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RELIGIOUS CONVERSION IN 40 COUNTRIES

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### **ABSTRACT**

Questions about current and prior religion adherence from the International Social Survey Program and the World Values Survey allow us to calculate country-level religious-conversion rates for 40 countries. These conversion rates apply to religion adherence classified into eight major types. In a theoretical model based on rational individual choice, the frequency of religious conversion depends on factors that influence the cost of switching and the cost of having the "wrong" religion. Empirical findings for a panel of countries accord with several hypotheses: religious-conversion rates are positively related to religious pluralism, gauged by adherence shares; negatively related to government restrictions on religious conversion; positively related to levels of education; and negatively related to a history of Communism. Conversion rates are not much related to per capita GDP, the presence of state religion, and the extent of religiosity. Effects from the type of religion adherence are minor, except for a negative effect from Muslim adherence. The empirical results are robust to alternative specifications of the religion groupings used to construct the conversion rates.

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Some countries, such as the United States, Australia, South Korea, and many sub-Saharan African countries currently have a great diversity of religion adherence. (See Barrett, Kurian, and Johnson [2001] for religion adherence data.) Others, such as Spain, Italy, the Scandinavian countries, and many majority Muslim countries have a heavy concentration within a single type. These concentrations are particularly striking if one ignores persons with no religion and considers only major religion categories (such as counting Muslim as one type). Aside from the within-country patterns, the data show wide differences internationally. Countries differ greatly in their adherence rates to the major world religions.

In the long run, the frequency distributions of religion types within and across countries reflect religious-conversion rates, along with cross-religion patterns of fertility, mortality, and migration. This study focuses on the conversion part of this relationship.

Historically, religious conversion often resulted involuntarily from conquest or changing preferences of rulers who restricted personal religion choices. For example, in central Europe, the rights of individuals to choose their own religion expanded greatly in 1648, when the Peace of Westphalia ended the Thirty Years' War. In contrast, in modern times, decisions to convert can usually be analyzed as an individual's decision about whether and when to switch. Conversion restrictions and other policies of governments and organized religions still apply in some countries, and these constraints affect personal choices. However, the most important influences on the conversion decision are the benefits and costs as perceived by individuals. Therefore, we use a rational-choice framework at the individual level to make predictions about the determinants of religious-conversion rates at the country level.

Empirical investigations of the determinants of religious conversion have typically focused on persons within a single country, often the United States (Stark and Glock [1968], Roof and McKinney [1987], Greeley [1989], Sandomirsky and Wilson [1990], Sherkat and Wilson [1995], Sherkat [2001], and Loveland [2003]). Breen and Hayes (1996) considered the United Kingdom, and Need and de Graaf (1996) analyzed the Netherlands. These studies are useful for assessing effects on the propensity to convert from variables such as age, gender, and race. However, given the context of a single country over a relatively short time period, these analyses cannot assess the effects of country-wide policies and characteristics, such as regulation of the religion market, political regimes such as Communism, and the extent of religious pluralism at the country level. Our panel of 40 countries allows us to examine in detail the effects of these kinds of policies and characteristics.

Section I discusses our procedures for using international survey data from International Social Survey Program (ISSP 1991 and 1998) and World Values Survey (WVS 2001) to estimate country averages of religious-conversion rates. Section II constructs a theoretical framework based on individual choice to consider determinants of country-level religious-conversion rates. Section III describes the setup of our empirical analysis. Section IV presents our empirical findings. Section V has summary observations.

## I. Survey Measures of Religious Conversion

The present analysis assesses the determinants of religious conversion across a broad sample of countries.<sup>1</sup> We use the waves on religion from the International Social Survey Program (ISSP) for 1991 and 1998 and the World Values Survey (WVS) around 2001 to measure and analyze religious-conversion rates in 40 countries. Our analysis focuses on country averages of conversion rates from the three surveys.

The underlying sample sizes for the two ISSP waves were typically between 1000 and 2000 persons per country, though larger samples applied in a few cases. The dating of the field work for the ISSP 1991 survey was in 1990 or 1991, except for 1993 for Australia. The ISSP 1998 survey applied mostly to 1996 or 1997, except for 1995 for Slovenia and 1998 for Switzerland. The ISSP provides good background information about the nature of the randomized sampling procedures used in the various country surveys. The WVS 2001 wave was similar to the ISSP in sample sizes, but samples of fewer than 1000 persons were collected in a few cases. The dating of the WVS surveys was between 1999 and 2002. The nature of the randomized sampling procedures for the WVS is less well documented than for the ISSP.

Iannaccone (2003) used the ISSP data to assess long-term trends in church attendance for 32 countries. He constructed these trends from retrospective questions concerning attendance rates for respondents and their parents when the respondents were aged 11 or 12. Because the respondents were surveyed around 1991 and 1998 at various

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<sup>1</sup> One previous cross-country analysis of religious conversion is Duke, Johnson, and Duke (1993). This study uses time series on religion adherence from Barrett (1982) to construct estimates of religious-conversion rates. The problem is that changes in the stock of adherents over time within a country reflect demographic factors (births, deaths, and international migration by religion type), as well as *net* changes due to religious conversion. It is not possible to use these data to get accurate estimates of gross flows due to religious conversion.

ages 16 and over, the retrospective questions provided information on church attendance for varying dates in the past.

Inspired by the Iannaccone approach, we use different retrospective questions from ISSP 1991 and 1998 and WVS 2001 to calculate religious-conversion rates. We use the questions that ask about a person's current and former religion adherence. The ISSP asks straightforwardly about a person's form of religion adherence currently and when being raised. The lists include an array of religion types as well as no religion.

The WVS questions are less well designed. People are first asked a yes-no question about whether they belong currently to a religious denomination. We use this question to determine the people who currently have no religion. Then the respondents are asked a separate question where they are supposed to select the current religious denomination, if any, from a list of types. A minor problem is that the total number designating a religion type in the second question does not quite correspond to the number saying that they belong to a religious denomination in the first question.

A more serious deficiency concerns former denomination. Persons who currently have no religious denomination were asked whether they were ever a member of a religious denomination. These answers allow us to match people who currently have no religion with their former status. Persons who currently are a member of a religious denomination were asked whether they were ever a member of another religious denomination. This question allows us to match up the current and former denomination for people who have two different denominations. The difficulty is that we cannot tell whether persons who say "no" in the second case were previously in the same religious denomination or had no religious denomination.

In any event, the ISSP and WVS information allows us to compute the number of persons whose current and former religious affiliations differ, if we consider persons with some religious adherence at both dates. Note that we observe only the religion at the time of the survey and the former time. Thus, from ISSP, differences between current and childhood religion imply that at least one religious conversion occurred between childhood and the current age. For WVS, a person who indicated ever having a former religion must have had at least one religious conversion at some point before the current age. We cannot detect multiple conversions in these data.<sup>2</sup>

In addition to calculating religion changes, we computed flows from some religion to none and no religion to some, subject to the difficulties already noted for the WVS information. However, these data pertain to overall religiousness and, therefore, to measures of religiosity considered in McCleary and Barro (2006) and other cross-country studies. Our present empirical investigation relates not to changes in overall religiosity but rather to shifts of affiliation among persons professing some kind of religion adherence.

We focus on movements across major religion groups, rather than less drastic switches of denomination within a major type, such as between forms of mainline Protestantism. To get a consistent sample from our three data sources (the two waves of the ISSP and the one wave of the WVS), we had to aggregate the underlying religion types to an eight-way classification: Catholic, Protestant, Muslim, Hindu, Eastern Religion (including Buddhist), Jewish, Orthodox, and Other Religion.

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<sup>2</sup> For the United States, the General Social Survey (GSS) religion module for 1988 asked questions about multiple religious conversions. Among persons with at least one change (by the time of the survey), 67% indicated one change, 25% two, and 8% three or more. These changes include movements into or out of no religion, as well as shifts within a major group, such as Protestantism.

