Religiosity and Growth Revisited: Estimating a Causal Effect*

Jean Francois Carpantier† Anastasia Litina‡

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Abstract

Exploiting variations in the inherited component of religiosity of migrants currently residing in the US, this research uncovers the casual effect of religiosity on the standard of living. The analysis establishes that religiosity at the country of origin has a long lasting effect on the religiosity of migrants. Using a panel of countries for the period 1935-2000 and exploiting the inherited religiosity of migrants, the empirical findings suggest that i) church attendance has a positive impact on economic outcomes; ii) religious beliefs in the existence of god, hell, heaven and miracles have no effect on economic outcomes, and iii) stronger faith is associated with prosperity. Notably, the positive effect of religious participation and of stronger faith on economic outcomes operates via the creation of social capital and the development of traits such as hard work that are conducive to growth.

Keywords: Religiosity, Growth, Beliefs, Migration, Culture

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†University of Luxembourg, Faculty of Law, Economics and Finance, 148, Avenue de la Faiencerie, L - 1511 Luxembourg (e-mail: Jean-Francois.carpantier@uni.lu)

‡University of Luxembourg, Faculty of Law, Economics and Finance, 148, Avenue de la Faiencerie, L - 1511 Luxembourg (e-mail: anastasia.litina@uni.lu)

1 Introduction

The profound effect of religiosity on economic outcomes has long been debated, however the associated literature is still inconclusive as to the direction and more importantly the causality of this effect.

This research uncovers the causal effect of religiosity on growth by exploiting variations in the inherited component of religiosity of migrants currently residing in the US. The analysis first establishes that religiosity at the country of origin has a long lasting effect on the religiosity of migrants. Using as a proxy of religiosity the inherited religiosity of migrants and employing a panel of countries for the period 1935-2000, the empirical findings suggest that i) church attendance has a positive impact on economic outcomes; ii) religious beliefs in the existence of god, hell, heaven and miracles have no effect on economic outcomes, and iii) stronger faith is associated with higher growth. Notably, the positive effect of religious participation and of stronger faith on economic outcomes operates only via the creation of social capital and the development of traits such as fairness and hard work that are conducive to growth.

The major challenge of this research is to establish a causal effect. To obtain a truly exogenous measure of religiosity the analysis implements an intuitive method developed by Algan and Cahuc (2010). Following their methodology, we exploit variations in the religiosity of migrants in the US as derived from the General Social Survey (GSS). The dataset spans from 1972 till 2012 and comprises information about migrants from 25 countries all over the world (Europe, Africa, India and Mexico). The first critical aspect of this approach is that in this sample of migrants their forbears migrated in the US at different dates, e.g. two different cohorts of migrants from a source country can be detected whose forebears migrated before 1935 and 2000 respectively and the same is true for all other ethnic groups. The second crucial aspect is that there is a range of cultural traits, e.g. religiosity, trust or fertility attitudes, that are transmitted across generations and can thus be detected in the current responses of migrants.[1] Exploiting these two aspects, allows us to obtain time varying measures of inherited religiosity from migrants whose forebears migrated in the US in different time periods. The estimated measure of inherited religiosity can then be employed as a proxy of contemporaneous religiosity to estimate the impact of religion on economic outcomes. This ensures that the measure of inherited religiosity is not only time varying but also exogenous, addressing both concerns of unobserved heterogeneity and omitted variable bias.

The GSS sample provides multiple questions on religiosity. We are primarily interested in three broad categories of variables in line with the related literature, i.e. i) church participation, ii) beliefs, and iii) intensity of religiosity. Moreover the variables used should satisfy two

[1] See e.g. Guiso et al. (2006) for the role of culture, Algan and Cahuc (2010) for the transmission of trust, Giuliano (2007) for living arrangements in Western Europe, Alesina and Giuliano (2010) for the role of family in influencing economic behavior and attitudes, Fernández and Fogli (2009) for fertility and Bentzen (2013) for religiousness of 2nd generation migrants.

main criteria. The first important criterion is to use only the variables for which a large number of individual answers is available, so as to ensure that the estimated religiosity outcome is representative of the mean attitude of each corresponding ethnic group. Second, it is critical to establish that these variables manifest an inherited component with respect to religiosity. To explore whether this criterion is satisfied, we correlate each proxy of inherited religiosity with the corresponding current measures of religiosity. This approach not only reinforces the claim that inherited religiosity of migrants is a good proxy for current religiosity in the origin country, but it also mitigates concerns about the potential selection of migrants.[2] Overall seven variables satisfy all criteria, i.e. church attendance, participation in religious activities, belief in god, hell, heaven, miracles and intensity of religiosity.

These seven exogenous proxies of current religiosity are then employed in a panel of countries for the period 1935-2000 to establish a causal effect of each aspect of religiosity on economic outcomes. Reassuringly the analysis controls for country and year fixed effects as well as a number of time varying factors thereby controlling for most of the unobserved heterogeneity. Furthermore we explore the channels through which religiosity operates, via accounting for education, individual traits conducive to growth and social capital. Our findings suggest that several aspects of religiosity (church participation and strength of faith) are affecting economic outcomes, however this effect operates via the channels of social capital and of individual traits conducive to growth. As far as beliefs are concerned we do not find any significant effect.

Our paper contributes to a growing body of sociological and economic literature on religiosity. There have been two major waves in the study of religion. The first wave has originally started with the influential studies of Marx (1904), Weber (1905), Smith (1863)

and continued with Azzi and Ehrenberg (1975)and Berger (2011) . The notions of modernization, secularization, Protestant ethic and the spirit of capitalism have long dominated the public debate. The analysis of religiosity at the time was more in the realm of ideas and less on their empirical exploration. It has not been until much later that the original debate triggered the second wave in the study of religion that comprises numerous empirical and theoretical explorations of the existing ideas. The second wave covers an extensive literature that explores and quantifies all aspects of religiosity, quite often with rather conflicting results.

Of all these facets of religion, the question of interest in the current study is the effect of religiosity on economic growth. Three major approaches have been adopted to study this issue.

[2]Had selection been an issue it would have been difficult to positively correlate inherited religiosity of migrants with current religiosity at the country of origin. Moreover the selection issue is further mitigated by excluding from the analysis the sample of first generation migrants (Luttmer and Singhal, 2011).

The first approach, primarily represented by Barro and McCleary (2003, 2006)[3], has exploited variations in religiosity across countries to explore the effect of religious beliefs and church participation on economic outcomes. Their findings suggest that higher church attendance and higher participation in religious activities, for a given level of beliefs, is associated with lower growth rates. Interestingly though, when it comes to religious beliefs, in particular belief in hell, heaven and post-life, stronger beliefs are positively associated with economic growth, thereby highlighting the distinction between believing and belonging. Their results are confirmed across a number of different samples, exploiting variations in religiosity both at the country and at the individual level. In order to establish a causal effect between religiosity and growth, they use as instruments the measure of official state religion, government regulation and religious pluralism. These results, while critical in highlighting the importance of religion, have been subject to criticism related to the robustness to different specifications as well as criticism on whether their instruments satisfy the exclusion restriction (Young, 2009; Durlauf et al., 2012). In particular Durlauf et al. (2012) argue that once using Bayesian methods to account for model uncertainty, they find that the main results of Barro and McCleary (2003) on attendance and beliefs do not survive under any specification.

