statistical replicability, we do not find that the results are robust to changes in their baseline statistical specification. Taken together, we conclude that their analysis cannot be taken to provide useable evidence on how religion might affect aggregate outcomes.

Steven N. Durlauf
Department of Economics
University of Wisconsin
1180 Observatory Drive
Madison, WI 53706-1393
sdurlauf@ssc.wisc.edu

Andros Kourtellos
Department of Economics
University of Cyprus
P.O. Box 20537, CY-1678
Nicosia, Cyprus
andros@ucy.ac.cy

Chih Ming Tan
Department of Economics
Tufts University
8 Upper Campus Road
Medford, MA 02155
chihming.tan@tufts.edu

1. Introduction

"The good Christian should beware of mathematicians, and all those who make empty prophecies. The danger already exists that the mathematicians have made a covenant with the devil to darken the spirit and to confine man in the bonds of Hell." (St. Augustine, De Genesi ad Litteram, Book II, xviii, 37).

One of the notable recent developments in economics has been the rise of interest in the study of how religion affects aggregate economic outcomes. A key paper stimulating this new literature is Barro and McCleary (2003)[1]. Barro and McCleary provide evidence that some aspects of religious beliefs (notably belief in hell) correlate positively with economic growth while church attendance correlates negatively with growth, once one has controlled for a set of alternative growth determinants. They interpret their results to mean that all else equal countries with more efficient religious sectors – that is, religious sectors that require less church attendance input to generate a given level of religious beliefs output – will tend to grow faster. While previous studies, e.g. Fernandez, Ley and Steel (2001) and Doppelhofer, Miller, and Sala-i-Martin (2004), have identified a relationship between religious affiliations and growth in the context of a general search for growth determinants, the work by Barro and McCleary brought attention to the beliefs embodied in religious affiliations.

The finding by Barro and McCleary that religion may be important to growth is an important one as it represents a new direction in the effort to identify sources of inequality across nations that lie outside the domain of the canonical neoclassical model. Explanations of this type, including geography (Sachs (2003)), institutions (Acemoglu, Johnson, and Robinson (2001, 2002), Acemoglu and Johnson (2005)) and ethnic heterogeneity (Easterly and Levine (1997) and Alesina et al (2003)), have proven very valuable in understanding cross-country differences. To the extent that religion proves similarly useful, it may well represent the beginning of a major new research direction.

[1] Other work in this area includes Cavalcanti, Parente, and Zhao (2004), Guiso, Sapienza and Zingales (2003), and Noland (2003).

This paper is designed to assess the strength of the evidence for a religion/growth nexus in the context of Barro and McCleary's seminal work. We do this at two levels. First, we reevaluate their statistical analysis. This reevaluation includes both strict replication questions, i.e. can one find the results they report using their data and models, as well as an assessment of the robustness of their analysis to alternate statistical models. We find that while their analysis is statistically replicable, it is not statistically robust. There is little evidence of a direct religion/growth nexus. As a result, we conclude that God is not in the details, at least not in so far as their claims that religion matters for growth.

While our analysis focuses on a specific paper, we hope the range of questions we ask and methods we employ will also be useful in describing how evidentiary support for a given growth theory should be subjected to evaluation. A problem with much of the empirical literature on growth is the tendency for the literature to focus on large claims without a commensurate degree of interest in exhaustive analysis of the strength of the claims. We hope that our admittedly unglamorous analysis shows the importance of the latter.

Section 2 of this paper describes the Barro-McCleary data and demonstrates basic statistical replicability of their baseline model. Section 3 evaluates the robustness of the religion/growth relationship to a richer set of growth models. Section 4 concludes.

2. Growth regression model and data

Barro and McCleary investigate the effects of religion on economic growth within the framework of linear cross-country growth regressions. Formally, let us cast the canonical growth regression model as a Q-simultaneous equations model (SEM)

$$g_{j,t} = X'_{j,t}\beta + Z'_{1,j,t}\gamma + \varepsilon_{j,t} \tag{1}$$

$$X_{j,t} = \Pi'_1 Z_{1,j,t} + \Pi'_2 Z_{2,j,t} + V_{j,t} \tag{2}$$

where $j = 1, 2, ..., n_t$, $t = 1, 2, ..., T$. $g_{j,t}$ is the average growth rate of income per capita for country j over a time period, $X_{j,t}$ is a k- vector of right hand side endogenous variables that include the set of religious beliefs and church attendance variables (which we will collectively refer to as Religiosity variables) as well as the set of Religion Shares, and $Q = k+1$. $Z_{1,j,t}$ is a l_1- vector of exogenous/predetermined variables and time effects. $Z_{2,j,t}$ is a l_2- vector of exogenous/predetermined (or instrumental variables) variables excluded from the growth equation (1). This system is identified if and only if $rank(\Pi_{2,t}) = k \leq l_2$. Given that the focus of the analysis is the growth equation, the literature typically estimates (1) using 2SLS.

Barro and McCleary employ an unbalanced panel dataset of a total of 41 countries (see Table 1) over three periods 1965-74 (38 countries), 1975-84 (41 countries), and 1985-94 (39 countries). The number of observations ranges from 113 to 123 across specifications. The dependent variable is the average growth rate of real per capita GDP corresponding to the three periods. The set of Religiosity measures consists of countrywide averages of individual responses to survey questions on monthly church attendance, belief in hell, and belief in heaven reported in the three waves (1981-84, 1990-93, and 1995-97) of the World Values Survey (WVS) as well as data from the International Social Survey Programme. To minimize the loss of information Barro and McCleary construct single cross-sectional measures as follows. A measure of attendance or belief for a country is defined as the value from WVS 1990 if available. If not, then the value from WVS 1981 is used. If neither of these values were available, then the values for ISSP 1991, WVS 1995, and ISSP 1998 were used in an analogous way. Finally, the value is adjusted for the average discrepancy between the two values among countries that had information for both years.

Based on Barrett (1982), the data on Religion Shares include adherent shares for Catholic, Eastern, Hindu, Jewish, Muslim, Orthodox, Protestant, and Other religions for the years 1970 and 1980. Each religion share is defined as the fraction adhering to the specified religion among persons who expressed adherence to some religion. The Catholic fraction is omitted from the regressions and thus each coefficient should be interpreted relative to the Catholic share. We note that Barro and McCleary generously provided us with the Religiosity and Religion Shares data.

Barro and McCleary also employ a set of additional covariates consisting of time dummies for each of the three time periods and the set of variables that Barro and Sala-i-Martin (2003) had found to be robust determinants of growth. These variables, measured separately in each period, are: the log of initial per capita GDP, the average years of male secondary and higher school attainment, the reciprocal of life expectancy at age 1, the average investment to GDP ratio, the log of the total fertility rate, the ratio of exports plus imports to GDP (filtered for the usual relation of this ratio to the logs of population and area), the ratio of government consumption (net of outlays on defense and education) to GDP, the growth rate of the terms of trade interacted with the ratio of exports plus imports to GDP, the Political Risk Services indicator of the rule of law, the Freedom House measure of political rights and its square, and the consumer price inflation rate. We obtained the data for these additional control variables from various sources including Barro and Lee (1994); see the Data Appendix[2].

To address the possible endogeneity of right-hand side variables, Barro and McCleary instrument the Religiosity variables with a dummy variable that indicates the presence of a State Religion in 1970, a dummy variable that indicates the presence of State Regulation of religion in 1970, and a measure of Religious Plurality. This last variable is defined as one minus the Herfindahl index constructed from the Religion (adherence) Shares in 1970 and 1980 (1990 for Poland). For the calculation of this index, the share of Buddhism was distinguished from the share of other Eastern religions. Barro and McCleary report the first stage coefficients to show that their instruments for the Religiosity variables are valid.[3] To deal with the endogeneity of Religion Shares, they use as instruments the lagged shares; 1970 for the first two periods and 1980 for the third. The instrument list for the additional controls includes beginning of period or lagged

---

[2] Barro and McCleary did not share most of these data with us, which will prove to have some, but not great, significance below.

[3] Barro and McCleary use these instruments to address reverse causation from growth to religiosity. One possible channel for reverse causation is given by the secularization hypothesis, which says that economic development causes individuals to become less religious, as measured by church attendance and religious beliefs.

values of all the covariates with the exception of inflation. Inflation is instrumented with the Spain and Portuguese colonial dummy.

The key findings of Barro and McCleary are reported in Table 4 of that paper. Table 3 of this paper contains our replication results. We were able to replicate Barro and McCleary's results relatively closely. In particular, our replication results affirm Barro and Cleary's results for belief in hell and monthly church attendance. As shown in Table 3, the coefficient to monthly church attendance is negative while that for belief in hell or belief in heaven is positive. As in Barro and McCleary these coefficients are individually and jointly statistical significant. There are only a few small differences in the degree of significance. Our replication shows stronger evidence in favor of belief in heaven but weaker evidence in belief in hell. More precisely, while Barro and McCleary find that belief in heaven is not significant in system (4) we find that it is significant at 1%. Conversely, while Barro and McCleary find that belief in hell is significant in systems in (5) and (6) at 1% and 5%, respectively, we find that they are significant at 5% and 10%, respectively. We were also able to affirm the marginal significance for Muslim, Orthodox, and Protestant Shares. While we were not able to confirm the statistical significance of the Hindu share we were able to verify the joint statistical significance of Religion Shares. Overall, we conclude that Barro and McCleary's results are generally statistically replicable using the data they provided. We attribute the small discrepancies of our replication exercise to the fact that they did not share with us their data on the set of additional controls.

3. Methodology

3.1 Robustness of the religion/growth relationship

While Barro and McCleary's claims appear to be statistically replicable, a separate question is whether they are statistically robust. As Brock and Durlauf (2001) and other researchers have argued, exploring the quantitative consequences of new growth theories presents unique challenges to researchers. These difficulties arise to a large extent because the nature of growth theories is such that they are inherently *open-*

ended. By theory open-endedness, Brock and Durlauf refer to the idea that, in general, the statement that a particular theory of growth is empirically relevant does not logically preclude other theories of growth from also being relevant. This means that an evaluation of the statistical relationship between growth and religion needs to account for the plethora of growth determinants that exist in the empirical literature; specifically, a causal relationship between religion and growth has no implications for whether a causal relationship exists between geography and growth or any other variable.