The main difficulty in implementing the eight-way breakdown of religions consistently involves the Other Religion category. Depending on the level of detail used in each survey, “Other Religion” includes different sets of residual groups. A particular concern is that, in some of the underlying data, Other Christian includes independent Christian churches, which are likely to be largely evangelical, whereas in other data, most independent Christian churches are subsumed in the Protestant category. Since many religion transitions in recent years involve movements into independent Christian churches (from Protestant as well as other religions), this distinction is important for obtaining consistent estimates of conversion rates across data sets. We address these concerns by constructing alternative measures of conversion rates based on different groupings of the underlying religion types. We also consider a seven-way breakdown that excludes the Other Religion category entirely in the computation of conversions. We find that our main results are robust to these alternative classifications.

The ISSP and WVS surveys indicate the current age of the respondent, where persons aged 16 and over were included in the surveys. Therefore, if the current religious affiliation differs from the former affiliation, we know that a person currently of age A had a religious conversion sometime before age A. However, we do not know exactly when the transition occurred.

Previous research and data provide some information on when in a life cycle religious conversion typically takes place. Iannaccone (1990, pp. 301-302) finds that, among converts to Catholicism in the United States, about 85% converted before age 30.<sup>3</sup> The General Social Survey (GSS) religion module for 1988 indicates that, among persons

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<sup>3</sup>One difficulty is that the surveys include persons of various ages—converts who were young when surveyed could not possibly have converted when old. In addition, the conversions include shifts from no religion.

with at least one religion change, the breakdown of ages for a person's first change was 76% before age 30, 15% between 30 and 39, and 9% at 40 or over.<sup>4</sup> Need and de Graaf (1996, p. 93) find for the Netherlands that most people who leave the church act before age 30. However, this evidence applies to apostasy, not to conversion among types of religion.

The concentration of religious conversions at ages less than 30 is consistent with an important role for inter-marriage in the conversion process, as emphasized by Lehrer (1998) and Sherkat (2004). According to the GSS 1988 religion module for the United States, the reasons given for a person's first religion change break down into 37% mentioning marriage or family, 25% indicating friends or location, 18% citing issues of theology, and 19% giving other reasons. Thus, inter-marriage is likely to be an important but not overriding element in religious conversion at least in the United States.

To accord with the observed patterns by age, we focus our empirical analysis on religious-conversion rates applicable to persons aged 30 and over at the time of each survey. Thus, we concentrate on estimates of completed lifetime conversion rates; that is, rates that apply over the typical person's lifetime. However, our results are not very different if we look instead at the broader group of persons aged 16 and over at the sampling dates.

The total number of persons,  $T$ , surveyed in a given wave break down into those who, at an earlier time, adhered to various types of religions,  $R_1, R_2, \dots$ , and those expressing no religion adherence,  $N$ . For illustrative purposes, suppose that there are just two types of religions, so that

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<sup>4</sup>These data have the same issue of age sampling as that described in n. 3. Also, these GSS transitions include movements into or out of no religion, as well as switches within a major group, such as Protestantism.

$$(1) \quad T = R1 + R2 + N.$$

In comparing with current (survey-date) adherence, denoted by asterisks, nine transitions are possible:  $R1 \rightarrow R1^*$ ,  $R1 \rightarrow R2^*$ ,  $R1 \rightarrow N^*$ ,  $R2 \rightarrow R2^*$ ,  $R2 \rightarrow R1^*$ ,  $R2 \rightarrow N^*$ ,  $N \rightarrow N^*$ ,  $N \rightarrow R1^*$ , and  $N \rightarrow R2^*$ . We view religious conversion as comprising  $R1 \rightarrow R2^*$  and  $R2 \rightarrow R1^*$ . We look at the total of these two changes and do not distinguish between them. The tables that we construct provide information on apostasy,  $R1 \rightarrow N^*$  and  $R2 \rightarrow N^*$ , and religious rebirth,  $N \rightarrow R1^*$  and  $N \rightarrow R2^*$ , but we do not study these types of transitions in our statistical analysis.

Let  $\Delta R$  be the sum of the two types of religious conversions,  $R1 \rightarrow R2^*$  and  $R2 \rightarrow R1^*$ . Then the religious-conversion rate is the ratio of  $\Delta R$  to the total number of persons who began with some religion adherence,  $R1+R2$ :

$$(2) \quad \text{religious-conversion rate} = \Delta R / (R1 + R2).$$

In our analysis we use Eq. (2) to measure religious-conversion rates. However, we consider the eight categories of religion mentioned before, rather than two.<sup>5</sup>

Tables 1 and 2 describe the sample. The statistics pertain to respondents aged 30 and over for the countries in which the questions were asked that allow computation of religious-conversion rates. Table 1 has the breakdown of current religion adherence for the three survey waves into the eight religion types and no religion. The ISSP samples

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<sup>5</sup> We can implement Eq. (2) directly with the information given in the two ISSP waves. For the WVS wave, the wording of the questions allows us to determine the number of religion switchers,  $\Delta R$ , but, as noted before, not the breakdown of the total population between some and no religion at the earlier times. To estimate how the sample,  $T$ , breaks down into religiously adhering,  $R1+R2$ , and not adhering,  $N$ , at the earlier times, we need to know the fraction of the population with no religion adherence,  $N/T$ , during the various prior years. We estimated the  $N/T$  values by using population non-religion fractions from Barrett, Kurian, and Johnson (2001) for 2000 and 1970. First, we related the Barrett values for 2000 to those observed for the current survey date from the 2001 WVS. The correlation was high (0.75), but the WVS values for  $N/T$  were systematically higher than the Barrett values, by 0.12 on average. We therefore added 0.12 to the Barrett  $N/T$  data for 1970 to estimate the WVS non-religion fraction for the earlier dates. With these estimates, we can compute religious-conversion rates for WVS data from Eq. (2). Since the  $N/T$  values are much less than one, alternative estimates for these ratios tend not to have a large impact on computed religious-convergence rates.

are dominated by Christians—Catholic, Protestant, and Orthodox—but the 1998 survey has substantial Jewish representation. The WVS sample has relatively more Orthodox but still has little representation among Muslim, Hindu, and Eastern Religion. The Other Religion category is around 3% of the adhering population for all three surveys. The no-religion percentages are high, ranging from 21% for ISSP 1998 to 30% for WVS 2001.

Table 2 shows matrices of religion transitions for respondents aged 30 and over for the aggregate of countries included in each survey. Each row corresponds to a particular former religion, as shown in the left-most column. The next nine columns correspond to eight current religions or to no current religion. As an example, for ISSP 1998, among the 13,620 persons who had Catholic as their former religion (while being raised), 11,663 were still Catholic at the time of the survey, 264 were Protestant, 2 were Muslim, 1 was Hindu, 9 had Eastern Religion (including Buddhist), 10 were Jewish, 2 were Orthodox, 143 were in Other Religion, and 1526 had no religion adherence.

Table 2 also includes analogous information for ISSP 1991 and WVS 2001. However, as already noted (n.5), the wording of the WVS questions makes it difficult to fill-in all of the cells in the WVS religion-transition matrix. The notes to the table describe our procedures for estimating the numbers that cannot be computed directly from the survey answers.

Our cross-country analysis focuses on the country-wide religious-conversion rates shown by country and survey wave for persons aged 30 and over in columns 1-3 of Table 3. Among the 40 countries covered, 13 are in ISSP 1991, 29 in ISSP 1998, and 22 in WVS 2001. The conversion rates shown correspond to the structure of religion categories indicated by the transition matrices in Table 2.