The second approach attempted to overcome some of the difficulties encountered in the cross country analysis by using individual level data and associating individual religiosity with a number of traits that can be conducive to growth, such as attitudes towards cooperation, women, government, legal rules, fairness and thriftiness (see e.g. Guiso et al. (2003)). The idea behind this approach was to indirectly link religiosity to growth via its effect on these individual traits. Once this link is established, the link to growth is assumed to be straightforward. Moreover, this approach allowed to control for a number of individual characteristics, country and time fixed effects, thereby taking care of much of the unobserved heterogeneity and resolving partly the specification problem. However, as the authors acknowledge, in the presence of omitted variable bias their results do not suggest a causal effect and are interpreted as mere correlations. Moreover this approach does not provide a direct link from religiosity to growth. Whereas the presence of cultural traits that are conducive to growth suggests a positive effect of religiosity on growth, other forces related to religiosity may interact as well that are not captured by this approach.

The third approach intensifies the efforts to address the major issue of endogeneity by resorting to religion or country specific studies and exploiting different types of natural experiments. Becker and Woessman (2009) exploiting a wealth of data from Prussia establish that the Weberian thesis operated only through its effect on human capital. Cantoni (2011) explores the same hypothesis using data from the German Lands of the Holy Roman Empire and finds no effects of Protestantism on economic growth. Andersen et al. (2011) confirm

[3]Other important contributions in the field are Barro (1997); La Porta et al. (1999); Fernandez et al. (2001).

the arguments of Weber (1905) that Protestant ethic enhanced growth and investment via enhancing thrift and hard work. Clingingsmith et al. (2009) explore the impact on pilgrims of performing the Hajj pilgrimage to Mecca, while Campante and Yanagizawa-Drott (2013) exploit exogenous variations in the length of fasting period during the Ramadan due to the rotating Islamic calendar, to suggest that whereas longer Ramadan fasting adversely affects output growth in Muslim countries, nevertheless it is positively associated with subjective well-being. The strength of these papers lies in their identification and in the use of new sources of current and historical data. The main limitation of this approach is that their results are not applicable for a general notion of religiosity and are confined to the analysis of specific religions and historical periods.

The current paper employs the technique developed in Algan and Cahuc (2010) to explore the effect of religiosity on growth, while addressing some of the shortcomings of the existing literature. Exploiting the natural experiment of migration in the US and a wealth of survey data from the General Social Survey, we contribute to the literature in four distinct ways: i) we address the issue of endogeneity, ii) we not only establish a direct link between religiosity and economic outcomes but we can also capture the effect of several aspects of religiosity, iii) we explore the intermediate channels via which religiosity operates, and iv) we document empirically the hereditary component of religiosity.

Our findings confirm that indeed several aspects of religiosity are conducive to growth. Starting with church participation, the literature has documented two opposing forces via which church participation affects growth. The first force, identified by Barro and McCleary (2003, 2006) is that for a given level of beliefs, higher attendance is associated with lower growth due to being a non-productive activity. The counter-argument though is that higher attendance is associated with higher level of social capital (see e.g. Putnam (2000); Glaeser and Sacerdote (2008)), which is widely acknowledged to be positively correlated with growth (Putnam et al., 1993; Algan and Cahuc, 2010). We establish that the dominating effect of church participation on growth is positive and that the effect becomes insignificant, and the coefficient even negative, when we control for trust and for individual traits such as hard work and fairness. This shows that trust and individual traits conducive to growth are the main channels relating church attendance to growth.

Similarly, with respect to beliefs Guiso et al. (2003) have suggested that religiosity is associated with certain traits, such as thrift and honesty, that are conducive to growth. Nevertheless, certain beliefs may as well advance intolerance and religious discrimination that can be detrimental for growth (Campante and Yanagizawa-Drott, 2013; Clingingsmith et al., 2009). The role of human capital is also quite critical, since some religious denominations are associated with higher levels of human capital relative to others, implying a differential effect on economic outcomes (Becker and Woessman, 2009; Botticini and Eckstein, 2005). In the presence of all these opposing forces the overall effect of beliefs on growth can be inconclusive.

Our findings suggest that beliefs have no effect on economic outcomes, not even after netting out the effect of education, trust and individual traits.

Finally, our analysis reveals that a stronger intensity of faith is associated with higher growth. Netting out the effect of education and trust does not affect the significance of our results suggesting that stronger faith is potentially an internal process not necessarily associated with social interactions. However once we control for individual traits this effect dissipates as well.

The results are robust to a number of different assumptions and specifications. Whereas all time invariant characteristics are controlled for via using country fixed effect, we also control for some time varying variables that could be associated with growth. Moreover, the results are robust to different variants in the sample of migrants employed in the analysis, to different time frames and different specifications of both stages of the analysis.

In Section 2, we analyze the empirical strategy adopted, the methodology for the selection of the religiosity variables and describe analytically the GSS sample of migrants. Section 3 presents the results of the benchmark analysis as well as the intermediate mechanisms via which religiosity affects economic outcomes. Section 4 establishes the robustness of the results. Finally, Section 5 concludes.

2 Empirical Strategy and Data

2.1 The Data

Identifying the Sample of Migrants The data on religiosity are derived from the General Social Survey (GSS) dataset. The GSS spans over the period 1972-2012 and is conducted annually. The survey provides information as to the ethnic origin of the participating individuals. The purpose of the analysis is to keep only migrants whose forebears have migrated in the US. In particular we can trace migrants from 32 current or former countries and continents. In particular the set of countries is Austria, Belgium, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Ireland, Italy, Japan, Lithuania, Mexico, the Netherlands, Norway, Philippines, Poland, Portugal, Puerto Rico, Russia, Spain, Sweden, Switzerland, Great Britain and Yugoslavia. Moreover Africa is part of the sample (denoting all migrants of African origin) as well as Arabic countries. Table 1 shows the number of migrants coming from each country.

The main religions represented in our sample are Protestants (16,045), Catholics (7,168), Jewish (485), Christians (270) and None (2,860) which includes atheists or people not belonging to a religious group. Other religious groups are represented as well, however they comprise only a small fraction of the sample. Table 2 provides detailed information about the religious affiliation of the respondents.

TABLE 1: Countries of Origin of the 2nd, 3rd and 4th Generation Migrants

Family Origin	Frequency	Family Origin	Frequency
Africa	3,194	Japan	62
Arab Countries	31	Lithuania	91
Austria	151	Mexico	772
Belgium	58	Netherlands	502
Canada	514	Norway	592
China	48	Philippines	35
Czech Rep.	396	Poland	882
Denmark	233	Portugal	85
Finland	144	Puerto Rico	219
France	651	Romania	35
Germany	5,682	Russia	410
Greece	112	Spain	235
Hungary	154	Sweden	557
India	36	Switzerland	140
Ireland	4,116	UK	5,516
Italy	1,764	Yugoslavia	121
Total		27,463	

Summary: The table lists the countries of origin for the sample of second, third and fourth generation migrants, as well as the number of migrants coming from each source country.