Dealing with theory uncertainty is therefore of first-order importance if we are concerned with understanding the strength of evidential support for the link between religiosity variables and growth. Barro and McCleary avoid this issue by choosing to include additional control variables on the basis of an assessment of what Barro and Sala-i-Martin (2003) identify as empirically important growth determinants. But this assessment itself relies on a subjective reading of a body of papers that itself suffers from a lack of attention to this same question Thus, they in essence engage in model selection without the formal specification of a common body of data, a set of models to consider, and a well-defined metric for evaluation. It is also far from clear that their choices on growth controls well reflect the current state of empirical thinking on growth. An important substantive problem in their analysis is the lack of evaluation of religion against alternative fundamental growth determinants, in particular institutions, geography, and ethnic heterogeneity, each of which has been found by other authors to be empirically important. None of these alternate channels was a part of the model selection exercise employed to identify additional controls in the Barro and McCleary analysis.

Beyond the question of the absence of a formal model selection analysis, it is unclear that model selection is even appropriate for an exercise of this type. In the presence of a range of possible growth specifications, inference on the religion/growth nexus should reflect the relative evidentiary support for each model, and not be contingent on one of the models, even if there is a sense that it has the highest posterior probability of being the true one. As discussed in Durlauf, Johnson and Temple (2005), the empirical growth literature has failed to resolve the question of the appropriate growth determinants in a given exercise, and so there is no baseline model with respect to which one can assess the additional explanatory power of religion.

For these reasons, we regard it as important to evaluate the robustness of their findings. To evaluate robustness, we employ model averaging methods to account for the broad theoretical background against which a religion/growth relationship must be assessed. Model averaging methods have proven useful in a number of growth studies, see Brock and Durlauf (2001), Fernandez, Ley and Steel (2001), Doppelhofer, Miller, and Sala-i-Martin (2004) and Masanjala, and Papageorgiou (2007) for examples in the growth literature; the methodology has also proven useful in both macroeconomics (Brock, Durlauf, and West (2003) and Cogley and Sargent (2005)) and in economic forecasting (Garratt et al (2003)). Our current application is somewhat different from those in that we focus on a specific theory rather than engage in a horserace across all theories. This strategy is chosen since our goal is to assess the religion/growth relationship against the current body of growth theories, not assess all theories simultaneously.

3.2 Model Averaging

To understand the model averaging approach one starts with the idea that a standard cross-country growth regression analysis of the type performed by Barro and McCleary constructs estimates of the parameters that are conditional on the available data, *D*, and the specification of the growth model, *m*. A growth model, in this case, is defined by a particular combination of regressors from a given universe of growth regressors. The set of all possible combinations of regressors from this set form the model space. The model averaging approach takes the "true" model as unknown.

Consider the vector of slope coefficients of equation (1) for a particular growth model *m*, $\alpha_m = \left(\beta_m, \gamma_m\right)'$. The corresponding 2SLS estimate, $\hat{\alpha}_{D,m}$ which is the focus of the Barro-McCleary analysis is an object that is constructed by conditioning on both the available data D and the given model *m*. As we have suggested, there do not exist good reasons for assuming that a particular growth model is the true one. How can one move beyond the dependence of statistical inferences on parameters of interest on the choice of a given model? We proceed by constructing estimates conditional not on a single model, but on a model space whose elements span an appropriate range of growth determinants, as explained below.

Operationally, we employ a "hybrid" approach to model averaging that "integrates out" the uncertainty over models by taking the average of model-specific frequentist 2SLS estimates, $\hat{\alpha}_{D,m}$, weighted by model weights, $\hat{\mu}_{m,D}$, objects that depend on the data and the model, and which are constructed to be analogous to posterior model probabilities. Sala-i-Martin, Doppelhofer, and Miller (2004) pioneered this approach in economics. In that paper, Sala-i-Martin et. al. argue that the weighting scheme for their "hybrid" model average estimator can be derived as a limiting case of a standard Bayesian analysis as the prior information becomes "dominated" by the data. Similarly, we provide a Bayesian interpretation of our proposed model average estimator in the Technical Appendix. Hybrids of this type are controversial from the perspective of the philosophical foundations of statistics since they mix frequentist probability statements about observables given unobservables and Bayesian probability statement about unobservables given observables, We do not pursue such issues, as our concern is exclusively with communicating the evidentiary support across structural estimates in the special case of just-identification using a computational feasible algorithm. Further, a fully Bayesian model averaging analysis in the context of overidentification is currently not well understood in the relevant statistics and econometrics literatures, so a fully Bayesian implementation is beyond the scope of this paper.

Hybrid model averaging yields an estimate of the vector α,

$$\hat{\alpha}_{D,M} = \sum_{m \in M} \hat{\alpha}_{D,m} \hat{\mu}_{m,D} \tag{3}$$

where $\hat{\mu}_{m,D}$ is the posterior weight for model *m*. Note that the MA estimate $\hat{\alpha}_{D,M}$ depends on data D and model space *M* rather than a single element of *M*. Similarly, we can also obtain the following analogous posterior variance of the parameter vector α,

$$\hat{\sigma}^2_{\alpha|D,M} = \sum_{m \in M} \hat{\sigma}^2_{\alpha|D,m} \hat{\mu}_{m,D} + \sum_{m \in M} \left(\hat{\alpha}_{D,m} - \hat{\alpha}_{D,M} \right)^2 \hat{\mu}_{m,D}, \tag{4}$$

which we use to compute standard errors for the model averaged estimates.

As suggested above, we construct the model weights by analogy to posterior probabilities. This means that the weights follow, using Bayes' rule,

$$\hat{\mu}_{m,D} \propto \hat{\mu}_{D,m}\mu_m \tag{5}$$

so that each weight is the product of the integrated likelihood of the data given a model, $\hat{\mu}_{D,m}$, and the prior probability for a model, μ_m. We discuss the integrated likelihood and the structure of model priors in the following two sub-sections.

3.2.1 integrated likelihood

The integrated likelihood of the data given a model reflects the relative goodness of fit of different models. In the context of linear regression with normal errors one may approximate this quantity with the BIC. However, while there has been a formal justification for employing the BIC approximation in the case of MLE or LS (see Raftery, 1995), little has been known for the case of 2SLS. In this paper we generalize Raftery's BIC approximation to the case of endogenous variables by exploiting the framework of Chao and Phillips (1998), who study the Bayesian analysis of SEM. More precisely, we use their version of Laplace approximation to approximate the integrated likelihood for the case of just-identification (see Technical Appendix). All the models explored in this paper are just-identified. This approximation yields the following limited information BIC (LIBIC)

$$\log \hat{\mu}_{D,m} = -\frac{\tilde{n}\left(k_m+1\right)}{2}\log\left(2\pi\right) - \frac{\tilde{n}}{2}\log\left(\det(\hat{\Omega}_m)\right) - \frac{h_m}{2}\log\left(\tilde{n}\right) + O((\tilde{n})^{-1}), \tag{6}$$

where $h_m = (k_m + l_{1,m})\left(k_m+1\right) + 0.5\left(k_m+1\right)\left(k_m+2\right)$ is the dimension of the parameter vector for model m, $\theta_m = (\beta_m, \gamma_m, vec(\Pi_{1,m}), vec(\Pi_{2,m}), \tilde{\sigma}_m^2)$, and where k_m and $l_{1,m}$ are the corresponding model specific parameters for the endogenous and exogenous regressors for model m .

3.2.2 model priors

Along with the integrated likelihood, model averaging also requires one to specify priors over the models in the model space M . This turns out to be a nontrivial task. At first glance, it would appear reasonable that if a researcher does not have any a priori information to distinguish between models, she should assign equal prior weights to each model. This is, in fact, the standard practice in the literature; i.e., where there is uncertainty over which of the p regressors in M are present, each of the 2^p models in the model space is assigned probability 2^{-p} . This is equivalent to assuming that the prior probability that a given variable is present in the "true" model is 0.5 independent of the presence or absence of any of the other p regressors in the model. And in fact this prior is the most commonly used one in the model averaging literature.

This uniform prior across models, however, ignores interrelations between different variables. As argued in Brock and Durlauf (2001) and Brock, Durlauf and West (2003), the probability that one variable affects growth may be logically dependent on whether others do. They describe this phenomenon as being analogous to the irrelevance of independent alternatives (IIA) in the discrete choice literature. Why is the IIA problem of particular importance in the growth context? An important consideration in the growth literature has been to evaluate the relative importance of various fundamental growth *theories*. Our primary concern, in this paper, for instance, is to evaluate claims that religion is important to growth. Therefore, in principle, what a researcher would want to do is to start by being agnostic about the a priori validity of fundamental growth theories, and then examine the posterior evidence in favor of or against each of these theories after viewing the data. However, if the uniform prior is employed, a researcher could arbitrarily increase or reduce the prior weights across *theories* simply by judiciously introducing "redundant" proxy variables for some of these theories.

To handle these interdependencies across theories created by the introduction of redundant variables, we set the prior probability that a particular *theory* – that is, the set of proxy variables classified under that theory – is included in the "true" model to 0.5 to reflect non-information across theories. This prior specification also assumes that theories are independent in the sense that the inclusion of one theory in a model does not affect the probability that some other theory is also included.

Growth empirics also suffer from another problem that we refer to as *specification uncertainty*. In our context, this problem translates into concerns over what variables out of a potentially large set adequately proxies for each theory. New growth theories often do not naturally translate into specific regressors for a model such as (1). Rather, the theories are qualitative in the sense that multiple empirical proxies exist for each theory. Specification uncertainty results in dependencies between potentially irrelevant proxy variables *within* theories. If we ignore these dependencies by assigning uniform weights across all possible combinations of variables classified under each theory, then analogous to the discussion above, we would end up putting excess prior weights on many similar, but not very informative combinations while taking weight away from more unique and informative alternatives.