Because of the ambiguities mentioned before in the categories “Protestant” and “Other Religion,” we also computed religious-conversion rates in two alternative ways. The first alternative re-labels any Christian groups contained in the other-religion category as Protestant. For example, for the WVS survey for Sweden, the alternative procedure classifies “Free Church/non-conformist/Evangelical” as Protestant, rather than Other Religion. This change eliminates most of the conversions recorded for Sweden in the WVS 2001 survey—the religious-conversion rate falls from 0.076, shown in Table 3, column 3, to 0.016. The principal other changes from the alternative method are for two cases in ISSP 1998: for Norway, the conversion rate falls from 0.031 to 0.002, and for New Zealand, the rate falls from 0.145 to 0.096.

The second alternative excludes the Other Religion category entirely, thereby labeling as religious conversions only transitions that involve the remaining seven religion types. That is, we excluded transitions that had Other Religion as the former or current affiliation. (In this alternative classification, we retained the Protestant category as defined in the original specification.) This second approach likely goes much too far in limiting changes recorded as conversions. As can be seen from Table 2, the total number of conversions falls from 1788 to 854—that is, 52% of the conversions are eliminated. In terms of conversion rates, the mean falls from 0.045 to 0.024 for ISSP 1991, from 0.050 to 0.024 for ISSP 1998, and from 0.023 to 0.009 for WVS 2001. Despite the large changes in levels of conversion rates, the patterns of religious conversion across countries remain similar—the correlation of the log of the revised conversion rates (with Other Religion excluded) with the original ones is 0.93 for ISSP 1991, 0.71 for ISSP 1998, and 0.62 for WVS 2001.

For the data in Table 3, the correlations of the logs of religious-conversion rates among countries sampled more than once are 0.81 between ISSP 1991 and ISSP 1998 (12 countries) and 0.63 between ISSP 1998 and WVS 2001 (also 12 countries). For ISSP 1991 and WVS 2001, the correlation is 0.96, but only 5 countries appear in both surveys. We have concerns about the reliability of the WVS information on religious conversion, partly because of shortcomings in the questions related to religion adherence (see n. 5 and notes to Table 2) and, more generally, because of ambiguities in the sampling procedures employed by the WVS.

For the 12 countries represented in ISSP 1998 and WVS 2001, the average conversion rates are 0.034 from ISSP 1998 and 0.022 from WVS 2001, with respective standard deviations of 0.033 and 0.022. Since we view the ISSP surveys as more accurate, we think that the WVS 2001 data systematically understate the extent and variability of conversion rates. Despite the problems with the WVS data, we are reluctant to drop these observations, because we think they provide incremental information. To retain all the data while addressing concerns about varying data quality across the surveys, we allow in the regression analysis for differences in intercepts and error-term variances for observations from the different survey waves.

The average religious-conversion rates, shown in Table 3, are 0.045 for ISSP 1991 (N=13), 0.050 for ISSP 1998 (N=29), and 0.023 for WVS 2001 (N=22). There is a substantial range of conversion rates across countries, as indicated by the respective standard deviations of 0.033, 0.050, and 0.019. The countries with conversion rates above 10% are Canada (17% in ISSP 1998), the United States (16% in ISSP 1998 and 12% in ISSP 1991), New Zealand (14% in ISSP 1998), and Chile (13% in ISSP 1998). Those

with conversion rates below 1% are Finland (0.2% in WVS), Romania (0.2% in WVS), Slovenia (0.3% in WVS, 0.6% in ISSP 1991, 0.7% in ISSP 1998), Bulgaria (0.2% in WVS and 0.4% in ISSP 1998), Spain (0.4% in ISSP 1998 and 0.6% in WVS), Italy (0.5% in WVS and 0.6% in ISSP 1991), Hungary (0.5% in ISSP 1991), Slovak Republic (0.6% in ISSP 1998), Cyprus (0.7% in ISSP 1998), and Poland (0.8% in ISSP 1998).

## II. Theoretical Framework

This section works out a simple theoretical model to provide a framework for the subsequent empirical analysis. We focus on hypotheses about the determinants of religious-conversion rates at the country level.

Suppose that  $m$  religion types exist in a country. If the religions can be ordered by a single characteristic, such as strictness, we can array the types  $z_i$  along a line at positions  $z_1, \dots, z_m$ , where one of these types can represent no religion. Differences between religion types are then represented by horizontal distances. Alternatively, the types could be arranged around a circle. In this case, the arc-distances measure differences between religions, but there is no sense in which any particular religion exhibits the lowest or highest amount of something like strictness. (We could also generalize to multiple religion characteristics.)

Individual  $j$  is “born” (corresponding, perhaps, to the end of dependent childhood at age 16) with religion adherence of type  $x_j$ . This type corresponds to one of the  $z_i$ . Let  $(x_j)^*$  represent person  $j$ ’s ideal type of religion at a point in time. Because religion preferences are shaped by family and neighborhood upbringing,  $x_j$  will typically be close to  $(x_j)^*$  at the time of “birth.” However, religion preferences,  $(x_j)^*$ , can change over time.

We assume that they evolve randomly, following a process with positive variance but no systematic trend. The variance of the random process is important for determining the frequency of religious conversion, but we assume in applications of the model that this variance is the same across time and place. Given this variance, the optimally determined frequency of religion switching will depend on two factors: the cost of switching and the cost of having  $x_j$  deviate from  $(x_j)^*$ . A higher switching cost results in a lower frequency of conversion, whereas a larger cost of deviation results in a higher frequency of conversion.

In the simplest setting, the cost of changing religion for person  $j$  is the lump-sum amount  $\gamma_j$ , independently of which religion pairs enter into the change. More realistically, this cost would depend on which pair of religions applies. For example, switches to neighboring religions will typically be less costly than movements to faraway religions. Moreover, some religions may have higher or lower costs of entering or leaving. In any case, the cost  $\gamma_j$  depends on individual and country-wide variables. At the individual level, one determinant of  $\gamma_j$  is education. More educated people likely find it easier to change religions because they are better at learning and adjusting to new ways of thinking. The better educated likely also have more information about alternative religions and more contact with people of other religions. At the country level, the switching cost depends on government regulations; for example, legal or religious restrictions on conversion raise  $\gamma_j$  for all persons  $j$  within the affected country.

The cost of having  $x_j$  deviate from  $(x_j)^*$  depends on the location of other available religions. For example, if  $x_j$  is a given distance from  $(x_j)^*$ , the benefit from switching will be greater the closer an alternative religion, one of the  $z_i$ , to  $(x_j)^*$ . The suitability of

alternative religions to the preferences of the typical individual tends to be greater the higher the density of the available religions in a country. The idea, as in Gruber (2005), is that the greater the concentration of the nearby population in a particular religion, the smaller the costs for each member to participate in that religion. Thus, the more pluralistic a country's religion market, the higher the typical benefit from making a switch—or, equivalently, the higher the cost of allowing one's current religion,  $x_j$ , to deviate from  $(x_j)^*$ .

The available religions in a country need not be fixed over time. For example, the rise of Evangelicalism in many places made it less costly for persons to belong to that faith. In the model, we could represent this change by introducing at some point in time a shift to a more pluralistic religion market. This kind of change would induce a large amount of religious conversion as a temporary response to the market innovation. Formally, we would predict that religious conversion would depend not only on the current level of religious pluralism (a steady-state effect) but also on past changes in the extent of this pluralism.

The cost of deviation from one's ideal religion type depends on how important formal religion is overall. That is, for given locations of available religions, the cost of a deviation of  $x_j$  from  $(x_j)^*$  will be greater the more important formal religion is to people. For example, our sample of 40 countries includes 14 that were formerly Communist (but none that were Communist at the time of the surveys). Communist governments sought to diminish the overall value attached to religious participation and beliefs (see, for example, Froese and Pfaff [2001]). To the extent that this political influence remains effective after the demise of Communism, the value of religion would be smaller and the

cost of deviations of  $x_j$  from  $(x_j)^*$  would be lower. In contrast, education has been argued to raise the benefits of religion through its networking role (Sacerdote and Glaeser [2001]). This effect implies that more education would raise the cost of a given deviation of  $x_j$  from  $(x_j)^*$ .