TABLE 2: The Effect of Religiosity on Income per Capita-Protestants

Religious Preference	Frequency	%
Protestant	16,045	58.42
Catholic	7,168	26.1
Jewish	485	1.77
None	2,860	10.41
Other	428	1.56
Buddhism	62	0.23
Hinduism	5	0.02
Other eastern	11	0.04
Muslim/Islam	24	0.09
Orthodox-Christian	31	0.11
Christian	279	1.02
Native American	3	0.01
Inter-nondenominational	62	0.23
Total	27,463	100

Summary: The table lists the religious denominations of the second, third and fourth generation migrants, as well as the number of individuals belonging to each denomination.

The next step is to keep all second, third and fourth generation migrants as the reference sample. First generation migrants are excluded from the sample so as to mitigate any selection and endogeneity concerns. In order to distinguish among generations of migrants, the question on the origin of a migrant's parents and grandparents is used. The question on parents' origin is ranked as follows: 0 if both parents of the migrant are born in the US, 1 if only the mother was born in the US and 2 if only the migrant's father was born in the US. The use of this variable allows to trace migrants up to the second generation. To extend the analysis to a sample that comprises third generation migrants, the question on the grand parents birth place is used. Analytically, the variable takes the value of 0 if all grandparents were born in the US, the value 1 if at least one was born outside the US, 2 if two were born outside the US, 3 if three were born outside the US and 4 if all four grandparents were born outside the US. The combination of these two variables allows us to trace migrants up to four generations. First generation migrants are the ones who were born elsewhere and are currently residing in the US. Second generation migrants are those who were born in the US and at least one parent was born abroad and all grandparents were born abroad. Third generation migrants are those who were born in the US, whose parents were born in the US and at least two grand parents were born abroad. Fourth generation migrants are those whose parents were born in the US and who have maximum one grandparent born abroad or all grandparents born in the US but who declare to have at least one ancestor from abroad. Identifying the four generations of migrants allows us to identify the cultural transmission of the religiosity traits across generations.

Religiosity Variables The analysis employs eight religiosity variables that belong to three broader categories: i) Church Attendance, ii) Religious Beliefs, and iii) Intensity of Religiosity. The category of church participation comprises two variables, "Attendance" and "Member of a Church". Religious beliefs include belief in "God", "Hell", "Heaven", "Miracles" and "Post-life". Finally, the third category comprises the variable "Near God" capturing how close one feels to god.[4]

Analytically the variables are the following: i) The first variable is denoted Attendance". The question is "How often r[5] attends religious services?" and the variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; ii) The second variable is being a member of the church, denoted by "Church Member". The variable is binary with 0 denoting "Yes" and 1 denoting "No"; iii) Belief in the existence of God, denoted by "God". The question is "r's confidence in the existence of God?" and the variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; iv) Belief in hell, denoted by "Hell". The question is "Belief in Hell" and the variable

[4]The selection process of the variables is described in the following section.

[5]The "r" in GSS questions stands for respondent.

takes values from 0 to 3, with 3 denoting " Yes definitely" and 0 denoting "No, definitely not"; v) Belief in heaven denoted by "Heaven". The question is "Belief in Heaven" and the variable takes values from 0 to 3, with 3 denoting " Yes definitely" and 0 denoting "No, definitely not"; vi) Belief in miracles denoted by "Miracles". The variable takes values from 0 to 3, with 3 denoting " Yes definitely" and 0 denoting "No, definitely not"; vii) Belief in life after death denoted by "Postlife". The variable is binary taking the value 2 for "Yes" and the value 1 for "No"; viii) Intensity of religious faith denoted by "Feel Close to God". The question is "How close does r feel to god" and the variable takes values from 0 to 4 with 4 denoting "extremely close" and 0 denoting "does not believe".[6]

Channel Variables For each religiosity proxy, we will explore whether the effects on growth are due to the typical channels of interaction (social capital, education and individual traits conducive to growth). All measures are derived from the relevant GSS questions. The measure of social capital is "Trust" and is constructed from the question on how much people can be trusted (higher values imply more trust). The questions are detailed in the Appendix C1.

Economic outcomes are measured using income per capita (constant 2000 US dollars). To construct the data, the updated Maddison dataset is used (Bolt and van Zanden, 2013).

Institutions are measured using the POLITY IV dataset.

2.2 Empirical Strategy

The empirical section of the paper is developed in two parts. In the first part (Micro Part) the estimated measures of inherited religiosity are obtained. In the second part (Macro Part) the estimated measures of inherited religiosity are used as proxies for contemporaneous religiosity and the effect of religiosity on economic outcomes is estimated, using a panel comprising two dates, i.e. the year T1=1935 and the year T2=2000.

2.2.1 Micro Part

This section builds upon the GSS sample of migrants to construct the measures of inherited religiosity. The GSS survey, spanning over the period 1972-2012 comprises 200 questions on many different aspects of religiosity. We are primarily interested in three broad categories of variables in line with the related literature, i.e. i) church participation variables, ii) beliefs, and iii) intensity of religiosity. Importantly we use questions that have a large number of observations as this ensures that the estimated proxy of religiosity will be representative of

[6]The variables (iv)-(viii) have been redefined so that higher values indicate stronger beliefs. This approach has been adopted so as to simplify the analysis and the interpretation of the results.

the average level of religiosity for both cohorts of each ethnic group. As already described in the data section we end up with eight variables that capture several aspects of religiosity.

Upon choosing the proper variables the analysis proceeds in three stages:

Stage 1 In order to construct two point values for our panel dataset it is important to construct proxies of religiosity for the years 1935 and 2000. To mitigate endogeneity concerns we want to regress contemporaneous outcomes on lagged values of religiosity. We choose the lag between religiosity and outcomes to be 25 years. Therefore the purpose is to construct the corresponding measures of religiosity for the years T1-25=1910 and T2-25=1975.

In order to construct the measure of inherited religiosity with a lag of 25 years, we need to estimate religious cultural traits that have been transmitted before the period T1-25 (and T2-25 correspondingly). To do that we will exploit variations in religiosity of members of the three generations of migrants (second, third and fourth generation migrants), while assuming that the gap between two consecutive generations is 25 years. In particular we will estimate the inherited component of religiosity of: i) second generation migrants born before T1-25 (and T2-25). The reason for choosing this lag is to ensure that their parents arrived in the US before 1910 (1975). In this absence this information, we use as a proxy their date of birth, therefore we use migrants who were born before T1-25=1910 (T2-25=1975); ii) Third generation migrants whose grand parents came in the country before 1910 (1975). As a proxy for that we use the date of birth of the migrants. Assuming that a generation lasts for 25 years, this implies that we use individuals who were born before T1-25+25=1935 (similarly for T2); iii) Fourth generation migrants whose great grand parents migrated in the US before 1910 (1975). As a proxy we use again the date of birth of these migrants which should be before T1-25+50=1960 (similarly for T2).

Crucially we have to make sure that these two groups of migrants, all coming from the GSS survey should not overlap. Therefore for the cohort of migrants that we'll use to estimate the 1935 inherited religiosity (henceforth 1935 cohort) we use the following rules: i) Second generation migrants born before 1910 ($X_2 < 1910$), ii) Third generation migrants born before 1935 ($X_3 < 1935$), and iv) Fourth generation migrants born before 1960 ($X_4 < 1960$). Similarly for the 2000 cohort we ll use i) $1910 < X_2 < 1975$, ii) $1935 < X_3 < 2000$ and iii) $1960 < X_4 < 2025$.