To deal with this problem, we introduce a version of George's (1999) *dilution priors*. Given that a theory T is a priori relevant, we assign to each possible combination of variables classified under this theory γ_T the following conditional prior probability,

$$\mu^D(\gamma_T) = \left|R_{\gamma_T}\right| \prod_{j=1}^{p_T} \pi_j^{\gamma_j} \left(1-\pi_j\right)^{1-\gamma_j} \tag{7}$$

where p_T is the number of proxy variables for theory T, $\pi_j = 0.5$ for $j = 1,\ldots, p_T$, and R_{γ_T} is the correlation matrix for the set of variables included in γ_T. Since $|R_{\gamma_T}|$ goes to 1 when the set of variables are orthogonal and 0 when the variables are collinear, these priors are designed to penalize models with many "redundant" variables while preserving weights on unique and informative combinations. Figure 1 shows our model priors as represented by a hierarchical tree structure[4].

[4] Other proposals to deviate from "flat" model priors have been advanced in the literature. For instance, Sala-i-Martin, Doppelhofer, and Miller (2004) alter the probability of variable inclusion in order to give greater weight to models with a small number of regressors. Brown, Vannucci, and Fearn (1998, 2002)

3.3 Implementation

In terms of our implementation, as discussed above, our aim is to nest Barro and McCleary's model within a larger model space that includes the canonical *Neoclassical Growth* variables – the log of initial per capita GDP, the average years of male secondary and higher school attainment, the average investment to GDP ratio, and the log of the average population growth rate plus 0.05 – and the recent fundamental growth theories. In addition to *Religiosity* and *Religion Shares*, we focus on five other *fundamental* growth theories: *Geography*, *Ethnic Fractionalization*, *Political Institutions*, *Property Rights Institutions*, and *Contracting Institutions*. In our view, religion is on par with geography, institutions, and ethnic heterogeneity as a potential fundamental growth determinant. While it seems clear that the weight of the empirical evidence supports the view that institutions[5] are in general a more salient source of growth differences than geography, our own view (cf. Tan (2009)) is that, at least from an a priori standpoint, both potentially play some role.

In keeping with the recent "geography versus institutions" debate in the growth literature (see, Rodrik, Subramanian, and Trebbi (2004) and Sachs (2003)), we include a climate variable – the percentage of a country's land area classified as tropical and subtropical via the Koeppen-Geiger system (KGATSTR) – as well as a measure of geographic accessibility/isolation – the percentage of a country's land area within 100km of an ice-free coast (LCR100KM) under Geography. Political Institutions consist of a measure of democracy and its square. Here we follow Barro and McCleary (2003) who base their choice on work showing a nonlinear relationship between democracy and growth (e.g., Barro (1996)). Following Acemoglu and Johnson (2005), we distinguish between two types of economic institutions: Property Rights Institutions comprise of a measure of the risk of expropriation of private investments as well as a measure of

---

assume that the probability a given variable is included is itself a random variable drawn from some distribution. This allows different variables to be included with different probabilities. However, the IIA assumption remains common to these approaches.

[5] Acemoglu, Johnson and Robinson (2001, 2002) are now standard references and Acemoglu, Johnson, and Robinson (2006) is a brilliant overview of the role of institutions in the growth process.

constraints on executive power while Contracting Institutions is proxied by an index of legal formalism (CHECK) measuring the number of procedures for collecting on a bounced check. Finally, we proxy Ethnic Fractionalization with a measure of linguistic fractionalization due to Alesina et al (2003).

Next, we organize the additional covariates employed by Barro and McCleary (2003) into two *proximate* growth theories: *Demography* (the reciprocal of life expectancy at age 1 and the log of the total fertility rate), and *Macroeconomic Policy* (the ratio of exports plus imports to GDP, the ratio of government consumption to GDP, the growth rate of the terms of trade interacted with the ratio of exports plus imports to GDP, and the inflation rate). Finally, we include as a theory, *Regional Heterogeneity* which consists of a dummy variable for East Asian countries and one for Sub-Saharan African countries.

In terms of the choice of variables used to instrument for endogenous regressors, we attempted to follow Barro-McCleary's choices as closely as possible for the regressors that they used in their paper. For the additional covariates in the model space, we tried to adhere to the existing literature where possible while ensuring that the sample of countries found in Barro-McCleary's sample were retained. Religiosity variables were instrumented with the dummy variables for state religion, state regulation of religion, and religious pluralism while Religion shares were instrumented with lagged values. The Neoclassical Growth, Demography, and Macroeconomic Policy variables were also instrumented using lagged values except for the inflation variable which was instrumented with the Spain or Portugal colonial dummy. Finally, Contracting Institutions were instrumented with the British legal origin dummy.

We refer the reader to the Data Appendix for a detailed description of the variables and data.

In terms of our MA results, we report both structural (2SLS) and reduced form (LS) estimates. The 2SLS MA results are based on the LIBIC approximation to the integrated posterior (LIBIC-MA; as described in section 3.2 above) as well as the BIC approximation (2SLS-BIC MA). The latter can be viewed as a robustness exercise and can be justified by Raftery (1995) in the following sense. In that paper, Raftery showed that the BIC penalty holds if we employ FIML estimators for MA in the structural framework. However, for our current application, there are simply not sufficient degrees of freedom available to carry out FIML, and so we simply replaced FIML with 2SLS. We believe that this is a sensible robustness exercise especially given that we only consider just identified models.[6] The LS MA results are based on Raftery's least squares MA methodology where he also employs the BIC approximation to the integrated posterior (LS-BIC MA). In this latter case, we ignore the structural framework of Barro and McCleary in order to get some sense of whether the results are qualitatively robust to the exclusion of the instruments. Finally we assess the robustness of our findings to alternative specifications of model priors by considering uniform priors (as opposed to hierarchical priors) as well as exercises that allow certain variables (e.g. religiosity) to present in all models in the model space.

3.4 Findings

We present our main findings in Table 4. Panels A-C, Column (1) reports the MA results based on LIBIC while columns (2)-(3) and columns (4)-(5) present the results for 2SLS-BIC MA and LS-BIC MA, respectively. Columns (2) and (4) report the posterior inclusion probabilities for variables as well as "collectively" for theories. The posterior probability of inclusion of theory *j* is defined as the sum of those model posterior probabilities that include at least one proxy variable of theory *j*. Columns (3) and (5) report posterior means and posterior standard errors. Finally, columns (6) and (7) present the classical 2SLS and LS estimates of the "kitchen sink" model; i.e., the largest model in our model space (all variables included). The "kitchen sink" approach has been used in growth empirics when a "horserace" between fundamental determinants of growth is desired (see, for instance, Rodrik, Subramanian, and Trebbi (2004) and Sachs (2003)). In all the MA exercises reported in the table we assumed hierarchical priors (as discussed in section 3.2) and retained time period dummies in all specifications to capture the fixed time effects. With the exception of time dummies all variables of the model space were allowed be present or absent from a model.

[6] In unreported exercises we also considered 2SLS and LS model averaging results based on an AIC criterion that allows for a weaker penalty. Our main findings remained unchanged.

As an overview of our results, we find that LIBIC MA assigns almost all posterior weight ex post to one model, and negligible weight to the others. To put it differently, MA based on LIBIC is equivalent to model selection in this particular case. Hence, we do not report posterior inclusion probabilities for this model in Table 4. As we will see below, the 2SLS-BIC MA and LS-BIC MA specifications deliver findings that are less stark compared to LIBIC MA because they place non-neglible posterior weight on a number of models in the model space. Nevertheless, the findings by LIBIC MA are generally affirmed by the 2SLS-BIC MA and LS-BIC MA results. We now turn to a detailed discussion of our findings.

3.4.1 religiosity

Our key finding is that there is no evidence that either religious beliefs or monthly church attendance matter to growth once we control for model uncertainty. None of the religiosity variables exhibited substantial posterior inclusion probability or turned out to be significant for all MA estimation methods. More importantly, in the case of LIBIC MA none of the religiosity variables was included in the selected model. In the cases of 2SLS-BIC MA and LS-BIC-MA the evidentiary support for these variables, although not zero, was weak. For belief in heaven and belief in hell, we find that the posterior probabilities of inclusion in the "true" model are negligible (less than 1%) and the corresponding coefficients are insignificant. There is stronger evidence for the inclusion of monthly church attendance in the "true" model; the posterior probability of inclusion is marginally larger than the prior of 50% at about 57% when the MA is based on 2SLS-BIC and 62% when the MA is based on LS-BIC. However, in both cases, the marginal effect of monthly church attendance of growth was found to be negative (as in Barro-McCleary) but not statistically significant. Finally, in terms of the overall posterior probability of theory inclusion for Religiosity as a growth theory, we find unsurprisingly that this probability is driven in both cases by that for monthly church attendance since the posterior probability of inclusion for the belief in heaven and hell variables are close to zero.

All these MA results are in sharp contrast with the results of Barro and McCleary (Table 3) and the classical "kitchen-sink" results presented in columns (6)-(7). While both Barro and McCleary and the classical "kitchen sink" results provide evidence for the significance of the effects of Religiosity variables on growth, the MA results do not.

We can also compare the posterior mode models for our MA exercises and the Barro-McCleary specification. Table 5 presents results for the posterior mode models based on LIBIC (column 1), 2SLS-BIC (column 2), and LS-BIC (column 3). Note that the results for column (1) in Table 5 are the same as those for LIBIC-MA in Table 4, column (1). The key difference between the LIBIC results and the posterior mode models for 2SLS-BIC and LS-BIC MA is that the latter two include monthly church attendance as a growth determinant. The coefficient to monthly church attendance is negative and only marginally significant for the 2SLS-BIC case at the 10% level, but it is negative and strongly significant at the 1% level for the LS-BIC case. However, like with LIBIC, neither belief in hell nor belief in heaven is included as a covariate. It turns out that the posterior weights assigned to the respective posterior mode models are 0.467 for the 2SLS-BIC case and 0.500 for the LS-BIC case. This finding suggests that if one wants to engage in model selection based on the evidentiary weight of the data, the model proposed by Barro-McCleary is very unlikely to be the one that one would chose. Hence, even though the posterior mode model for the LS-BIC case finds a significant role for religiosity (in terms of monthly church attendance), the interpretation of these results necessarily differ from the one provided by Barro and McCleary. Religiosity has a negative impact on growth.