The secularization hypothesis argues that higher per capita income, which we gauge at the country level by real per capita GDP, lowers the demand for religion, measured by participation in formal services and religious beliefs. (See McCleary and Barro [2006] for an overview and cross-country empirical evidence.) From this perspective, higher per capita income would reduce the cost of a given deviation of  $x_j$  from  $(x_j)^*$ . However, although the evidence suggests that higher per capita income lowers religious participation and beliefs, an increase in per capita income need not reduce amounts spent per person on religion, and this spending variable is the relevant measure of the value placed on formal religion. Therefore, the predicted impact of per capita GDP on the cost of a given deviation of  $x_j$  from  $(x_j)^*$  is ambiguous.

Our theoretical framework is analogous to (S,s) models of inventory accumulation, as applied previously in many contexts. An individual who optimizes religion choices would allow  $(x_j)^*$  to evolve to some extent away from  $x_j$ . However, a sufficient deviation—that is, the attainment of a critical gap—triggers the payment of the lump-sum adjustment cost,  $\gamma_j$ , and the choice of a new religion,  $x_j$ , that is closer than the former one to the current  $(x_j)^*$ . The frequency of these changes in a country's overall population will be greater the lower the typical  $\gamma_j$  and the higher the typical cost of deviations of  $x_j$  from  $(x_j)^*$ . In our empirical analysis, we gauge the frequency of religion change by the fraction of the adhering population that undergoes a religious conversion

by age 30. Given the previous discussion, the model predicts that this conversion rate will be higher if:<sup>6</sup>

- a country has a higher level of religious pluralism,
- a country shifted recently toward greater religious pluralism,
- a country lacks religious and legal restrictions on conversion,
- a country lacks a history of Communism,
- a country has higher average educational attainment.

Higher per capita GDP has an ambiguous effect on the frequency of religious conversion.

We can augment the basic model to allow for inter-marriage. Marriage to a partner of a different religion tends to generate a jump in ideal religion type,  $(x_j)^*$ , at the time of marriage. That is, a spouse's strong incentive to match the partner's religion generates a lot of religious conversion around the time of inter-marriage. A deeper analysis would treat inter-marriage as endogenous, along the lines of Lehrer (1998), taking account of the costs of having different religions and of making shifts in religion adherence. For present purposes, an important point is that the incorporation of inter-marriage leaves intact the predictions worked out before for the determinants of the frequency of religious conversion.

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<sup>6</sup> An increase in the variance of the religion-preference shock raises the frequency of conversion for a given setting of the critical gap. However, a higher variance also motivates people to increase the size of the critical gap. This last response reduces the frequency of conversion. Typically, this second effect will only partially offset the first effect; that is, a higher variance of preferences results, on net, in a higher frequency of conversion. For a derivation in an analogous context (the frequency of price change when these changes entail lump-sum adjustment costs), see Barro (1972, Eq. [22]). This finding would add additional hypotheses to our list if we could identify variables that influence the variance of the religion-preference shock. However, we have not made progress in this direction.

### III. Setup of the Empirical Analysis

We use a regression system with three equations. The dependent variables are the logs of religious-conversion rates computed from ISSP 1991, ISSP 1998, and WVS 2001, as shown in Table 3.<sup>7</sup> Estimates are by the seemingly-unrelated technique, which allows the error variances to differ for the three samples and for the residuals to be correlated across survey waves for a given country. Each equation also has its own intercept, thereby allowing for differences across surveys in measured levels of conversion rates. Aside from the different intercepts, the coefficients of the explanatory variables are constrained to be the same across the three survey waves.

Table 4 shows means and standard deviations for the variables used in the regression systems. The first three columns apply to the regression samples, which are dictated mainly by the availability of the religious-conversion data. For comparison, the last three columns give means and standard deviations for much broader samples of countries. All means apply to unweighted samples; that is, each country receives the same weight irrespective of population, GDP, and so on.

The independent variables correspond to the hypotheses from the framework described before. The religious-pluralism variable is based on a breakdown of religion adherence for 1970 from Barrett, Kurian, and Johnson (2001); henceforth, referred to as Barrett. We use an eight-way breakdown of religion types, corresponding to the one we

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<sup>7</sup> The log form appropriately restricts the conversion rate to non-negative values. (No zero values occur in our main sample but do arise in several cases when we exclude Other Religion in the calculation of conversion rates. For the regressions with this alternative religious-conversion rate, we used the log of the conversion rate plus 0.001.) We could use a logistic form,  $\log[x/(1-x)]$ , where  $x$  is the conversion rate, to restrict the conversion rate not to exceed one. However, since all observed values of  $x$  are much less than one, the logistic form is nearly the same as the simpler log form that we use.

used for the ISSP and WVS surveys.<sup>8</sup> Barrett also provides information on the fraction of the population having no religion adherence.

The form of the pluralism variable is suggested by a religion-matching model, specifically a model of marriage between persons with differing religions. The variable corresponds to the probability that a randomly selected person with some religion adherence will, in a random encounter, meet a person with some, but differing, religion adherence. The first concept that we employ is one minus the usual Herfindahl index of religion shares among persons with some religion adherence. This Herfindahl measure—the sum of the squares of the religion-adherence shares—is appropriate if we think of persons with some religion randomly encountering other persons with some, but not necessarily the same, religion.

We also consider an alternative pluralism measure that takes account of persons with no religion. This measure applies if people with some religion randomly encounter other persons with some religion (either the same or different) or no religion. This measure depends partly on the composition of the adhering population across religions and partly on the fraction of persons with no religion. Given the distribution across religion types, the second variable is smaller than the first if the share of the population with no religion is positive.<sup>9</sup>

If we take account of assortative mating—persons of the same religion being more likely to match with each other—the probability of a religion mismatch could be

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<sup>8</sup> Some previous uses of the Barrett adherence data, such as McCleary and Barro (2006), included the category “other Christian,” which combines the Barrett categories of independent Christian churches, unaffiliated Christians, and “marginal Christians.” To approximate the ISSP-WVS eight-way scheme, we merged this other Christian category with Protestant and Anglican in the Barrett numbers.

<sup>9</sup> Let  $H$  be the Herfindahl index of religion concentration among persons with some religion adherence—that is, the sum of the squares of the religion population shares in the adhering population. Let  $n$  be the ratio of persons with no religion to the total adhering population. Then the alternative pluralism variable is given by  $(1-H)/(1+n)$ , which is declining with  $H$  and  $n$ .

substantially smaller than the number given by either of the religious-pluralism variables. However, the mismatch probability would still tend to be increasing with the pluralism variables that we use. The religious-conversion rate would, in turn, be increasing in the mismatch probability and, hence, with the pluralism variables. Although we motivated this linkage from inter-marriage, we would get the same result for other reasons. That is, aside from marriage considerations, a greater variety of religions available in a country would raise the rate of religious conversion—by making it less costly for persons to switch to alternative religions.

The theory suggests that religious conversion depends on past changes in religious pluralism, as well as the current level of pluralism. Based on the data from Barrett, Kurian, and Johnson (2001), we calculated the pluralism values for 1900, 1970, and 2000. Unfortunately, we lack information between 1900 and 1970. We can compute the change in pluralism between 1900 and 1970 but this change likely gives little information about the dynamics of pluralism that matter for our religious-conversion data—which pertain to conversions not too much prior to the survey dates around 1991, 1998, and 2001. We can also compute from the Barrett data changes in religious pluralism between 1970 and 2000 (or between 1970 and 1990), but these changes cannot be satisfactorily regarded as exogenous with respect to the religious-conversion rates that we calculated. Therefore, at this stage, we are not optimistic about our ability to isolate effects from past changes in religious pluralism on the observed conversion rates.

The dummy variable for legal restrictions on religious conversion comes from the Religion & State Data Set compiled by Fox and Sandler (2008). We use the information for 1990, the first year of their data, or for the earliest date available. Since their data

show strong persistence over time in these kinds of legal restrictions, the precise date is not critical.