Each migrant is assumed to carry with him the religiosity traits of his country of origin, transmitted to him via his ancestors, i.e. inherited religiosity in 1935 (2000) is the one estimated using the sample of second, third and fourth generation migrants whose ancestors migrated to the US at least one generation before 1935 (2000).

Tables A.1 and A.2 of the appendix show how migrants are split between the two groups.

Stage 2 After forming the two cohorts, we estimate a country-specific religiosity measure separately for the sub-samples of the 1935 and 2000 cohorts. In particular we estimate the following equation:

$$REL_{ijr} = \alpha_i + \beta Z_j + \gamma_r + \varepsilon_{ij} \tag{1}$$

where REL_{ijr} is a religiosity measure[7] specific to the survey respondent j coming from country i who was interviewed in the GSS round r. α_i is the country of origin fixed effect, Z_j a vector of individual specific control variables (age, age square, gender, employment status) and γ_r is a dummy variable for the round of the GSS survey in which the respondent participated. The estimated value of α_i will be the cohort- and country-specific measure of religiosity that will be used in the macro analysis.

Crucially, eq. (1) is important for the exploration of the channels through which religiosity operates. In order to explore the various channels (e.g. beliefs, traits such as honesty or thrift) the analysis introduces these additional controls as part of the vector Z_j. The reason for introducing these channels in the micro part of the analysis is that it allows us to sustain the same degrees of freedom in the macro part of the analysis. This is crucial since the panel sample is already quite limited (max 25 countries).

Analytically, to explore the channel through which religiosity operates, we would redefine the vector Z_j as follows:

$$Z_j = (\text{age}, \text{age square}, \text{gender}, \text{employment status}, \text{channel}^*) \tag{2}$$

where the variable channel* will either be "education", "trust", or individual traits such as "hard work", "help others" or "fairness".

As an example, if we control for individual educational level, we net out the effect of education in our analysis. The newly estimated value of α_i will then be the cohort and country specific measure of religiosity, cleaned from education effect, that will be used in the macro analysis of the channels via which religiosity affects growth.

Stage 3 It is quite critical to establish that the estimated measures of religiosity indeed manifest heritability and that they are good proxies for religiosity. To this purpose we first show correlations between estimated inherited religiosity in 1935 with the estimated inherited religiosity in 2000 and second, we show correlations between the estimated measures of inherited religiosity in 2000 with current measures of religiosity from the WVS (as measured directly in the country of origin). Our correlations suggest that seven out of the eight variables are good proxies of current religiosity, with inherited belief in postlife not being a good proxy for current belief in post-life.

[7] In other words, REL_{ijr} is the answer of individual j to one of the 8 GSS questions related to religiosity.

2.2.2 Macro Part

In this section we use a panel over the period 1935-2000 to estimate the effect of religiosity on income per capita. We estimate the following equation:

$$GDP_{it} = \alpha' REL_{it} + \beta' X_{it} + \gamma_i + \delta_t + \varepsilon'_{it} \quad t = 1935, \ \ 2000$$

where GDP_{it} is the GDP level in country i in year t, REL_{it} is the inherited religiosity measure (α_i from the micro part), X_{it} is the initial GDP (level of GDP in $t-70$), γ_i denotes country fixed effects and δ_t denotes year fixed-effects.

Therefore the analysis exploits within country variation to establish the effect of religiosity on growth thereby accounting for omitted variable bias that are constant at the country level. Moreover by using the proxied values of inherited religiosity, constructed with a 25 years lag, instead of actual religiosity measures we resolve the issue of reverse causality. Finally to take care of unobservables that vary over time the robustness section of the paper introduces some time varying controls.

All the eight measures of religiosity are explored and used to build alternative proxies of REL_{ijr}.

3 Empirical Findings

This section first explores the inherited component of religiosity, then empirically examines the effect of religiosity on economic outcomes.

3.1 Inherited Religiosity

To construct the measure of inherited religiosity, and check its validity, a three stage screening process is employed.

Choice of variables As described in the previous section after eliminating variables that do not belong to the three broader categories relevant for the literature and the variables that have less than 20 observations for each country we end up with eight variables: i) Church participation ("Church Attendance" and "Member of a Church") ii) Beliefs in "God", "Hell", "Heaven", "Miracles" and "Post-life", and iii) Intensity of religiosity ("Near God").[8]

Estimating the religiosity fixed effects for the years 1935-2000 and reporting their between correlation. Tables B.1 and B.2 in Appendix B report the OLS estimations of inherited religiosity for the periods 1935 and 2000, as estimated by Equation 1. The analysis

[8] Our results are robust to different threshold levels as well. See the robustness section of the paper.

TABLE 3: Correlation Between the 1935 and 2000 Inherited Religiosity Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Religiosity 2000							
	Attend	Church Member	God	Hell	Heaven	Miracles	Postlife	Near God
Relig. 1935	0.547***	0.136	0.262***	0.593***	0.475***	0.350**	0.313***	0.242
	(0.108)	(0.107)	(0.0703)	(0.186)	(0.122)	(0.128)	(0.0610)	(0.181)
R-sq.	30	25	26	15	14	15	28	21
Obs	0.480	0.066	0.366	0.439	0.559	0.367	0.504	0.085

Summary:The tables reports the regression coefficients between the estimated inherited religiosity measures for the 1935 cohort and the 2000 cohort. The coefficient is positive for all eight measures. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

controls for individual characteristics such as age, age square, gender, income, working status and GSS round fixed effects to capture potential unobservables associated with the year that the respondent participated in the survey. The standard errors are clustered at the country of origin dimension.

The results suggest that for most aspects of religiosity, older people tend to be more religious, highly educated people manifest lower levels of religiosity, women are more religious, whereas income and working status are in most cases insignificant. Crucially, for the vast majority of the proxies of religiosity the country of origin is a significant determinant, suggesting that certain religious traits can be culturally transmitted. Moreover, religiosity has evolved over time, without indicating though whether secularization has taken place or not.

Figure 1 correlates the 1935-2000 estimated fixed effects, whereas Table 3 reports the regression coefficients of religiosity 2000 on religiosity 1935. Reassuringly for all variables the correlation between 1935 and 2000 religiosity measure is positive and in most cases highly significant. Even for the variables "Church Member" and "Near God" the correlation is quite high despite not being significant at conventional levels.