Overall, we conclude that there is simply insufficient evidence to support Barro and McCleary's contention that countries with more efficient religious sectors will tend to grow faster. In fact, there is little evidence to suggest that Religiosity matters to growth at all.

3.4.2 religion shares

The results for the Religion Shares appear to be mixed. In the case of LIBIC-MA we find that Eastern Religion and Jewish adherent shares appear to have strongly significant positive effects on growth. However, these findings are not robust to alternative MA estimation because when we apply 2SLS-BIC MA and LS-BIC MA we find that none of the Religion Shares appears to be important for growth. The posterior probability of theory inclusion for Religion Shares is 35% and 28% for 2SLS-BIC MA and LS-BIC MA, respectively. In contrast, the classical estimates for both the "kitchen sink" (columns (6)-(7) of Table 4) and the Barro and McCleary model (Table 3) suggest that some religious affiliations have growth consequences. In particular, the classical "kitchen sink" results show that Muslim, Orthodox, Protestant, and Other Religion shares have significant marginal effects on growth. Hence, the "kitchen sink" findings are at least broadly compatible with those of Barro and McCleary. However, our MA results suggest that these findings are not robust once we account for model uncertainty.

3.4.3 other determinants

We find some robust evidence for the Neoclassical growth theory in the form of "conditional convergence"; the coefficient to the logarithm of initial income per capita is negative and highly significant (at the 1% level) across all MA specifications. The posterior inclusion probability across MA methods is also close to 1. A negative coefficient on log initial income per capita is typically taken as evidence in the literature that poorer countries are catching up with richer countries after controlling for heterogeneity. Our findings are therefore consistent with those in the existing "conditional convergence" literature. Nevertheless, we do not find any robust role for either human or physical capital accumulation, or population growth.

Beyond the Neoclassical growth theory we find robust evidentiary support for Macroeconomic Policy (as proxied by trade openness), Fractionalization (as proxied by language), and Property Rights Institutions (as proxied by expropriation risk). These results hold for all MA methods and the corresponding posterior inclusion probabilities for theory are all approximately equal to 1. Our results are consistent with those of the broader growth literature. For instance, our findings for the negative significant impact of ethnic fractionalization on growth are similar to the ones found by Easterly and Levine (1997), Alesina et. al. (2003), and Brock and Durlauf (2001). Similarly, our results for the importance of expropriation risks are consistent with those of Acemoglu and Johnson (2005). Our results therefore support Acemoglu-Johnson's thesis that it is the rules governing the interactions between the population and political elites rather than the rules that govern the interactions between individuals that appear to be more salient to growth.[7]

We also find some evidence for the role of Demography (as proxied by the reciprocal of Life Expectancy at age 1), Geography (as proxied by LCR100km) and another Macroeconomic Policy variable, Inflation, in affecting growth outcomes. Although LIBIC MA provides no evidentiary support for these variables, 2SLS-BIC MA and LS-BIC MA do (see columns (2)-(4)). More precisely, we find that lower life expectancy has a strongly significant adverse effect on growth with posterior inclusion probability of about 92% in the case of 2SLS-BIC MA and 96% in the case LS-BIC MA. Inflation appears to be bad for growth with posterior inclusion probability of about 99%. Finally, geographic accessibility (LCR100KM) appears to negatively affect growth with posterior inclusion probabilities of about 95% - 97%.

3.4.4 robustness

We further assess the robustness of our structural (2SLS) MA results to alternative model prior specifications; we report these findings in Table 6 for the religiosity variables and the religion shares. [8] Columns (1)-(5) of Table 6 refer to LIBIC MA while column (6) refers to 2SLS-BIC MA. Columns (1) to (4) of Table 6 contain results for cases where particular subsets of variables are assumed a priori to be always included in the "true" model. For instance, the LIBIC MA exercises for which results are reported in column (1) assume that the variables employed in Barro and McCleary's baseline model are included in all models in the model space. Similarly, columns (2) and (3) report results for exercises where, respectively, all Religiosity variables and all Religiosity and Religion Shares variables are retained in all models in the model space, while column (4) reports results for LIBIC MA exercises where the canonical

[7] In response to a request from a referee we also considered hierarchical priors with dilution but grouping all institutional variables into one theory. The results remained the unchanged.

[8] For conciseness we do not report the robustness results for the other growth determinants as the inference generally remained qualitatively unaffected. Complete results are available from the authors upon request.

Neoclassical growth variables are always included in all models. In columns (5)-(6) we also experiment with replacing our *hierarchical* model priors with *uniform* priors. That is, we disregard any theoretical distinctions between variables so that instead of having each of the growth *theories* be assigned a 0.5 prior probability of being included in the "true" model, we allow each individual *variable* instead to have a 0.5 prior probability of being included in the "true" model. Uniform priors are an alternative means of specifying non-information about which model in our model space is the "true" model (or, is closest to it in some well-defined sense). As we discuss in Section 3.2.2 above, however, the use of uniform priors, while standard practice in the literature, may nevertheless, be inappropriate in the growth context. In any case, these results are reported in column (5) for LIBIC MA and column (6) for 2SLS-BIC MA.

We find that our results are largely robust to these perturbations. In all cases, we do not find any significant growth effects for belief in hell, belief in heaven, or monthly church attendance. This finding suggests yet again that Barro and McCleary's results on the importance of religiosity to growth, as well as the interpretation they attach to their results, are heavily contingent on their particular model specification.

4. Conclusion

In this paper, we evaluate the robustness of the link between religion and economic performance using Bayesian model averaging methods to account for model uncertainty. In sharp contrast to existing work in the literature, we find no evidence that the religiosity is quantitatively important to growth. There is simply no evidence that religious beliefs (such as beliefs in the existence of hell or heaven) have a direct robust relationship with economic growth. At best, we find some evidence that monthly church attendance may have an adverse impact on growth. Our collective findings lead us to conclude that there is very little in the data to support the contention that a country's economic performance has anything whatsoever to do with the efficiency of its religious sector in generating beliefs.

We conclude by noting that it is difficult to overstate the stakes in the outcome of the current debates on religion's role in economic performance. The advocacy value of this new area of work owes in no small measure to its potential for (mis-)application to important and ongoing public policy controversies. Justified or not, results from the empirical analysis of the religion/growth nexus will provide ammunition to proponents of various policy positions that are still controversial in contemporary discussions. Getting the empirics right on this matter is therefore of first-order importance. We view this paper as a first step in that direction.

Bibliography

Acemoglu, D., S. Johnson and J. Robinson (2001), "The Colonial Origins of Comparative Development: An Empirical Investigation", *American Economic Review* 91(5):1369-1401.

Acemoglu, D., S. Johnson and J. Robinson (2002), "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution", *Quarterly Journal of Economics* 117(4):1231-1294.

Acemoglu, D and S. Johnson (2005), "Unbundling Institutions", *Journal of Political Econom*y, 113(5), 949-995.

Acemoglu, D., S. Johnson and J. Robinson (2006), "Institutions as the Fundamental Cause of Long-run Growth," *Handbook of Economic Growth*, P. Aghion and S. Durlauf, eds., Amsterdam: North Holland.

Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat and R. Wacziarg, (2003), "Fractionalization," *Journal of Economic Growth*, 8, 2, 155-194.

Barrett, D.B. (1982), *World Christian Encyclopedia*, 1st ed., Oxford, Oxford U. Press.

Barrett, D.B., G.T. Kurian, and T.M. Johnson (2001), *World Christian Encyclopedia*, 2nd ed., Oxford, Oxford University Press.

Barro, R., (1996), "Democracy and Growth." *Journal of Economic Growth,* 1(1), 1-27.

Barro, R. and R. McCleary, (2003), "Religion and Economic Growth Across Countries," *American Journal of Sociology*, 68, 760-781.

Barro, R. and J.-W. Lee (1994), "Data Set for a Panel of 138 Countries", National Bureau of Economic Research.

Barro, R. and X. Sala-i-Martin, (2003), *Economic Growth*, 2nd edition, Cambridge: MIT Press.

Brock, W. and S. Durlauf, (2001), "Growth Empirics and Reality," *World Bank Economic Review*, 15, 2, 229-272.

Brock, W., S. Durlauf, and K. West, (2003), "Policy Analysis in Uncertain Economic Environments (with Discussion)." *Brookings Papers on Economic Activity*, 1, 235-322.

Brown, P.J., M. Vannucci, and T. Fearn, (1998), "Multivariate Bayesian Variable Selection and Prediction," *Journal of the Royal Statistical Society*, Series B, 60 (3), 627-641.

Brown, P.J., M. Vannucci, and T. Fearn, (2002), "Bayes Model Averaging with Selection of Regressors," *Journal of the Royal Statistical Society*, Series B, 64 (3), 519-536

Cavalcanti, T., S. Parente, and R. Zhao (2004), "Religion in Macroeconomics: A Quantitative Analysis of Weber's Thesis," mimeo, University of Chicago.

Chao, J.C. and P.C.B. Phillips (1998), "Posterior Distributions in Limited Information Analysis of the Simultaneous Equations Models using the Jeffreys' Prior", *Journal of Econometrics*, 87, 49–86.

Cogley, T. and T. J. Sargent, (2005), "The Conquest of US Inflation: Learning and Robustness to Model Uncertainty," *Review of Economic Dynamics*, Academic Press for the Society for Economic Dynamics, 8 (2), 528-563.

Davidson, R. and McKinnon, J. (2003), Econometric Theory and Methods, Oxford University Press

Doppelhofer, G., R. Miller and X. Sala-i-Martin, (2004), "Determinants of Long-term Growth: a Bayesian Averaging of Classical Estimates (BACE) Approach," *American Economic Review*, 94, 4, 813-835.

Durlauf, S.N., P. Johnson, and J. Temple, (2005), "Growth Econometrics," in *Handbook of Economic Growth*, P. Aghion and S.N. Durlauf, eds., North Holland, Amsterdam.

Easterly, W. and R. Levine, (2003), "Tropics, Germs, and Crops: How Endowments Influence Economic Development," *Journal of Monetary Economics*, 50, 3-39.