Fox and Sandler provide four relevant indicators for legal restrictions that relate to religious conversion: those applying to conversion into minority religions, conversion out of the majority religion, proselytizing, and inter-faith marriage. However, none of the 40 countries in our religious-conversion sample have legal restrictions of the first two types. These direct restrictions on conversion tend to exist in predominantly Muslim countries.<sup>10</sup> Although the WVS 2001 wave contains many predominantly Muslim countries, the questions that allow calculation of the religious-conversion rate were not asked in any of these countries. We think this omission applies because residents of these countries would likely view a question about having a different religion earlier in life as insulting, especially when it pertains to an activity that is unlawful, as well as sinful. For the present analysis, we define our restrictions variable as a dummy that takes on the value one if the country had in place in 1990 (or a nearby date) restrictions on proselytizing or inter-faith marriage. (See Table 3 for the data.)

Real per capita GDP in 1990 is the value in 2000 U.S. dollars from version 6.2 of the Penn-World Tables (available online).<sup>11</sup> These data feature purchasing-power adjustments to compare standards of living across countries. Average years of school attainment in 1990 for the adult population aged 25 and over come from Barro and Lee (2001).<sup>12</sup> The dummy variables for Communist regime in 1970, having a state religion in 1970, and having government regulation of the religion market in the 1970s come from

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<sup>10</sup> Among 39 countries with Muslim adherence of at least 50%, 25 have conversion restrictions either out of the majority religion or into a minority religion. 18 have both types of restrictions.

<sup>11</sup> For Bulgaria and Lithuania, 1990 data were unavailable, and we used the values for 1995.

<sup>12</sup> For Croatia, we used the 1990 value for the former Yugoslavia. For Belarus and Ukraine, we used the 1990 value for Russia (which we took as representative of the former Soviet Union).

Barro and McCleary (2005). The regulation variable, an extension of Chaves and Cann (1992), was based on whether the government appointed or approved religious leaders. The results in McCleary and Barro (2006) showed that religious participation and beliefs were deterred by current and former Communism, encouraged by the presence of state religion (interpreted as a subsidy effect), and discouraged by government regulation of the religion market.

Data on monthly attendance at formal religious services, holding various religious beliefs, and self-classifying as a religious person come from the survey information given in various waves of the WVS, ISSP, and the Gallup Millennium Survey. These data are discussed in McCleary and Barro (2006). We use here the values from the 1990 WVS if these are available. Then we fill in, as available, numbers (adjusted for differences in average levels across surveys) from WVS 1981, ISSP 1991, WVS 1995, ISSP 1998, Gallup, and WVS 2001.

Table 4 makes clear some of the selection issues related to the availability of the religious-conversion data. The regression sample for religious conversion comprises countries that are substantially richer and more educated than the broad sample of countries. The regression sample is over-weighted toward former Communist countries. In terms of religion adherence, the regression sample is slanted toward Catholic, Protestant, Orthodox, and Jewish, and away from Muslim, Hindu, Eastern Religion (including Buddhist), and Other Religion. The regression sample also has over-representation of persons with no religion.

#### IV. Empirical Findings

Table 5, column 1 shows a baseline regression system for logs of religious-conversion rates from the three survey waves. Each of the three equations includes its own intercept. However, the estimated intercepts turn out not to differ significantly from each other ( $p$ -value = 0.24). The last two lines of the table show the fits of each equation, gauged by R-squared values and standard errors of estimation. The fits for the ISSP waves are similar, with R-squared values in excess of 0.7. That for the WVS wave is only 0.24; we think, again, because of the relatively poor quality of the data. Similarly, the standard error for the WVS equation is much higher than those for the ISSP equations.

As expected, the religious-pluralism variable for 1970 (calculated from adherence shares among the adhering population) has a significantly positive impact on the log of the conversion rate; the coefficient in Table 5, column 1 is 2.9 (s.e. = 0.5). This coefficient means that a one-standard-deviation increase in the religious-pluralism variable (by 0.19 in Table 4) raises the estimated log of the religious-convergence rate by 0.55. That is, at the sample mean conversion rate of 0.050 (for ISSP 1998), the estimated convergence rate would rise by about 70% to 0.087. Looking at Table 3, column 4, we see that low degrees of religious pluralism can explain why religious-conversion rates are particularly low in Spain, Finland, Italy, Poland, and Slovenia. In contrast, the high values of the pluralism variable in Canada and the United States help to explain high conversion rates.

If we add the change in the religious-pluralism variable from 1900 to 1970 to the regression system, this new variable has an estimated coefficient near zero. We think this

result applies because the measured change in pluralism is too far in the past to matter for our measured religious-conversion rates. Thus, at present, our results pertain to the long-term relation between the structure of religion adherence and religious-convergence rates, not to effects from changes in the adherence structure.

As expected, legal restrictions that deter religious conversion (involving proselytizing and inter-faith marriage) have a significantly negative effect on the log of the conversion rate, with a coefficient in Table 5, column 1 of -0.84 (s.e. = 0.21). The estimated coefficient implies that the implementation of a legal restriction (moving the dummy variable from zero to one) reduces the estimated conversion rate by nearly 60%—from 0.05 to 0.02 at the sample mean for ISSP 1998. The conversion restrictions that we recorded apply to 25% of the regression sample (see Tables 3 and 4). As noted before, the sample includes no predominantly Muslim countries, many of which have legal restrictions on religious conversion.

Religious conversion is significantly negatively related to former Communism, with a coefficient in Table 5, column 1 of -1.52 (s.e. = 0.20). Thus, the estimated effect is even larger in magnitude than that from conversion restrictions. The regression sample has 35% of the observations as former Communist (Table 4). Previous findings (McCleary and Barro [2006]) indicated that the influence of past Communism on religious participation and belief decayed over time but continued to be significantly negative after 10-15 years. (See also Inglehart and Baker [2000].) Our interpretation is that past Communism has a depressing influence on the value attached currently to formal religion and, thereby, diminishes the propensity for religious conversion.

The log of per capita GDP in 1990 has a negative but small and statistically insignificant effect on religious-conversion rates. The estimated coefficient in Table 5, column 1 is -0.09 (s.e. = 0.19). This result accords with the ambiguous effect noted before for the effect of higher per capita income on the value attached to formal religion.

In contrast, the variable for average years of school attainment of the adult population in 1990 has a significantly positive effect on religious-conversion rates, with a coefficient of 0.21 (s.e. = 0.05).<sup>13</sup> This coefficient implies that a one-standard-deviation increase in educational attainment (by 1.6 years in the regression sample, see Table 4) raises the estimated religious-conversion rate by about 40% (from 0.05 to 0.07 at the sample mean for ISSP 1998). Our interpretation of the education effect from the perspective of the theoretical framework is that more education reduces the cost of religious conversion and raises the benefit from formal religion—thereby, raising the propensity to convert on both counts.

Although per capita GDP and education are highly positively correlated, the results show that the sample has sufficient independent movement in these variables to distinguish the effects. The estimated positive impact of education on a country's religious-conversion rate accords with Loveland (2003, Table 2), who found a significantly positive effect from years of education on the probability of switching religions in U.S. data from the 1988 GSS religion module. As a related matter, Lehrer (1998, p. 255) and Sherkat (2004, p. 618) report positive effects of education on individual probabilities of inter-marriage in the United States.

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<sup>13</sup> If we break down total years of schooling into primary, secondary, and higher, the estimated coefficients in the system for religious-conversion rates are 0.19 (s.e. = 0.08) on primary, 0.23 (0.12) on secondary, and 0.28 (0.39) on higher. These results accord with the hypothesis that only total years of schooling matter (p-value = 0.92).

The results are not very different if we use the alternative definition of religious pluralism—the one discussed before that brings in an effect from the no-religion population. These results are in Table 6, column 1. The pattern of coefficient estimates is similar to that in Table 5, column 1, but the fits are somewhat poorer. We focus, henceforth, on the findings with the initial form of the pluralism variable.