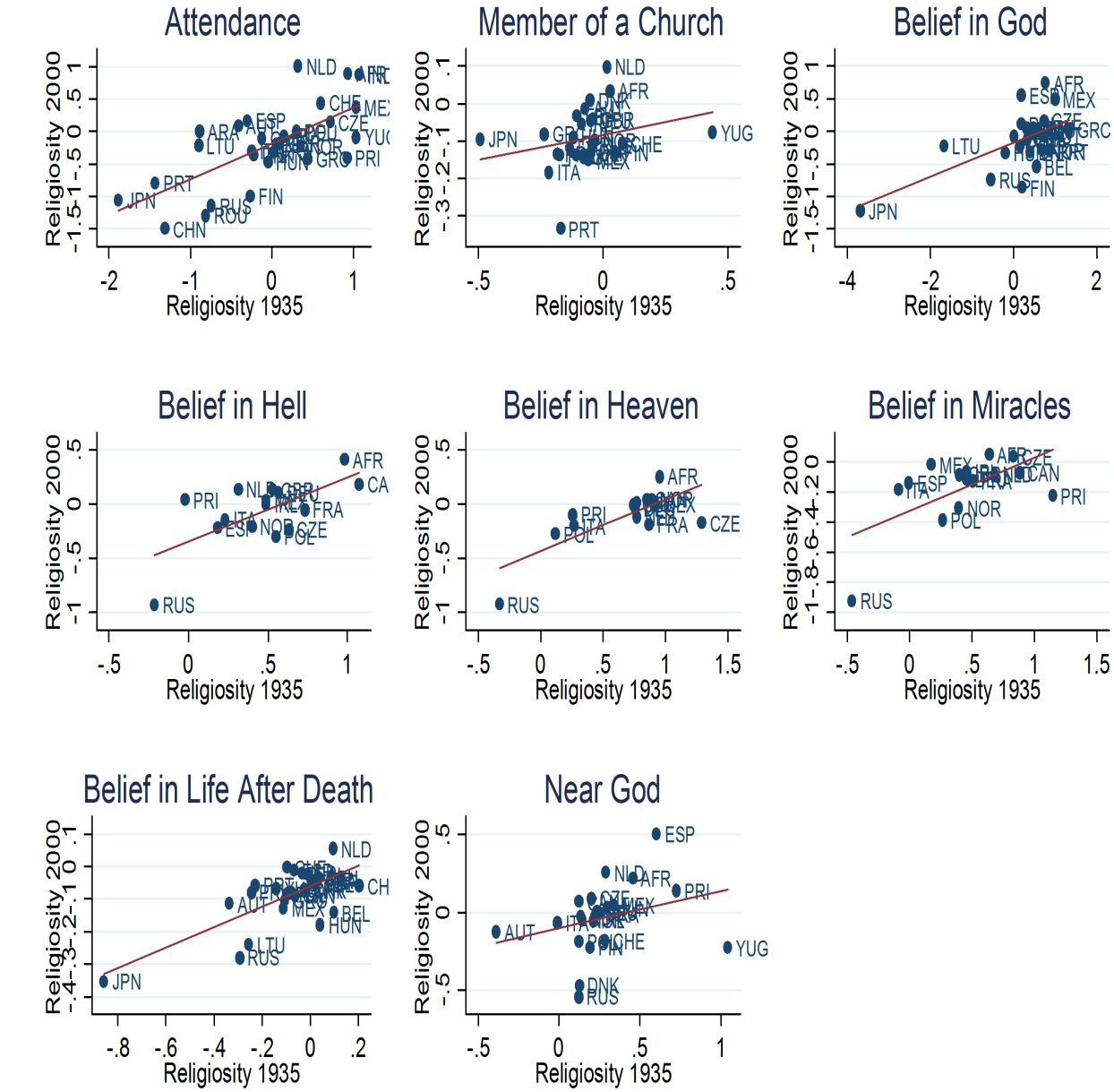

FIGURE 1: Correlation Between Inherited Religiosity in 1935 and 2000

Correlation Between the Inherited Measures of Religiosity and Current Measures of Religiosity The final stage of the analysis correlates all eight measures of religiosity with current proxies of religiosity derived from the WVS. The main underlying assumption of our analysis is that inherited religiosity should be positively and significantly correlated with the religiosity at the home country as estimated using the WVS.

To execute this stage we regress inherited religiosity, as estimated in the second stage, with the corresponding measure of current religiosity from the WVS and a number of individual characteristics such as age, age square, gender, income and employment status.

Tables 4 and 5 establish that seven out of the eight remaining measures correlate positively with a corresponding measure from the WVS. Table 4 presents the regression coefficients of each religiosity measure of the 1935 cohort on the corresponding measure from the WVS.[9] Table 5 presents the regression coefficients of each religiosity measure of the 2000 cohort on the corresponding WVS measure.

In particular, Column (1) of each table correlates attendance with a measure on attendance from the WVS. [10] Column (2) correlates religious activity with a WVS measure of belonging to a church or not.[11] Column (3) correlates belief in God with a WVS measure of belief in the existence of God.[12] Column (4) correlates belief in Hell with a WVS measure of belief in Hell.[13] Column (5) correlates belief in Heaven with a WVS measure of belief in Heaven.[14] Column (6) correlates belief in miracles with the same measure of belief in Heaven used in the previous question.[15] Column (7) correlates belief in postlife with the corresponding WVS measure.[16] Surprisingly this is the only measure that does not manifest persistence suggesting that attitudes towards belief in life after death have changed.[17] Since we cannot establish the presence of a heritable component of this particular belief we will drop it for the remainder of the analysis. In Column (8) we correlate the measure of intensity of beliefs with a measure of the WVS which indicates whether individuals agree with the

[9]We use the 1981-2008 integrated WVS-EVS data and all corresponding measure are the mean values of all waves.

[10]The question in the WVS is " I'm going to ask how often you do certain things. For each activity,would you say you do them every week or nearly every week; once or twice a month; only a few times a year; or not at all?". The measure takes values from 1 to 4 with 1 denoting "Not at all" and 4 denoting "Weekly". The variable has been restructured so as to facilitate interpretation of the results.

[11]The actual measure is the answer to the question "Now I am going to read out a list of voluntary organizations; for each one, could you tell me whether you are a member, an active member, an inactive member or not a member of that type of organization? Church or religious organization". The variable takes values from 0 to 2 with 0 denoting "Not a member" and 2 denoting "Active member".

[12]The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

[13]The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

[14]The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

[15]The WVS does not provide an equivalent measure for belief in miracles therefore we use belief in Heaven as a proxy. Similar results we obtain with other measures such as belief in Hell.

[16]The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

[17]This negative correlation persists even if we correlate the GSS measure with other WVS measures such as belief in Hell or Heaven, strongly suggested that attitudes towards this belief have changed over time.

statement that life is meaningful only because God exists.[18]

From tables 4 and 5 we derive two main conclusions: i) Seven out of our eight variables manifest an inherited component and will be thus used in the main body of the analysis, and ii) the coefficients of the remaining seven variables suggest that both cohorts' attitudes are correlated with the current measures of religiosity. Interestingly, as one would expect, the coefficients for the 1935 cohort are lower than the coefficients for the 2000 cohort suggesting that the persistence of religiosity, while present, dissipates over time.

3.2 Overall Religiosity Effects

This section empirically explores the effects of various aspects of religiosity on economic outcomes. The analysis exploits variations within countries to identify the effect of religiosity while controlling for country fixed effects and time fixed effect. The analysis therefore takes care most of the unobserved heterogeneity across countries by controlling for all time invariant characteristics associated with the country and time specific shocks.

The analysis follows the categorization of the variable into three main categories, religious participation, beliefs and intensity of religiosity.

3.2.1 Religious Participation

The first category, religious participation, comprises two variables.