Easterly, W. and R. Levine, (1997), "Africa's Growth Tragedy: Policies and Ethnic Divisions", *Quarterly Journal of Economics*, 112 (4), p.1203-50.

Fernandez. C., E. Ley and M. Steel, (2001), "Model Uncertainty in Cross-Country Growth Regressions," *Journal of Applied Econometrics*, 16, 5, 563-76.

Garratt, A., K. Lee, M. H. Pesaran, Y. Shin, (2003), "Forecasting Uncertainties in Macroeconometric Modelling: An Application to the UK Economy," *Journal of the American Statistical Association*, 98 (464), 829–838.

George, E. I., (1999), "Discussion of Bayesian Model Averaging and Model Search Strategies by M.A. Clyde," *Bayesian Statistics 6*, 175-77, Oxford.

Guiso, L., P. Sapienza, and L. Zingales, (2003), "People's Opium? Religion and Economic Attitudes," *Journal of Monetary Economics*, 50, 225-282.

Kleibergen, F. and E. Zivot, (2003), "Bayesian and Classical Approaches to Instrumental Variable Regression," *Journal of Econometrics*, 114(1), 29-72.

Masanjala, W. and C. Papageorgiou (2007), "Rough and Lonely Road to Prosperity: A Reexamination of the Sources of Growth in Africa Using Bayesian Model Averaging", *Journal of Applied Econometrics*, forthcoming.

Noland, M., (2003), "Religion, Culture, and Economic Performance," IIE Working Paper Series WP03-8, Institute for International Economics.

Raftery, A.E. (1995), "Bayesian Model Selection in Social Research (with Discussion)", *Sociological Methodology*, 25, 111-196.

Rodrik, D., A. Subramanian, and F. Trebbi, (2004), "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development", *Journal of Economic Growth*, 9(2), 131-165.

Sachs, J., (2003), "Institutions Don't Rule: Direct Effects of Geography on Per Capita Income", NBER Working Paper No. 9490.

Tan, C. M., (2009), "No One True Path: Uncovering the Interplay between Geography, Institutions, and Fractionalization in Economic Development", *Journal of Applied Econometrics*, forthcoming.

Technical Appendix: Bayesian Interpretation of LIBIC MA

Let $N = n_1 + n_2 + \cdots + n_T$. Then expressing the SEM model (1)-(2) in matrix form, we get

$$g = X_m \beta_m + Z_{1,m} \gamma_m + \varepsilon_m \tag{A1}$$

$$X_m = Z_{1,m} \Pi_1 + Z_{2,m} \Pi_2 + V_m \tag{A2}$$

where $g : N \times 1$ and $X_m : N \times k_m$ are the $Q_m = k_m + 1$ stacked endogenous variables. $Z_{1,m} : N \times l_{1,m}$ and $Z_{2,m} : N \times l_{2,m}$ are, respectively, stacked data matrices of included and excluded exogenous/predetermined variables in equation (A1). $\varepsilon_m : N \times 1$ and $V_m : N \times k_m$ are a vector and a matrix of structural errors, respectively. We also assume that $\left\{ \begin{pmatrix} \varepsilon_{m,j,t} \\ V_{m,j,t} \end{pmatrix} \right\}_{j,t} \sim NIID(0, \Sigma_m)$, where $\Sigma_{m,t}$ is a $Q_m \times Q_m$ symmetric positive definite error covariance matrix

$$\Sigma_m = \begin{pmatrix} \sigma^2_{\varepsilon,m} & \sigma'_{\varepsilon V,m} \\ \sigma_{\varepsilon V,m} & \Sigma_{V,m} \end{pmatrix} \tag{A3}$$

Our "hybrid" approach to model averaging combines posterior model probabilities with 2SLS parameter estimates, which retain a Bayesian interpretation in the following sense. We assume the Jeffreys prior for the parameters of the SEM in equations (A1)-(A2), that is the prior which is proportional to the square root of the determinant of the information matrix. As shown in Chao and Phillips (1998) and Kleibergen and Zivot (2003) the Jeffreys prior gives rise to a posterior for the structural parameters that mimics the LIML estimator and avoids pathological problems for the case of just-identification[9]. This is important for our application because all models in our model space are just-

[9] This contrasts with another popular choice for diffuse priors, the Dreze prior. For the case of the Dreze prior, the posterior distribution is nonintegrable for the case of just-identification.

identified, that is, $rank(\Pi_2) = k_m = l_{2,m}$ for all $m \in M$. Given that under just-identification LIML is equivalent to 2SLS we further replace LIML by 2SLS.

Consider the structural parameters in equations (3) - (4) $\theta = (\beta, \gamma, vec(\Pi_1), vec(\Pi_2), \tilde{\sigma}^2)$, where $\tilde{\sigma}^2$ is the $\frac{1}{2}(k_m+1)(k_m+2)\times 1$ vector of nonredundant elements of Σ_m. Define

$$g(\theta) = \log\left(\mu\left(D\middle|\theta, m\right)\mu\left(\theta \mid m\right)\right) \tag{A4}$$

so that

$$\mu\left(D\middle|m\right) = \int \exp(g(\theta))d\theta \tag{A5}$$

where $\mu\left(D\middle|\theta, m\right)$ is the likelihood of the parameters θ under model m, $\mu\left(\theta \mid m\right)$ is the corresponding prior, and $\mu\left(D\middle|m\right)$ is the integrated likelihood. Then using the Laplace approximation (as defined in appendix A of Phillips and Chao, 1998) we get

$$\mu\left(D \mid m\right) \approx \exp\left(g\left(\hat{\theta}\right)\right).\left(2\pi\right)^{\frac{h_m}{2}}.\left(\det\left(-g''\left(\hat{\theta}\right)\right)\right)^{-\frac{1}{2}} \tag{A6}$$

Let $\hat{\theta}$ be a LIML estimator (or 2SLS, in the case of just-identification), then $g''\left(\hat{\theta}\right) \approx \tilde{n} I_\theta$, where I_θ is the $h_m \times h_m$ matrix of the Fisher information for one observation.

$$\mu\left(D \mid m\right) \approx \exp\left(g\left(\hat{\theta}\right)\right).\left(2\pi\right)^{h_m/2}\tilde{n}^{-h_m/2}\left(\det(I_{\theta=\hat{\theta}})\right)^{-\frac{1}{2}} \tag{A7}$$

Substituting (A1) at $\theta = \hat{\theta}$ into (A4) we get

$$\log\mu\left(D\,|\,m\right)=\log\mu\left(D\,|\,\hat{\theta},m\right)+\log\mu\left(\hat{\theta}\,|\,m\right)+\left(\frac{h_m}{2}\right)\log\left(2\pi\right)$$
$$-\frac{h_m}{2}\log(\tilde{n})-\frac{1}{2}\log(\det(I_{\theta=\hat{\theta}}))+O((\tilde{n})^{-1}) \qquad \text{(A8)}$$

Using Jeffrey's priors, $\mu\left(\hat{\theta}\,|\,m\right)\propto\left(\det(I_{\theta=\hat{\theta}})\right)^{1/2}$, equation (A5) simplifies to

$$\log\mu\left(D\,|\,m\right)=\log\mu\left(D\,|\,\hat{\theta},m\right)-\frac{h_m}{2}\log\left(\tilde{n}\right)+O((\tilde{n})^{-1}) \qquad \text{(A9)}$$

Finally, using the concentrated limited information log likelihood (see Davidson and McKinnon (1993), page 648) we get the following expression for the log of the integrated likelihood

$$\log\mu\left(D\,|\,m\right)=-\frac{\tilde{n}\left(k_m+1\right)}{2}\log\left(2\pi\right)-\frac{\tilde{n}}{2}\log\left(\det(\hat{\Omega}_m)\right)-\frac{h_m}{2}\log\left(\tilde{n}\right)+O((\tilde{n})^{-1}) \quad \text{(A10)}$$

which exponent corresponds to the hybrid LIBIC equivalent, $\hat{\mu}_{D,m}$, given in (5) in the text.

Data Appendix

Variable	Description	Source
Average Growth Rates of Real Per Capita GDP	Average growth rates for the periods 1965-74, 1975-84, and 1985-94.	Penn World Tables 6.1
Time Dummy Variables	Three dummy variables for 1965-74, 1975-84, and 1985-94.	
Regional Dummy Variables	A dummy variable for East Asia and a dummy variable for sub-Saharan.	
Initial Income	Logarithm of per capita GDP at 1965, 1975, and 1985. The instruments for initial income include the values at 1960, 1970, and 1980.	Penn World Tables 6.1
Population Growth Rates	Logarithm of average population growth rates plus 0.05 for the periods 1965-74, 1975-84, and 1985-94. The instruments for population growth rates include the average values of 1960-65, 1970-75, and 1980-85.	Ibid
Investment Share	Average ratios over each period of investment to GDP for the periods 1965-74, 1975-84, 1985-94. The instruments for investments include the average values of 1960-65, 1970-75, and 1980-85.	Ibid
Schooling	Years of male secondary and higher school attainment in 1965, 1975, and 1985.	Barro and Lee (2000)
Population Growth Rates	Logarithm of average population growth rates plus 0.05 for the periods 1965-74, 1975-84, and 1985-94. The instruments for population growth rates include the average values of 1960-65, 1970-75, and 1980-85.	Penn World Tables 6.1
1/ Life Expectancy at age 1	Reciprocals of life expectancy at age 1 in 1960, 1970, and 1980.	Barro and Lee (1994), World Bank
Log of Fertility Rate	The log of the total fertility rate in 1960, 1970, and 1980.	Barro and Lee (1994), World Bank, UNCDB
Openness (filtered)	Average ratios for each period of exports plus imports to GDP, filtered for the usual relation of this ratio to the logs of population and area for the periods 1965-74, 1975-84, and 1985-94. The instruments for this variable include the average values of 1960-65, 1970-75, and 1980-85.	Barro and McCleary (2003)
Government Consumption (net)	Average ratios for each period of government consumption (net of outlays on defense and education) to GDP.	Barro and Lee (1994), PWT61, GFS, SIPRI, UNESCO.
Change in Terms of Trade times Openness	The growth rate of the terms of trade over each period, interacted with the average ratio of exports plus imports to GDP.	Barro and Lee (1994), World Bank
Inflation	The consumer price inflation rate for the periods 1965-74, 1975-84, 1985-94.	Barro and Lee (1994), IFS, Global Development Network Growth Database.