Table 5, column 2 adds to the regression system two dummy variables concerning institutional aspects of religion—the presence of a state religion in 1970 and the presence of government regulation of religion in the 1970s. Although these variables were important in an earlier study for explaining religious participation and beliefs (McCleary and Barro [2006]), the two variables are individually and jointly statistically insignificant in the system for religious conversion ( $p$ -value = 0.20 for joint significance). This result makes sense because the system already includes a more directly relevant institutional measure, the presence of legal restrictions related to conversion.

We next added measures of religious participation and beliefs (applying typically around 1990). Conceptually, the effects of these variables on religious conversion are ambiguous. Greater participation and belief signify that formal religion is more important to a person, thereby suggesting a higher frequency of religious conversion. However, greater participation and belief also indicate a higher degree of satisfaction with and attachment to a person's incumbent religion and, thereby, predict a lower frequency of religious conversion. In any event, the estimated coefficients were insignificant when we used the extent of monthly or more attendance at formal religious services along with the extent of belief in hell, heaven, or an after-life, or whether people viewed themselves as religious. (Some of these variables were statistically significant for

explaining economic growth in Barro and McCleary [2003].) A representative finding appears in Table 5, column 3, which includes monthly attendance along with the extent of religiousness. The p-value for joint significance of these two variables is 0.70.

We also consider whether religious-conversion rates bear some relation to the composition of religion adherence (in 1970). Effects might arise here if religions differed by costs of joining or leaving or if religions differed by the degree of attachment of their members. Among the religion categories shown in Table 4, the only one that has significant explanatory power for religious-conversion rates is the fraction of the adhering population Muslim. Table 5, column 4 shows a marginally significant negative effect from the Muslim adherence share. The inclusion of this variable has little impact on the other results, except that the coefficient on the conversion-restriction variable becomes smaller in magnitude (but remains significant).

Table 6, columns 2 and 3, assesses the robustness of the results to alternative definitions of religious conversion. As noted before, we use alternative approaches concerning the treatments of the categories “Protestant” and “Other Religion” in the computation of religious-conversion rates.

Table 6, column 2 corresponds to the first alternative definition, in which all other Christian types are classified as Protestant, rather than Other Religion. The overall pattern of coefficient estimates is similar to that in the original specification (Table 5, column 1). The main change is the reduction in the coefficient for school attainment. The fits are also notably poorer than those in the initial specification. Thus, our preference is for the original specification, but the main inferences are robust to this alternative definition of conversion.

Table 6, column 3 corresponds to the second alternative definition, which eliminates all conversions associated with “Other Religion.” As noted before, this alternative roughly halves the religious-conversion rates, but the estimated rates remain substantially correlated with the original values. The regression coefficients show more differences from the original form (Table 5, column 1), but religious pluralism and school attainment remain significantly positive and Communism remains significantly negative. Two differences are that the conversion-restrictions variable is no longer statistically significant, whereas the log of per capita GDP becomes significantly negative at the 5% level. The fits of the equations—particularly for the ISSP waves—are notably poorer than those for the original specification. Thus, we prefer the original specification but nevertheless find it informative that the overall pattern of empirical estimates is robust to this drastic change in definition of religious conversion.

## **V. Summary observations**

We used retrospective questions about religion adherence from three international survey waves to construct country averages of religious-conversion rates. Our concept of conversion considers only shifts across major religion types, using a breakdown of religions into eight broad groups. The conversion rates for the population aged 30 and over vary substantially across countries, ranging from near zero for Spain, Italy, and many former Communist countries in Eastern Europe to over 10% in the United States, Canada, Chile, and New Zealand. Although our analysis focuses on switches among types of religions, the data also cover movements from religion to no religion and vice versa.

In a theoretical model, the frequency of religious conversion depends on factors that influence the cost of switching and the cost of having the “wrong” religion. These theoretical concepts suggested explanatory variables to use in our empirical analysis of country-level religious-conversion rates. We report several empirical findings that accord with the underlying theory: the religious-conversion rate is positively related to the extent of religious pluralism, gauged by the composition of adherence shares; negatively related to government restrictions that inhibit religious conversion; positively related to levels of education; and negatively related to a history of Communism. Given these variables, conversion rates were not much related to per capita GDP, the presence of state religion, and the extent of religiosity. The composition of religion adherence was mostly unimportant, except for a small negative effect from the Muslim adherence share. The empirical results were robust to alternative specifications of the religious-pluralism variable and to changes in the religion groupings used to construct the conversion rates.

In planning extensions of this research, we start with our view of religious conversion as one dimension of the fluidity of the religion market. Opportunities for conversion affect the degree of religious pluralism and the extent of competition among religion providers. Through these channels, religious-conversion rates should influence levels of religiosity, along the lines analyzed in McCleary and Barro (2006). In carrying out this extension, we will also use our data on switches between religion and no religion, as well as the movements between religions that we studied in this paper.

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<b>Table 1</b>						
<b>Current Religion Adherence in Religious-Conversion Sample (ages 30 and over)</b>						
	<b>ISSP 1991</b>		<b>ISSP 1998</b>		<b>WVS 2001</b>	
<b>Religion</b>	<b>Number</b>	<b>Percent of adhering</b>	<b>Number</b>	<b>Percent of adhering</b>	<b>Number</b>	<b>Percent of adhering</b>
<b>Catholic</b>	5716	47.5	11958	52.1	9192	54.3
<b>Protestant</b>	5198	43.2	6700	29.2	2998	17.7
<b>Muslim</b>	58	0.5	222	1.0	205	1.2
<b>Hindu</b>	10	0.1	11	0.0	6	0.0
<b>Eastern</b>	6	0.1	393	1.7	8	0.0
<b>Jewish</b>	36	0.3	755	3.3	29	0.2
<b>Orthodox</b>	699	5.8	2191	9.5	3936	23.3
<b>Other</b>	310	2.6	720	3.1	544	3.2
<b>Total adhering</b>	12033	100.0	22950	100.0	16918	100.0
<b>No religion</b>	4156	--	6130	--	7310*	--
<b>Total pop.</b>	16189	--	29080	--	24228	--
<b>No religion %</b>	--	25.7	--	21.1	--	30.2

Notes: ISSP is International Social Survey Program (1991 covers 1990-1993, 1998 covers 1998-2000). WVS 2001 is World Values Survey (covering 1999-2003). Eastern Religion has Buddhist and other eastern religions. Adhering percentages are relative to the adhering population. No religion percent is relative to the total population.

\*WVS 2001 has 24,390 respondents aged 30 and over, of which 7359 indicated no religion adherence and 17,031 indicated some religion adherence. In a separate question, only 16,918 persons (less than the 17,031) responded when asked which particular religion they adhered to. The number 7359 was scaled downward accordingly to 7310 in order to maintain the ratio of no to some religion indicated by the first question. This number, when added to 16918 gives the total population of 24,288, as shown in the table.