The first one is denoted "Church Attendance". The question is "How often r attends religious services?" and the variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week".

Estimating the inherited religiosity measure for all countries for the years 1935 and 2000 allows us to exploit variations in the attendance rates across and within 25 countries.[19] The analysis in Table 6 exploits within country variation via controlling for time and country fixed effects. Column (1) establishes that higher attendance is associated with higher levels of income per capita while controlling only for time and country fixed effects. Column (2) controls for lagged values of income per capital in 1870 and 1930 correspondingly, constructed using the Bolt and van Zanden (2013) dataset. This control is critical for capturing a country's initial condition. The results suggest that whereas the coefficient reduces somewhat in magnitude, nevertheless the effect of attendance remains positive and significant.

[18]Since WVS does not have a direct measure of how close one feels to god we use this as a proxy. The actual statement is "Life is meaningful only because God exists" and the variable takes the value 0 if they disagree with the statement and the value 1 if the agree. The results are similar if we use instead other proxies from the WVS such as belief in God.

[19]The reason for the reduction in the number of countries included in the analysis is that the benchmark specification takes into account only countries with more than 20 observations available for each cohort.

TABLE 4: Correlation between Current Religiosity Measures (WVS) and 1935 Inherited Religiosity Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Religiosity 1935							
	Attend	Church Member	God	Hell	Heaven	Miracles	Postlife	Near God
Church Attend	0.797***							
	(0.008)							
Church Member		0.244***						
		(0.006)						
Belief in God			0.411***					
			(0.019)					
Belief in Hell				0.498***				
				(0.024)				
Belief in Heaven					0.161***	0.247***		
					(0.017)	(0.024)		
Belief in Postlife							-0.168***	
							(0.003)	
Near God								0.035***
								(0.012)
Age	0.001	0.001*	-0.001	0.007***	0.002	0.006**	0.001***	0.001
	(0.001)	(0.000)	(0.001)	(0.003)	(0.002)	(0.002)	(0.000)	(0.001)
Age Sq.	-0.000**	-0.000	-0.000	-0.000**	-0.000	-0.000*	-0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Men	0.002	0.005***	0.015*	0.007	0.004	-0.006	0.001	-0.002
	(0.005)	(0.002)	(0.009)	(0.015)	(0.010)	(0.014)	(0.001)	(0.005)
Income	-0.009***	-0.000	-0.003*	-0.001	0.001	-0.005	-0.001***	-0.000
	(0.001)	(0.000)	(0.002)	(0.003)	(0.002)	(0.003)	(0.000)	(0.001)
Employed	-0.003	-0.001	-0.003	0.005	0.000	0.018	0.003*	0.002
	(0.006)	(0.002)	(0.011)	(0.020)	(0.014)	(0.019)	(0.001)	(0.006)
R-sq.	19570	7614	3800	810	805	812	7356	786
Obs	0.331	0.200	0.127	0.363	0.105	0.132	0.382	0.023

Summary:The table reports the correlation coefficients of the individual responses of the 1935 cohort on each aspect of religiosity, with the corresponding current measures derived from the WVS. The analysis controls for individual characteristics such as age, age square, gender, income and employment status. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 5: Correlation between Current Religiosity Measures (WVS) and 2000 Inherited Religiosity Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Religiosity 2000							
	Attend	Church Member	God	Hell	Heaven	Miracles	Postlife	Near God
Church Attend	0.907***							
	(0.008)							
Church Member		0.170***						
		(0.004)						
Belief in God			1.087***					
			(0.019)					
Belief in Hell				0.473***				
				(0.026)				
Belief in Heaven					0.466***	0.296***		
					(0.020)	(0.019)		
Belief in Postlife							-0.030***	
							(0.003)	
Near God								0.573***
								(0.028)
Age	0.002***	0.000	0.004**	0.008***	0.005**	0.004*	0.000	0.001
	(0.001)	(0.000)	(0.001)	(0.003)	(0.002)	(0.002)	(0.000)	(0.002)
Age Sq.	-0.000***	-0.000	-0.000***	-0.000**	-0.000*	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Men	0.004	0.003***	0.010	0.025	0.023*	0.018	0.001	0.006
	(0.004)	(0.001)	(0.008)	(0.016)	(0.012)	(0.012)	(0.001)	(0.014)
Income	-0.009***	-0.000	-0.010***	-0.005	-0.003	-0.002	-0.001**	-0.006**
	(0.001)	(0.000)	(0.002)	(0.003)	(0.003)	(0.002)	(0.000)	(0.002)
Employed	0.006	-0.000	-0.017	-0.028	-0.011	-0.015	-0.001	-0.004
	(0.006)	(0.002)	(0.011)	(0.022)	(0.016)	(0.016)	(0.002)	(0.017)
R-sq.	20480	7957	4111	853	868	873	7909	857
Obs	0.420	0.171	0.464	0.305	0.414	0.230	0.014	0.352

Summary:The table reports the correlation coefficients of the individual responses of the 2000 cohort on each aspect of religiosity, with the corresponding current measures derived from the WVS. The analysis controls for individual characteristics such as age, age square, gender, income and employment status. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

Our results in the first two columns suggest that attendance is good for growth. However it is not clear how this effect operates. Following the discussion in the related literature we want to explore what are the channels through which religiosity affects growth. We will explore three main channels discussed in the literature. Column (3) explores the channel of education. As already discussed in the related literature section (Becker and Woessman, 2009; Botticini and Eckstein, 2005) it has been argued that one of the channels through which religiosity (particularly in the case of protestant or Jewish population) operates is via its effect on education. To explore this channel we introduce a control for individuals' education in the micro part of the analysis[20]. The coefficient reduces somewhat in magnitude yet it remains significant at the 5% level, therefore suggesting that education is not the main channel associated with attendance.

Column (4) explores the channel suggested by Putnam (2000); Glaeser and Sacerdote (2008) who argue that higher attendance could be associated with higher levels of social capital and thus with higher growth (Algan and Cahuc, 2010). Interestingly, once controlling for the level of trust of individuals, the positive effect of attendance on economic outcomes vanishes suggesting that one valid channel through which religiosity affect economic outcomes is via the creation of social ties triggered by religious participation.

Columns (5)-(7) explore the channel suggested by Barro and McCleary (2003) and Guiso et al. (2003). In particular, Guiso et al. (2003) suggest that religiosity is associated with several traits that are conducive to growth such as hard work, helping others and fairness. Barro and McCleary (2003) further elaborate on this issue by arguing that attendance is bad for growth once one is holding beliefs constant. The positive effect of religion on growth, according to their theory, operates via the effect of religiosity on traits conductive to growth such as honesty and hard work. Moreover they show that attendance is good only to the extent that it affects beliefs. For a given level of beliefs, more attendance is considered to be a non-productive allocation of time and therefore can adversely affect growth. Our findings are in line with the findings in the literature suggesting that individual traits are a crucial channel of religiosity on growth and once one controls for these channels the positive effect of church attendance dissipates.

Analytically, Column (5) controls for attitudes on hard work, Column (6) for attitudes towards helping others and Column (7) for attitudes towards fairness.[21] Once controlling for each of these traits the positive effect of church attendance on growth dissipates.