Variable	Description	Source
Belief in Hell	Fraction of the population who believe in hell expressed in the form of $\log(x/1-x)$.	World Values Surveys (1981–1984, 1990–1993, 1995–1997) and International Social Survey Programme (1995 and 1998)
Belief in Heaven	Fraction of the population who believe in heaven expressed in the form of $\log(x/1-x)$.	Ibid
Monthly Church Attendance	Population averages of monthly church attendance expressed in the form of $\log(x/1-x)$.	Ibid
Buddhism	Buddhism share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion.	Ibid
Catholic	Catholic share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion.	World Christian Encyclopedia (1982)
Eastern Religion	Eastern Religion share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion. It includes Chinese Universists, Confucians, Neoreligionists, Shintos, and Zoroastrians (Parsis).	Ibid
Hindu	Hindu share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion. It includes Hindus, Jains and Sikhs.	Ibid
Jew	Jewish share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion.	Ibid
Muslim	Muslim share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion.	Ibid
Orthodox	Orthodox share in 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion.	Ibid
Other Religion	Other Religion share 1970 and 1980 expressed as a fraction of the population who expressed adherence to some religion.	Ibid
Protestant	Protestant share in 1970, 1980, and 1990 expressed as a fraction of the population who expressed adherence to some religion. It includes Protestants and Anglicans.	Ibid
KGATRSTR	Percentage of land area classified as tropical and subtropical via the in Koeppen-Geiger system.	The Center for International Development (CID) at Harvard University
LCR100km	Percentage of a country's land area within 100km of an ice- free coast.	The CID at Harvard University

Variable	Description	Source
Language	Measure of linguistic fractionalization based on data describing shares of languages spoken as "mother tongues".	Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat, and R. Wacziarg (2003)
Political Rights and Political Rights Square	We calculated the average for each period of the Freedom House measure of democracy and its square. Notice that the average of 1972-74 appears in the data.	Freedom House
Rule of Law	The average of the Political Risk Services indicator of the rule of law (the value for 1982 or 1985 appears in the first two periods	International Country Risk Guide
Expropriation Risk	Risk of "outright confiscation and forced nationalization" of property. Rescaled, from 0 to 1, with a higher score indicating less risk of expropriation. For the first two periods of our sample, we use the average value of expropriation risk for 1982-84. For the third and fourth periods of our sample we use the average value 1985-1994 and 1985-97, correspondingly.	International Country Risk Guide
Legal Formalism: Check	Index of formality in legal procedures for collecting on a bounced check, rescaled from 0 to 1.	World Bank at http://www.doingbusiness.org
Religious Pluralism	This variable is defined as one minus the Herfindahl index – i.e. the probability that two randomly selected persons from the population would belong to different religions. This index can, therefore, be viewed as an indicator of religious pluralism or diversity. Specifically, the Herfindahl index is the sum of the squares of the population fractions belonging to each of nine major categories: Buddhist, Catholic, Hindu, Jewish, Muslim, Protestant, other Eastern religions, Orthodox, and other religions. We calculate the religious pluralism in 1970 and 1980 (1990 for Poland).	
State Religion	A dummy variable that indicates the presence of state religion in 1970	Barro and McCleary (2003)
Stage Regulation of Religion	A dummy variable that indicates the presence of state regulation in religion in 1970.	Barro and McCleary (2003)
Ex Colony of Spain or Portugal	Coded zero or one. One indicates that country was colonized by Spain or Portugal.	Barro and Lee (1994),
English Legal Origin (or Common Law countries)	Coded zero or one. One indicates that country was colonized by Britain and English legal code was transferred.	La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2003).

Figure 1: Hierarchical Model Priors

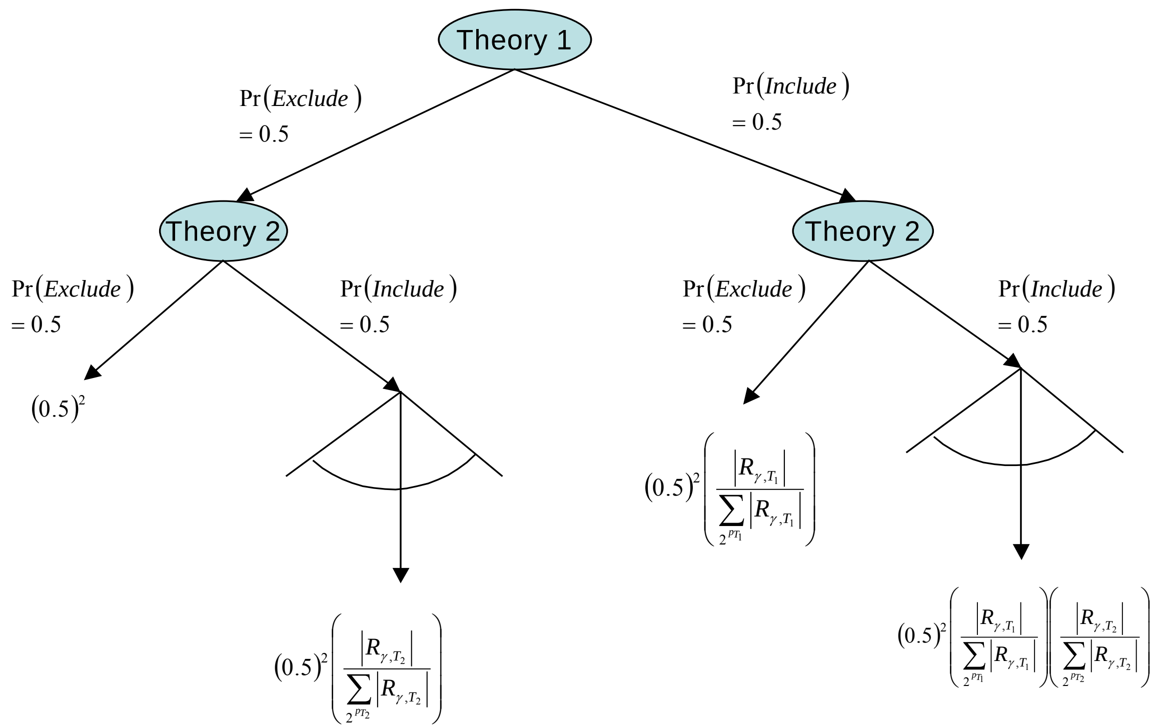

Table 1: List of Countries

Code	Country	Code	Country
	North America		*Asia and Oceania*
CAN	Canada	AUS	Australia
USA	United States	IND	India
		BGD	Bangladesh*
	Europe	JPN	Japan
AUT	Austria	KOR	Korea, Rep.
BEL	Belgium	NZL	New Zealand
CY	Cyprus‡	PHL	Philippines
CHE	Switzerland	TWN	Taiwan, China
DEU	Germany, Fed. Rep. (former)*,‡		
DNK	Denmark		*Sub-Saharan Africa*
ESP	Spain	GHA	Ghana
FIN	Finland	ZAF	South Africa*,‡
FRA	France		
GBR	United Kingdom		*Latin America & Caribbean*
HUN	Hungary*	ARG	Argentina
IRL	Ireland	BRA	Brazil
ISL	Iceland‡	CHL	Chile
ISR	Israel	DOM	Dominican Republic
ITA	Italy	MEX	Mexico
NLD	Netherlands	PER	Peru
NOR	Norway	URY	Uruguay‡
POL	Poland‡	VEN	Venezuela‡
PRT	Portugal		
SWE	Sweden		
TUR	Turkey		

Notes:

*In Barro and McCleary (2003) Bangladesh, Hungary, and Poland were dropped from the first period while Germany and South Africa were dropped from the third period.

‡ In our extended dataset adds Uruguay and Venezuela and drops Bangladesh, Cyprus, Germany, and Iceland from all three periods. Additionally, Poland was dropped from the first period and South Africa from the third period.

Table 2: Descriptive Statistics

Variable	Mean	Median	St. Dev.	Min.	Max.
East Asia	0.11110	0.00000	0.31573	0.00000	1.00000
Sub-Saharan Africa	0.04630	0.00000	0.21110	0.00000	1.00000
Average Growth Rates	0.02184	0.01916	0.01974	-0.02098	0.07864
Investments	0.22504	0.22290	0.06444	0.044800	0.37450
Schooling	2.11580	1.77100	1.30422	0.19400	5.9780
Initial Income	8.56522	8.71568	0.77955	6.62140	9.71534
1/ Life Expectancy at age 1	1.44483	1.38533	0.14140	1.30657	1.96941
Log of Fertility Rate	1.15628	1.05082	0.45017	0.43825	1.99470
Population growth Rates	-2.78022	-2.80616	0.14570	-3.06539	-2.48092
Openness (filtered)	-0.04213	-0.06195	0.17654	-0.47032	0.64087
Government Consumption (net)	0.07227	0.06495	0.04134	0.01000	0.23362
Change in Terms of Trade times Openness	-0.00290	-0.00264	0.01341	-0.05236	0.04734
Inflation	0.19376	0.08564	0.30464	0.01305	2.09233
Church Attendance	-0.36207	-0.40963	1.09993	-2.16432	2.09675
Belief in Hell	-0.57192	-0.45898	0.92632	-2.48382	1.75832
Belief in Heaven	0.50843	0.28033	0.99943	-1.43706	2.36583
Eastern Religion	0.06524	0.00000	0.22542	0.00000	0.96979
Hindu	0.02378	0.00000	0.13561	0.00000	0.827135
Jews	0.02920	0.00103	0.14670	0.00000	0.895643
Muslim	0.04163	0.00140	0.16485	0.00000	0.99299
Orthodox	0.00565	0.00201	0.00863	0.00000	0.03525
Other Religion	0.03564	0.00117	0.09363	0.00000	0.46940
Protestant	0.26133	0.03472	0.34640	0.00102	0.99595
LCR100km	0.60813	0.58210	0.31955	0.06325	1.00000
KGATRSTR	0.20300	0.00000	0.33765	0.00000	1.00000
Language	0.26552	0.15220	0.25130	0.00280	0.86520
Political Rights	0.77302	0.89420	0.27187	0.11666	1.00000
Political Rights Square	0.67079	0.79961	0.35652	0.01361	1.00000
Expropriation Risk	0.78119	0.85150	0.18187	0.31666	1.00000
Rule of Law	0.75470	0.83333	0.26923	0.16666	1.00000
Legal Formalism: Check	0.40274	0.35635	0.18219	0.09649	0.83479