<b>Table 2 Matrices of Religious Conversions, aged 30 and over, all countries</b>										
<b>Former religion</b>	<b>Current religion</b>									<b>Total Former</b>
	<b>Catholic</b>	<b>Protestant</b>	<b>Muslim</b>	<b>Hindu</b>	<b>Eastern</b>	<b>Jewish</b>	<b>Orthodox</b>	<b>Other</b>	<b>None</b>	
<b>ISSP 1991</b>										
<b>Catholic</b>	5560	116	0	0	2	0	0	33	568	6279
<b>Protestant</b>	121	4941	2	0	0	3	1	127	1307	6502
<b>Muslim</b>	0	1	45	0	0	0	0	0	1	47
<b>Hindu</b>	0	0	0	10	0	0	0	1	0	11
<b>Eastern</b>	1	2	0	0	4	0	0	0	4	11
<b>Jewish</b>	0	0	6	0	0	32	0	0	8	46
<b>Orthodox</b>	2	1	0	0	0	0	269	10	37	319
<b>Other</b>	7	47	1	0	0	0	1	120	53	229
<b>None</b>	25	90	4	0	0	1	428	19	2178	2745
<b>Total Current</b>	5716	5198	58	10	6	36	699	310	4156	16189
<b>ISSP 1998</b>										
<b>Catholic</b>	11663	264	2	1	9	10	2	143	1526	13620
<b>Protestant</b>	117	6091	5	1	2	5	8	235	1311	7775
<b>Muslim</b>	2	0	205	0	0	0	5	1	10	223
<b>Hindu</b>	0	0	0	5	0	0	0	0	4	9
<b>Eastern</b>	0	0	0	0	312	0	0	5	37	354
<b>Jewish</b>	6	3	1	0	0	701	1	0	9	721
<b>Orthodox</b>	11	3	0	0	0	3	1556	17	65	1655
<b>Other</b>	22	58	0	4	10	4	0	209	124	431
<b>None</b>	137	281	9	0	60	32	619	110	3044	4292
<b>Total Current</b>	11958	6700	222	11	393	755	2191	720	6130	29080

<b>Table 2, continued</b>										
<b>Former religion</b>	<b>Current religion</b>									
	<b>Catholic</b>	<b>Protestant</b>	<b>Muslim</b>	<b>Hindu</b>	<b>Eastern</b>	<b>Jewish</b>	<b>Orthodox</b>	<b>Other</b>	<b>None</b>	<b>Total Former</b>
<b>WVS 2001</b>										
<b>Catholic</b>	8131*	41	2	1	0	1	20	69	1292	9557*
<b>Protestant</b>	32	2585*	0	0	1	0	5	43	598	3264*
<b>Muslim</b>	1	0	180*	0	0	0	0	0	7	188*
<b>Hindu</b>	0	1	0	4*	0	0	0	0	1	6*
<b>Eastern</b>	1	0	0	0	6*	0	1	0	0	8*
<b>Jewish</b>	0	0	0	0	0	23*	3	0	3	29*
<b>Orthodox</b>	13	10	1	0	0	1	3480*	15	66	3586*
<b>Other</b>	28	47	0	0	0	1	5	367*	75	523*
<b>None</b>	986*	314*	22*	1*	1*	3*	422*	50*	5128	7066*
<b>Total Current</b>	9192	2998	205	6	8	29	3936	544	7310	24228

Notes: Cells show numbers of each type of religion transition for persons currently aged 30 and over in the aggregate of the sampled countries for each of three survey waves: International Social Survey Program (ISSP) 1991 and 1998 and World Values Survey (WVS) 2001. The rows have former religions, as indicated in the left-most column, and the next nine columns show current religions. The breakdown is for eight religion groups plus no religion. The diagonals show numbers of persons who remained in their initial category. The text discusses why the questions in the WVS wave do not allow us to ascertain directly whether a person with a current religious affiliation had formerly the same or no religious affiliation. The affected cells are the ones indicated by asterisks. The text, n.5, describes how we estimated the total number of persons with no former religious affiliation (7066 in the right-most column). To approximate the remaining cells, we made a number of assumptions. To illustrate, for the Catholic column, we know from WVS the sum of the rows corresponding to formerly Catholic plus formerly none ( $9117 = 8131 + 986$ ). Our key assumption is that the ratio of those coming from none (estimated at 986) to the known total (9117) is the same for Catholic as it is for each other current religion (column for Protestant, etc.). These assumptions, together with our procedure for estimating the total former number for none (7066), allow us to fill in all the cells.

<b>Table 3 Religious-Conversion Rates and other Variables</b>							
	<b>Conversion rate</b>			<b>Religious Pluralism 1970</b>	<b>Religious Pluralism 1970 (alt.)</b>	<b>Conversion Restrictions 1990</b>	<b>Communist 1970</b>
	<b>ISSP 1991</b>	<b>ISSP 1998</b>	<b>WVS 2001</b>				
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>
<b>Australia</b>	0.054	--	--	0.43	0.41	0	0
<b>Austria</b>	0.034	0.019	0.020	0.17	0.16	0	0
<b>Belgium</b>	--	--	0.043	0.09	0.09	0	0
<b>Bulgaria</b>	--	0.004	0.002	0.28	0.21	1	1
<b>Belarus</b>	--	--	0.020	0.29	0.17	1	1
<b>Canada</b>	--	0.171	--	0.53	0.52	0	0
<b>Switzerland</b>	--	0.055	--	0.52	0.52	1	0
<b>Chile</b>	--	0.130	--	0.31	0.30	0	0
<b>Cyprus</b>	--	0.007	--	0.40	0.39	1	0
<b>Czech Republic</b>	--	0.024	0.013	0.40	0.33	0	1
<b>Denmark</b>	--	0.019	--	0.03	0.03	0	0
<b>Spain</b>	--	0.004	0.006	0.02	0.02	0	0
<b>Estonia</b>	--	--	0.024	0.53	0.25	0	1
<b>Finland</b>	--	--	0.005	0.03	0.03	1	0
<b>France</b>	--	0.018	0.020	0.14	0.13	1	0
<b>Germany (west)</b>	0.031	0.044	--	0.52	0.51	1	0
<b>U.K. (Britain)</b>	0.070	0.089	--	0.26	0.24	0	0
<b>Greece</b>	--	--	0.038	0.11	0.11	1	0
<b>Croatia</b>	--	--	0.010	0.22	0.21	0	1
<b>Hungary</b>	0.005	0.026	--	0.44	0.38	0	1
<b>Ireland</b>	--	0.019	--	0.17	0.17	0	0
<b>Iceland</b>	--	--	0.039	0.02	0.02	0	0
<b>Israel</b>	--	0.017	--	0.25	0.25	1	0
<b>Italy</b>	0.006	0.027	0.005	0.08	0.07	0	0
<b>Japan</b>	--	0.021	--	0.07	0.06	0	0
<b>Lithuania</b>	--	--	0.018	0.14	0.10	1	1
<b>Latvia</b>	--	0.084	0.039	0.67	0.35	0	1
<b>Netherlands</b>	0.077	0.092	0.044	0.51	0.46	0	0
<b>Norway</b>	0.032	0.031	--	0.00	0.00	0	0
<b>New Zealand</b>	0.070	0.145	--	0.29	0.28	0	0
<b>Philippines</b>	0.040	0.094	--	0.39	0.39	0	0
<b>Poland</b>	--	0.008	--	0.06	0.05	0	1
<b>Portugal</b>	--	0.024	0.020	0.10	0.09	0	0
<b>Romania</b>	--	--	0.002	0.31	0.26	0	1
<b>Russia</b>	0.036	0.085	0.012	0.60	0.29	0	1
<b>Slovak Republic</b>	--	0.006	--	0.32	0.28	0	1
<b>Slovenia</b>	0.006	0.007	0.003	0.09	0.08	0	1
<b>Sweden</b>	--	0.015	0.076	0.04	0.03	0	0
<b>Ukraine</b>	--	--	0.043	0.36	0.22	0	1
<b>United States</b>	0.120	0.159	--	0.45	0.43	0	0

### Note to Table 3

Religious-conversion rates are computed, as described in the text, from International Social Survey Program (ISSP) 1991 and 1998 and World Values Survey (WVS) 2001. Sources of other variables are in the notes to Table 4. The religious-pluralism variable in column 4 is  $1-H$ , where  $H$  is the sum of squares of religion-adherence shares among persons who adhere to some religion. This pluralism variable corresponds to the probability that a person meets a person with a different religion in a random encounter among persons with some religion. The alternative pluralism variable in column 5 takes account of non-religion. The formula is  $(1-H)/(1+n)$ , where  $1-H$  is the pluralism variable from column 4 and  $n$  is the ratio of persons with no religion to persons with some religion. This alternative variable gives the probability that a person with some religion meets a person with a different religion in a random encounter among persons selected from the entire population.