[20] As already explained in the empirical section, controlling for these factors in the micro part of the analysis allows us to sustain the same degrees of freedom given that our sample is already quite limited. The variable on individuals' education is an ordered variable taking values from 0 to 20, denoting the highest number of years in school.

[21] The questions of the GSS on hard work, honesty and fairness capture to what extend parents consider each of these qualities are important for children. The responses are ordered as follows: "Most important", "2nd important", "3rd important", "4th important" and "least important".

TABLE 6: The Effect of Church Attendance on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Church Attendance	**4,778****	**3,394****	**3,195****	**595.8**	**595.8**	**-841.0**	**816.3**
	(1,963)	**(1,616)**	**(1,545)**	**(1,147)**	**(1,147)**	**(2,048)**	**(2,329)**
Initial GDP		2.818**	2.838**	2.949**	2.949**	3.014**	2.964**
		(1.207)	(1.224)	(1.101)	(1.101)	(1.354)	(1.303)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.826	0.887	0.886	0.918	0.880	0.880	0.876
Countries	25	25	25	22	25	25	25
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that church attendance has a significant positive effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores for the channels of human capital, trust and individual traits conducive to growth and establishes that the positive effect of attendance operates via trust and traits.
Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

The second variable is membership in church, denoted by "Church Member". The question is "Membership in Church Groups" and the variable is binary with 1 denoting "Yes" and 2 denoting "No".

Estimating the inherited church membership measure for all countries for the years 1935 and 2000 allows us to exploit variations in religiosity across and within 21 countries. Column (1) controls for country and time fixed effects, whereas column (2) controls for the lagged value of income per capita. The results suggest that being a member of a church is positively associated with economic outcomes. Column (3) explores the channel of education. The coefficient increases both in magnitude and significance suggesting that the effect of being a church member on economic outcomes does not operate via education. On the contrary once controlling for this channel the results become even more significant. Column (4) explores the

TABLE 7: The Effect of Church Membership on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Church Member	**11,957**	**10,520***	**12,148****	**6,125**	**-7,148**	**-841.0**	**6,364**
	(7,244)	**(5,958)**	**(5,381)**	**(7,607)**	**(5,538)**	**(2,048)**	**(7,635)**
Initial GDP		1.820*	1.774**	1.794	2.247*	3.014**	1.775
		(0.881)	(0.840)	(1.045)	(1.166)	(1.354)	(1.049)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.890	0.911	0.914	0.904	0.928	0.880	0.905
Countries	20	20	20	20	20	20	20
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that church membership has a significant positive effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores for the channels of human capital, trust and individual traits conducive to growth and establishes that the positive effect of attendance operates via trust and traits. Notes: (i) Church Member" corresponds to the question "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

channel of trust and social capital. Similarly to the case of church attendance the coefficient reduces in magnitude and it becomes insignificant. Therefore trust is a critical mechanism associated with church attendance. Columns (5)-(7) control sequentially for the effect of traits such as hard work, helping others and fairness. In all three columns the inclusion of these traits takes away the significance of the effect of church membership.

Overall, the results of this section highlight that whereas church attendance and church participation have a significant effect on economic outcomes, yet this effect takes place via the channels of social capital and of the development of traits that are conducive to growth. On the contrary education does not affect the results.

3.2.2 Beliefs

This section explores whether inherited beliefs have an effect on income per capita. Four different types of beliefs are explored, i.e. belief in God, Hell, Heaven and Miracles.

Table 8 employs as a proxy for beliefs, belief in God, denoted by "God". The question is "r's confidence in the existence of God?" and the variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists". Column (1) controls for time and country of origin fixed effects whereas column (2) controls for the initial level of income per capita. The coefficient on the level of belief suggests that belief in God has no effect on economic outcomes.

Crucially, as has been documented in the previous section, education, trust and beliefs are mechanisms intrinsically associated with religiosity. Therefore we control for all these channels in order to net out their effect. Column (3) introduces the educational level of the respondent in the analysis. The results remain unaffected. Column (4) introduces a control for the level of trust of the individuals. Interestingly the coefficient on belief in God becomes significant at the 10% level, suggesting that once netting out the effect of belief in God on the development of traits conducive to growth, belief in God has an adverse effect on economic outcome potentially capturing either the allocation of time in non-productive activities as Barro and McCleary (2003) suggested. It could also reflect or factors such as intolerance, self-restrictions etc. Similar results are obtained once we control for individual traits in Columns (5)-(7). Controlling for attitudes towards hard work, helping others and fairness always renders the coefficient on belief in God negative and significant at the 10% and the 5%.

Table 9 employs as a proxy for beliefs, belief in hell, denoted by "Hell". The variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not". Column (1) controls for time and country of origin fixed effects whereas Column (2) controls for the initial level of income per capita. The coefficient on the level of belief suggests that belief in hell has not effect on economic outcomes. Column (3) introduces the role of education in the analysis, Column (4) controls for individual trust whereas Columns (5)-(7) controls for attitudes towards hard work, helping others and fairness respectively. The result remains insignificant throughout.

Table 10 employs as a proxy for beliefs, belief in heaven denoted by "Heaven". The variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not". Column (1) controls for time and country of origin fixed effects whereas column (2) controls for the initial level of income per capita. The coefficient on the level of belief suggests that belief in heaven has not effect on economic outcomes. Column (3)

TABLE 8: The Effect of Belief in God on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Belief in God	**-3,604**	**-3,777**	**-3,932**	**-3,328***	**-3,405***	**-3,370***	**-3,454****
	(2,887)	**(2,556)**	**(2,575)**	**(1,741)**	**(1,735)**	**(1,699)**	**(1,505)**
Initial GDP		2.003*	1.989*	1.815	1.545	1.539	1.685
		(1.086)	(1.083)	(1.173)	(1.147)	(1.150)	(1.104)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.892	0.916	0.918	0.921	0.921	0.921	0.924
Countries	21	21	21	21	21	21	21
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that belief in God has no effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores for the channels of human capital, trust and individual traits conducive to growth and establishes that once we control for the channels of trust and individual traits, stronger belief in God is associated with lower economic outcomes. Notes: (i) "God" corresponds to the question "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 9: The Effect of Belief in Hell on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Belief in Hell	2,493	4,562	3,509	2,204	2,671	2,582	2,288
	(7,336)	(4,987)	(4,831)	(3,714)	(3,627)	(3,626)	(3,746)
Initial GDP		3.804*	3.766*	3.738*	3.697*	3.710*	3.739*
		(1.859)	(1.859)	(1.780)	(1.749)	(1.746)	(1.784)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.906	0.939	0.937	0.937	0.939	0.939	0.938
Countries	12	12	12	12	12	12	12
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that belief in God has no effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores for the channels of human capital, trust and individual traits conducive to growth and establishes that once we control for the channels of trust and individual traits, stronger belief in God is associated with lower economic outcomes. Notes: (i) "Hell" corresponds to the question "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 10: The Effect of Belief in Heaven on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Belief in Heaven	-8,091	936.1	666.0	3,378	6,032	5,749	3,711
	(9,663)	(11,865)	(12,162)	(2,855)	(3,837)	(3,705)	(3,278)
Initial GDP		3.823	3.785	4.007*	4.452*	4.496*	4.090*
		(2.679)	(2.648)	(2.058)	(2.143)	(2.202)	(2.104)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.906	0.930	0.930	0.933	0.938	0.937	0.933
Countries	11	11	11	11	11	11	11
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that belief in Hell has no effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores for the channels of human capital, trust and individual traits conducive to growth and establishes that the effect of belief in heaven remains unchanged. Notes: (i) "Heaven" corresponds to the question "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

introduces the role of education in the analysis, Column (4) controls for individual trust whereas Columns (5)-(7) controls for attitudes towards hard work, helping other and fairness respectively. The result remains insignificant throughout.