Table 3: Replication of Table 4 in Barro and McCleary (2003)

Explanatory Variable	System 1	System 2	System 3	System 4	System 5	System 6
Religiosity	0.00003ϒ	0.00002ϒ	0.00009ϒ	0.00045ϒ	0.00013ϒ	0.00023ϒ
Monthly Church Attendance	-0.00828***	-0.01585***	-0.00883***	-0.01702***	-0.00813***	-0.01905***
	(0.00183)	(0.00341)	(0.00209)	(0.00442)	(0.00207)	(0.00453)
Belief in Hell	0.00659**	0.01527***	-	-	0.00696**	0.00918*
	(0.00263)	(0.00444)			(0.00352)	(0.00550)
Belief in Heaven	-	-	0.00534**	0.01460***	-0.00053	0.00942
			(0.00270)	(0.00514)	(0.00359)	(0.00631)
Religion Shares	-	0.00694ϒ	-	0.00212ϒ	-	0.00965ϒ
Eastern Religion Share	-	-0.00711	-	0.00345	-	-0.00552
		(0.00839)		(0.00803)		(0.00896)
Hindu Share	-	-0.01092	-	0.00612	-	0.00241
		(0.01174)		(0.01525)		(0.01547)
Jewish Share	-	-0.00264	-	0.00892	-	0.00198
		(0.00907)		(0.00875)		(0.00926)
Muslim Share	-	-0.03098**	-	-0.01400	-	-0.02909**
		(0.01223)		(0.00979)		(0.01254)
Orthodox Share	-	-0.02966	-	-0.02169	-	-0.03289
		(0.02044)		(0.01993)		(0.02091)
Protestant Share	-	-0.01661**	-	-0.02114**	-	-0.02144**
		(0.00698)		(0.00836)		(0.00868)
Other Religion Share	-	-0.01271	-	-0.02160	-	-0.02110
		(0.02087)		(0.02317)		(0.02240)
Number of observations for each time period	38,41,39	38,41,39	38,41,39	38,41,39	38,41,39	38,41,39

This table replicates the growth regressions in Barro and McCleary (2003; Table 4, page 773). The time periods are 1965– 1975, 1975–1985, and 1985–1995. Time dummies are included each period. The dependent variable is the growth rate of real per capita GDP over 1965–1975, 1975–1985, and 1985–1995. Other growth determinants were included but coefficients are not shown. The growth determinants not shown are the log of per capita GDP in 1965, 1975, and 1985; years of male secondary and higher school attainment in 1965, 1975, and 1985; reciprocal of life expectancy at age 1 in 1960, 1970, and 1980; average ratio over each period of investment to GDP; the log of the total fertility rate in 1960, 1970, and 1980; average ratios for each period of exports plus imports to GDP, filtered for the usual relation of this ratio to the logs of population and area; average ratios for each period of government consumption (net of outlays on defense and education) to GDP; the growth rate of the terms of trade over each period, interacted with the average ratio of exports plus imports to GDP; the average of the Political Risk Services indicator of the rule of law (the value for 1982 or 1985 appears in the first two equations); the average for each period of the Freedom House measure of political rights and its square; and the consumer price inflation rate for each period. The instrument list includes beginning of period or lagged values of all the covariates with the exception of church attendance, belief variables, and inflation. Inflation is instrumented with the Spain or Portuguese colonial dummy. The instruments for church attendance and belief variables are the dummy variables for state religion and state regulation of religion, and religious pluralism. Robust (White) standard errors are in parentheses. "***" denotes significance at 1%, "**" at 5%, and "*" at 10%. "ϒ" denotes joint p-value.

Table 4: MA and Classical Estimation Results for Growth Regression (Panel A)

	Bayesian Model Averaging Estimation					Classical Estimation	
Estimation Method	2SLS			LS		2SLS	LS
Criterion	LIBIC	BIC		BIC			
	Posterior Mean and Std. Error	Posterior Inclusion Probability	Posterior Mean and Std. Error	Posterior Inclusion Probability	Posterior Mean and Std. Error	Coefficient Estimate and Std. Error	Coefficient Estimate and Std. Error
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Religiosity		0.57130$^{\#}$		0.63565$^{\#}$		0.00034$^{\Upsilon}$	0.00678$^{\Upsilon}$
Belief in Heaven	-	0.00000	0.00000 (0.00005)	0.01136	-0.00003 (0.00033)	0.00383 (0.00515)	-0.00011 (0.00496)
Belief in Hell	-	0.00305	0.00000 (0.00044)	0.01022	0.00004 (0.00061)	0.01051** (0.00515)	0.00633 (0.00412)
Monthly Church Attendance	-	0.56935	-0.00285 (0.00347)	0.62208	-0.00272 (0.00242)	-0.01564*** (0.00365)	-0.00848** (0.00345)
Religion Shares		0.35433$^{\#}$		0.28416$^{\#}$		0.00066$^{\Upsilon}$	0.00183$^{\Upsilon}$
Eastern Religion Share	0.02851*** (0.00572)	0.34861	0.00621 (0.01092)	0.26515	0.00381 (0.00899)	-0.02183* (0.01292)	-0.01162 (0.01132)
Hindu Share	-	0.01014	-0.00006 (0.00123)	0.00759	0.00000 (0.00095)	-0.00394 (0.01746)	-0.01054 (0.01741)
Jewish Share	0.02610*** (0.00606)	0.34621	0.01028 (0.01473)	0.26397	0.00737 (0.01271)	-0.00344 (0.01048)	0.00828 (0.00992)
Muslim Share	-	0.01221	-0.00002 (0.00108)	0.01753	-0.00016 (0.002)	-0.05305*** (0.01145)	-0.03145*** (0.0094)
Orthodox Share	0.20044 (0.16503)	0.01619	-0.00172 (0.03132)	0.02088	-0.00306 (0.03103)	-0.69527*** (0.18570)	-0.39675*** (0.12336)
Protestant Share	-	0.01666	-0.00004 (0.00109)	0.02582	-0.00021 (0.00177)	-0.02162*** (0.00654)	-0.01426** (0.00573)
Other Religion Share	-	0.00952	-0.0001 (0.00174)	0.00922	-0.00008 (0.00171)	-0.04114* (0.02246)	-0.02984 (0.01879)
Neoclassical Growth		1.00000$^{\#}$		1.00000$^{\#}$		0.00000$^{\Upsilon}$	0.00000$^{\Upsilon}$
Initial Income	-0.01689*** (0.00282)	1.00000	-0.03080*** (0.00589)	1.00000	-0.02824*** (0.00475)	-0.03488*** (0.00494)	-0.02908*** (0.00427)
Investments	-	0.00954	0.00009 (0.00314)	0.00655	0.00011 (0.00291)	-0.01539 (0.02730)	-0.01926 (0.02500)
Schooling	-	0.61134	0.00172 (0.00167)	0.66345	0.00166 (0.00153)	0.00457*** (0.00147)	0.00316** (0.00138)
Population Growth	-	0.02301	-0.00042 (0.00387)	0.01565	-0.00035 (0.00338)	-0.01447 (0.02357)	-0.01792 (0.01930)

Table 4: MA and Classical Estimation Results for Growth Regression (Panel B)

	Bayesian Model Averaging Estimation					Classical Estimation	
Estimation Method	2SLS			LS		2SLS	LS
Criterion	LIBIC	BIC		BIC			
	Posterior Mean and Std. Error	Posterior Inclusion Probability	Posterior Mean and Std. Error	Posterior Inclusion Probability	Posterior Mean and Std. Error	Coefficient Estimate and Std. Error	Coefficient Estimate and Std. Error
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regional Heterogeneity		0.78667$^{\#}$		0.86751$^{\#}$		0.35794$^{\Upsilon}$	0.07052$^{\Upsilon}$
East Asia	-	0.78238	0.01075 (0.00772)	0.86551	0.01263* (0.00717)	0.01177 (0.00979)	0.01605* (0.00885)
Sub-Saharan Africa	-	0.00729	-0.00004 (0.00078)	0.00626	-0.00002 (0.00062)	-0.00324 (0.0119)	-0.00349 (0.0108)
Demography	-	0.92688$^{\#}$		0.96494$^{\#}$		0.01843$^{\Upsilon}$	0.09669$^{\Upsilon}$
1/ Life Expectancy at age 1	- -	0.91981	-0.07076** (0.03)	0.95938	-0.0563*** (0.0218)	-0.06979*** (0.02296)	-0.05172** (0.02199)
Log of Fertility Rate	-	0.02157	-0.00021 (0.00171)	0.01325	-0.00012 (0.00127)	-0.0062 (0.00871)	-0.00075 (0.00739)
Macroeconomic Policy		1.00000$^{\#}$		1.00000$^{\#}$		0.00000$^{\Upsilon}$	0.00000$^{\Upsilon}$
Openness (filtered)	0.02796*** (0.01058)	1.00000	0.03083*** (0.00956)	1.00000	0.02815*** (0.00783)	0.03381*** (0.00851)	0.03107*** (0.00745)
Government Consumption (net)	-	0.95799	-0.08457* (0.04634)	0.94515	-0.10157** (0.04442)	-0.06872 (0.05444)	-0.06534 (0.04768)
Change in Terms of Trade times Openness	- -	0.02514	0.00274 (0.02120)	0.02248	0.00219 (0.0185)	0.13594** (0.05757)	0.10908** (0.05347)
Inflation	-	0.98963	-0.01869** (0.00810)	0.99584	-0.01434*** (0.00417)	-0.02212*** (0.00562)	-0.01803*** (0.0043)
Geography	-	0.94742$^{\#}$		0.97425$^{\#}$		0.00023$^{\Upsilon}$	0.00000$^{\Upsilon}$
LCR100km	-	0.94594	-0.01584** (0.00622)	0.97363	-0.01357** (0.00508)	-0.02544*** (0.00556)	-0.02406*** (0.00449)
KGATRSTR	-	0.01843	-0.00010 (0.00106)	0.01306	-0.00007 (0.00089)	-0.00804 (0.00664)	-0.00577 (0.00591)