<b>Variable</b>	<b>regression sample</b>			<b>overall sample</b>		
	<b>N</b>	<b>mean</b>	<b>s.d.</b>	<b>N</b>	<b>mean</b>	<b>s.d.</b>
<b>Religious-conversion rate, ISSP 1991</b>	13	0.045	0.033	--	--	--
<b>Religious-conversion rate, ISSP 1998</b>	29	0.050	0.050	--	--	--
<b>Religious-conversion rate, WVS 2001</b>	22	0.023	0.019	--	--	--
<b>log(conversion rate, ISSP 1991)</b>	13	-3.48	1.05	--	--	--
<b>log(conversion rate, ISSP 1998)</b>	29	-3.55	1.13	--	--	--
<b>log(conversion rate, WVS 2001)</b>	22	-4.20	1.06	--	--	--
<b>Religious-pluralism indicator, 1970</b>	40	0.27	0.19	192	0.32	0.22
<b>Alternative pluralism indicator, 1970</b>	40	0.22	0.15	192	0.29	0.22
<b>Restrictions on conversion, 1990</b>	40	0.25	--	171	0.41	--
<b>Log (per capita GDP), 1990</b>	40	9.56	0.49	176	8.46	1.12
<b>Years of School Attainment, 1990</b>	40	8.83	1.58	119	5.63	2.98
<b>Communist, 1970</b>	40	0.35	--	190	0.18	--
<b>State religion, 1970</b>	40	0.30	--	189	0.39	--
<b>Regulation of religion, 1970s</b>	40	0.40	--	171	0.34	--
<b>Monthly church attendance, 1990, ...</b>	40	0.31	0.21	87	0.40	0.25
<b>Belief in hell, 1990, ...</b>	40	0.29	0.17	81	0.43	0.27
<b>Belief in heaven, 1990, ...</b>	40	0.47	0.22	81	0.59	0.27
<b>Belief in after-life, 1990, ...</b>	40	0.51	0.19	82	0.58	0.23
<b>Religious person, 1990, ...</b>	40	0.63	0.18	79	0.69	0.19
<b>Barrett religion shares, 1970:</b>						
<b>Catholic</b>	40	0.433	0.397	192	0.309	0.365
<b>Protestant</b>	40	0.323	0.355	192	0.216	0.291
<b>Orthodox</b>	40	0.168	0.308	192	0.070	0.201
<b>Jewish</b>	40	0.027	0.136	192	0.007	0.062
<b>Muslim</b>	40	0.020	0.046	192	0.232	0.358
<b>Hindu</b>	40	0.000	0.001	192	0.022	0.104
<b>Eastern Religion (including Buddhist)</b>	40	0.025	0.153	192	0.067	0.214
<b>Other Religion</b>	40	0.004	0.006	192	0.079	0.159
<b>Non-religion share of total population</b>	40	0.123	0.148	192	0.074	0.155

#### Notes to Table 4

These variables are used in the regressions shown in Tables 5 and 6. The sample of 40 countries comprises those, aside from East Germany (which is missing other data), with religious-conversion data. Means are unweighted averages across the countries. The religion shares are fractions of the adhering population in each country. The Protestant category includes Anglican, independent Christian churches, unaffiliated Christians, and “marginal Christians.”

Sources: Religious-conversion rates, shown in Table 3 and discussed in the text, are from ISSP 1991, ISSP 1998, and WVS 2001. Religion-adherence shares among the adhering population and non-religion fractions are from Barrett, Kurian, and Johnson (2001). Pluralism indicators are calculated from these shares, as described in the notes to Table 3 and the text. The dummy variable for restrictions on religious conversion (restrictions on proselytizing or inter-faith marriage) is from Fox and Sandler (2008). Real per capita GDP is from Penn-World Tables version 6.2 (available online). School attainment is from Barro and Lee (2001). Dummy variables for Communism, state religion, and regulation of religion are from Barro and McCleary (2005). Church-attendance rates (for monthly or greater attendance) and frequencies of religious beliefs and religiousness are from various waves of ISSP, WVS, and the Gallup Millennium Survey (see the text).

<b>Table 5 Regressions for Logs of Religious-Conversion Rates</b>				
<b>(persons aged 30 and over, 40 countries, 3 survey waves)</b>				
<b>Independent variables</b>	<b>Coefficients (standard errors in parentheses)</b>			
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
<b>Religious pluralism, 1970</b>	2.91** (0.46)	2.68** (0.54)	2.92** (0.46)	3.17** (0.47)
<b>Restrictions on conversion, 1990</b>	-0.84** (0.21)	-0.87** (0.21)	-0.88** (0.22)	-0.66** (0.22)
<b>Communist, 1970</b>	-1.52** (0.20)	-1.76** (0.25)	-1.61** (0.23)	-1.47** (0.21)
<b>log (per capita GDP), 1990</b>	-0.09 (0.19)	-0.14 (0.20)	-0.20 (0.22)	-0.20 (0.20)
<b>School attainment, 1990</b>	0.208** (0.052)	0.185** (0.053)	0.200** (0.053)	0.211** (0.053)
<b>State religion, 1970</b>	--	-0.34 (0.28)	--	--
<b>Regulation of religion, 1970s</b>	--	0.35 (0.20)	--	--
<b>Monthly church attendance, 1990 ...</b>	--	--	-0.52 (0.71)	--
<b>Religious person, 1990 ...</b>	--	--	0.19 (0.77)	--
<b>Muslim adherence share, Barrett, 1970</b>	--	--	--	-4.0* (1.9)
<b>R-squared</b>	.80, .72, .24	.75, .75, .31	.80, .72, .23	.74, .75, .33
<b>standard error of residuals</b>	.45, .58, .90	.50, .55 .86	.44, .58, .90	.52, .55, .85

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

Notes: The system of three equations is for logs of religious-conversion rates from ISSP 1991 (N=13), ISSP 1998 (N=29), and WVS 2001 (N=22). 40 countries appear at least once. Estimation is by the seemingly-unrelated (SUR) technique. Separate constant terms, not shown, enter into each equation. For the variables shown, the coefficients were constrained to be the same in each equation. The religious-conversion rates are the ones in Table 3, columns 1-3. The religious-pluralism variable is the one in Table 3, column 4.

<b>Table 6 Regressions for Logs of Religious-Conversion Rates: Robustness Checks</b>			
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
	<b>alternate pluralism variable</b>	<b>conversion rate with all other Christian as Protestant</b>	<b>conversion rate with other religion excluded</b>
<b>Religious pluralism, 1970</b>	2.96** (0.61)	3.48** (0.53)	4.10** (0.60)
<b>Restrictions on conversion, 1990</b>	-0.86** (0.23)	-0.78** (0.24)	-0.09 (0.26)
<b>Communist, 1970</b>	-1.23** (0.22)	-1.43** (0.23)	-1.68** (0.27)
<b>log (per capita GDP), 1990</b>	-0.09 (0.21)	-0.10 (0.22)	-0.59* (0.25)
<b>School attainment, 1990</b>	0.242** (0.056)	0.126* (0.060)	0.209** (0.069)
<b>R-squared</b>	.76, .64, .23	.70, .65, .14	.74, .60, .17
<b>standard error of residuals</b>	.49, .66, .91	.57, .70, .94	.77, .79 .89

Notes: Column (1) differs from Table 5, column 1, in the definition of the religious-pluralism variable as the one in Table 3, column 5, rather than column 4. Column (2) differs from Table 5, column 1, in the change of the dependent variable to calculate religious-conversion rates by treating all Other Christian as Protestant, rather than Other Religion. Column (3) differs from Table 5, column 1, in the change of the dependent variable to calculate religious-conversion rates by omitting all conversions that involve the category Other Religion. The flow  $\Delta R$  then omits changes in which the origin or destination was Other Religion. In this case, the denominator, the total of persons starting with some religious adherence, also omits persons categorized as Other Religion.