Table 4: MA and Classical Estimation Results for Growth Regression (Panel C)

	Bayesian Model Averaging Estimation					Classical Estimation	
Estimation Method	2SLS			LS		2SLS	LS
Criterion	LIBIC	BIC		BIC			
	Posterior Mean and Std. Error	Posterior Inclusion Probability	Posterior Mean and Std. Error	Posterior Inclusion Probability	Posterior Mean and Std. Error	Coefficient Estimate and Std. Error	Coefficient Estimate and Std. Error
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fractionalization		1.00000#		0.99998#		0.0531ϒ	0.00513ϒ
Language	-0.02607*** (0.00656)	1.00000	-0.02409*** (0.00737)	0.99998	-0.02267*** (0.00667)	-0.01533** (0.00722)	-0.02098*** (0.00679)
Political Institutions	-	0.00768#		0.0075#		0.93913ϒ	0.88691ϒ
Political Rights	- -	0.00395	0.00000 (0.00060)	0.00373	0.00000 (0.00045)	0.01026 (0.03019)	0.01704 (0.03189)
Political Rights Square	-	0.00372	-0.00001 (0.00056)	0.00377	-0.00001 (0.00042)	-0.00684 (0.02445)	-0.01358 (0.0262)
Property Rights Institutions		0.99968#		0.99866#		0.19264ϒ	0.04917ϒ
Expropriation Risk	0.05961*** (0.01186)	0.99968	0.04092*** (0.01435)	0.99863	0.04506*** (0.01158)	0.03878** (0.01966)	0.04611*** (0.01735)
Rule of Law	-	0.00311	-0.00004 (0.00111)	0.0038	-0.00005 (0.00123)	-0.01753 (0.01314)	-0.01398 (0.01237)
Contracting Institutions	-	0.13479#		0.16758#		0.00869ϒ	0.00707ϒ
Legal Formalism: Check	-	0.13479	-0.00098 (0.00579)	0.16758	-0.00149 (0.00488)	-0.03280*** (0.01134)	-0.02799*** (0.00942)

Table 4 shows the results for the growth regression, (equation (1) in text), using MA (columns (1)-(5)) and Classical estimation (columns (6)-(7)). Column (1) presents MA results based on a LIBIC criterion while columns (2)-(5) are based on BIC. Column (1)-(3) and (6) report 2SLS results while columns (4), (5), and (7) report LS results. The time periods are 1965–75, 1975–85, and 1985–95. Time dummies are included for each period. The dependent variable is the growth rate of real per capita GDP for each period. Following Barro and McCleary (2003) and Barro and Sala-i-Martin (2003) the instrument list includes the two regional dummies; real GDP per capita in 1960, 1970, and 1980; average ratios of investments to GDP and average population growth rates for 1960-65, 1970-75, and 1980-85; schooling in 1965, 1975, and 1985; reciprocal of life expectancy at age 1 in 1960, 1970, and 1980; log of the total fertility rate in 1969, 1970, and 1980; average ratio of exports plus imports to GDP (filtered) for 1960-65, 1970-75, and 1980-85; average ratios of (net) govt. consumption to GDP for 1965–75, 1975–85, and 1985–95; growth rate of the terms of trade over 1965–75, 1975–85, and 1985–95 interacted with the average ratio of exports plus imports to GDP; the Freedom House measure of political rights and its square in 1972, 1975, and 1985; lcr100km; KGATRSTR; Language; the average value of Expropriation Risk for the periods 1982-84 and 1985-94; Rule of Law in 1982 or 1985 and its average value for 1985-94. Inflation is instrumented with the Spain or Portugal colonial dummy. Religiosity variables are instrumented with the dummy variables for state religion, state regulation of religion, and religious pluralism. Religion shares are instrumented with value of the shares in 1970 (first two periods) and 1980 (third period). Contracting institutions are instrumented with British legal origin. Posterior robust (White) standard errors are in parentheses. "***" denotes significance at 1%, "**" at 5%, and "*" at 10%. "ϒ" denotes joint p-value while "#" denotes posterior probability of theory inclusion.

Table 5: Posterior Mode Models

	2SLS-LIBIC	2SLS-BIC	LS-BIC
	(1)	(2)	(3)
Posterior Mode Probability	1.000	0.467	0.500
Monthly Church Attendance	-	-0.00534* (0.00308)	-0.00441*** (0.00130)
Eastern Religion Share	0.02851*** (0.00572)	-	-
Jewish Share	0.02610*** (0.00606)	-	-
Orthodox Share	0.20044 (0.16503)	-	-
East Asia	-	0.01140*** (0.00435)	0.01248*** (0.00410)
Initial Income	-0.01689*** (0.00282)	-0.03439*** (0.00374)	-0.03069*** (0.00352)
Schooling	-	0.00285*** (0.00114)	0.00251** (0.00113)
1/ Life Expectancy at age 1		-0.07759*** (0.02178)	-0.05850*** (0.01776)
Openness (filtered)	0.02796*** (0.01058)	0.03216*** (0.00919)	0.02896*** (0.00739)
Government Consumption (net)	-	-0.10717*** (0.03529)	-0.12163*** (0.03177)
Inflation	-	-0.01856** (0.00747)	-0.01351*** (0.00365)
LCR100km	-	-0.01564*** (0.00435)	-0.01283*** (0.00393)
Language	-0.02607*** (0.00656)	-0.02099*** (0.00616)	-0.02028*** (0.00557)
Expropriation Risk	0.05961*** (0.01186)	0.03650*** (0.01200)	0.04330*** (0.01036)

This table shows the posterior models that correspond to the largest posterior model probability for all the models used in the three Bayesian Model Averaging exercises of Table 4. Column 1 shows the posterior mode model for 2SLS-LIBIC, column (2) shows the results 2SLS-BIC, and column (3) shows the results for LS-BIC. We report coefficient estimates and standard errors in parentheses. The time periods are 1965–75, 1975–85, and 1985–95. Time dummies are included for each period. The dependent variable is the growth rate of real per capita GDP over 1965–75, 1975–85, and 1985–95. Robust (White) standard errors are in parentheses. "***" denotes significance at 1%, "**" at 5%, and "*" at 10%.

Table 6: Robustness

Priors Information Criterion Always Kept	Hierarchical LIBIC Barro and McCleary (1)	Hierarchical LIBIC Religiosity (2)	Hierarchical LIBIC Religiosity and Shares (3)	Hierarchical LIBIC Neoclassical Growth (4)	Uniform LIBIC None (5)	Uniform BIC None (6)
Religiosity						
Belief in Heaven	0.02619 (0.02658)	0.02449 (0.04289)	0.17279 (0.28224)	-	-	0.00000 (0.00013)
Belief in Hell	-0.01230 (0.03833)	-0.00556 (0.02833)	-0.20831 (0.33970)	-	-	0.00005 (0.00136)
Monthly Church Attendance	-0.01703 (0.00920)	-0.02759 (0.04474)	0.00469 (0.03953)	0.00046 (0.00567)	-	-0.00218 (0.0034)
Religion Shares						
Eastern Religion Share	-0.00610 (0.01764)	-0.03499 (0.07563)	0.22283 (0.29776)	0.00784 (0.02960)	0.02851*** (0.00572)	0.00744 (0.01191)
Hindu Share	0.05722 (0.04261)	0.04811 (0.07565)	0.30469 (0.48031)	0.00384 (0.01093)	-	-0.0001 (0.00175)
Jewish Share	0.00913 (0.01401)	0.00169 (0.05080)	0.12680 (0.19159)	0.03011 (0.01867)	0.02610*** (0.00606)	0.02555** (0.01301)
Muslim Share	-0.01689 (0.03723)	-0.04704 (0.08576)	0.26237 (0.43295)	0.00215 (0.01919)	-	-0.00044 (0.00378)
Orthodox Share	-0.48774 (0.33971)	-0.87483 (1.01802)	-0.67726 (1.32371)	-0.24019 (0.30262)	0.20044 (0.16503)	-0.01741 (0.07866)
Protestant Share	-0.01852 (0.01425)	-0.04160 (0.06898)	-0.02347 (0.06738)	0.00102 (0.01884)	-	-0.00091 (0.00382)
Other Religion Share	-0.00508 (0.02896)	-	0.13618 (0.29629)	-	-	-0.00003 (0.00243)

This table presents the posterior means and std. errors for the coefficients of the religiosity variables and religion shares for seven different modeling averaging exercises for the growth regression described in equation (1) of the text. The time periods are 1965– 1975, 1975–1985, and 1985–1995. Time dummies are included for each period. The dependent variable is always the growth rate of real per capita GDP over 1965–1975, 1975–1985, and 1985–1995. For all the exercises other growth determinants were included but coefficients are not shown. In fact we used the same set of determinants and instruments as in table 4. Columns (1)-(4) and (7) refer to MA exercises using Hierarchical priors while exercises (5) and (6) refer to a MA exercise using Uniform priors. Exercise (6) employed the BIC approximation while exercise (7) employed the AIC criterion. Finally, columns (5)-(7) refer to MA exercises that allowed for model uncertainty for all the variables. Column (1) corresponds to the exercise that assumed that the specification of Barro and McCleary is always kept (included) in all the models considered in the MA. Column (2) assumed that the religiosity variables are always kept while column (3) assumed that both religiosity and shares are always kept. Column (4) assumed that the variables suggested by Solow (i.e. population growth, investments, schooling, and initial income) are always kept. Posterior robust (White) standard errors are in parentheses. "***" denotes significance at 1%, "**" at 5%,. and "*" at 10%.