Table 11 employs as a proxy for beliefs, belief in miracles denoted by "Miracles". The variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not". Column (1) controls for time and country of origin fixed effects whereas column (2) controls for the initial level of income per capita. The coefficient on the level of belief suggests that belief in miracles has not effect on economic outcomes. Column (3) introduces the role of education in the analysis, Column (4) controls for individual trust whereas Columns (5)-(7) controls for attitudes towards hard work, helping other and fairness respectively. The result remains insignificant throughout.

TABLE 11: The Effect of Belief in Miracles on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Belief in Miracles	-6,798	2,430	843.7	1,212	1,556	1,501	1,341
	(5,107)	(9,086)	(9,218)	(4,930)	(4,630)	(4,546)	(5,127)
Initial GDP		4.236	3.835	3.899*	3.998*	3.995*	3.942*
		(3.491)	(3.524)	(2.096)	(2.098)	(2.110)	(2.131)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.917	0.936	0.935	0.936	0.936	0.936	0.936
Countries	12	12	12	12	12	12	12
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that belief in Miracles has no effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores for the channels of human capital, trust and individual traits conducive to growth and establishes that the effect of belief in miracles remains unchanged. Notes: (i)"Miracles" corresponds to the question "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

Overall the analysis in this section suggests that most types of beliefs do not have any effect on economic outcomes with the exception of belief in God. We interpret though these results with more caution due to the small number of observations.

3.2.3 Intensity of Religiosity

This section explores the effect of intensity of religiosity on economic outcomes.

The variable employed is denoted by "Near God". The question is "How close does r feel to God" and the variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close".

Column (1) controls for country and time fixed effects, whereas column (2) controls for the lagged value of income per capita. The results suggest that stronger religiosity is positively associated with growth.

Column (3) introduces a control for the educational level of the individual, yet the results remain unaffected. Column (4) controls for individual trust and noticeably the coefficient increases in magnitude suggesting that in the case of intensity of religiosity, social capital does not matter. This could reflect the fact that contrary to attendance which involves social interaction, intensity of religiosity reflects an internal process. This conclusion is further reinforced by the results of Columns (5)-(7) which control for attitudes towards hard work, helping others and fairness respectively. In columns (5) and (6) the coefficient remains positive but becomes insignificant, whereas in Column (7) the coefficient is still significant yet it reduces in magnitude. Overall the results are indicative of the fact that intensity of religious beliefs is affecting the formation of traits that are conducive to growth and thus affects economic outcomes indirectly.

3.3 Specific Religions

This section explores the effect of certain religious aspects on growth when exploiting variations in religiosity of specific religious groups. In the absence of a large number of observations we will focus only on two religious groups, Protestants and Catholics. The group of Protestants comprises 16,045 individuals whereas the group of Catholics comprises 7,168 individuals from 32 countries for the sample of second, third and fourth generation migrants.

Table 13 explores all seven aspects of religiosity for the sample of Protestants. Columns (1)-(2) explore the effect of religious participation on economic outcomes. The analysis establishes the positive effect of both "Attendance" and "Church Membership", in line with our former findings. Columns (3)-(6) explore the effect of beliefs (god, hell, heaven, miracles) and establish the same results with our benchmark analysis, i.e. that beliefs do not have any effect on income, with the exception of belief in heaven. The coefficient on belief in heaven

TABLE 12: The Effect of Intensity of Faith on Income per Capita

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
Near God	8,530***	8,120***	8,213***	8,607***	3,832	4,972	7,123***
	(1,817)	(1,286)	(1,297)	(1,737)	(4,622)	(4,674)	(1,389)
Initial GDP		1.805*	1.773*	1.962**	1.609	1.691	1.871*
		(0.964)	(0.947)	(0.823)	(1.158)	(1.158)	(0.966)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.903	0.923	0.924	0.925	0.915	0.916	0.923
Countries	18	18	18	18	18	18	18
Micro controls							
Education	No	No	**Yes**	No	No	No	No
Trust	No	No	No	**Yes**	No	No	No
Hard Work	No	No	No	No	**Yes**	No	No
Help Others	No	No	No	No	No	**Yes**	No
Fair	No	No	No	No	No	No	**Yes**

Summary: The table establishes that intensity of belief in God has a positive effect on economic outcomes. The analysis uses a panel for the period 1935-2000 and controls for income per‘ capita in 1870 and 1930 correspondingly, for time and country fixed effects. Moreover the analysis explores the channels of human capital, trust and individual traits conducive to growth and establishes that the effect of intensity of religiosity on growth operates via the development of individual traits conducive to growth such as hard work and helping others. Notes: (i) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (ii) the analysis on the channels is undertaken in the micro part of the empirical section, i.e. we control for education, trust and individual traits in the construction of the inherited religiosity measure; (iii) robust standard error estimates are reported in parentheses; (iv) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

TABLE 13: The Effect of Religiosity on Income per Capita-Protestants

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
	Attend	Church Member	God	Hell	Heaven	Miracles	Near God
Religiosity	1,333*	9,255***	-2,514	1,214	8,974**	3,607	4,847
	(696.4)	(2,382)	(4,019)	(1,917)	(3,894)	(3,182)	(4,311)
GDPini	3.022**	1.401	1.686	3.939*	2.566	4.510**	1.896*
	(1.261)	(0.881)	(1.119)	(2.160)	(1.662)	(2.008)	(0.935)
Time FE	Yes	Yes	Yes	Yes		Yes	Yes
Country FE	Yes	Yes	Yes	Yes		Yes	Yes
R-sq.	0.886	0.926	0.920	0.937	0.950	0.940	0.908
Countries	25	20	21	12	11	12	18

Summary:The table explores the effect of all seven aspects of religiosity on economic outcomes for the sample of Protestants. The analysis controls for country and time fixed effects. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

is positive and significant implying that stronger beliefs are associated with better economic outcomes. Column (8) explores the effect of intensity of religiosity. Interestingly, for the sample of Protestants intensity of religiosity does not have a significant effect (at conventional levels) on economic outcomes.

Table 14 explores all seven aspects of religiosity for the sample of Catholics. Columns (1)-(2) explore the effect of attendance on economic outcomes. The analysis does not establish any significant effect of attendance on economic outcomes. Columns (3)-(6) explore the effect of beliefs (god, hell, heaven, post-life) and suggest similar results to our benchmark analysis, i.e. that beliefs do not have any on income per capita. The only exception is belief in heaven where the coefficient is significant at the 10% level and negative. Column (7) explores the effect of intensity of religiosity on economic outcomes and finds no significant effect at conventional levels.

TABLE 14: The Effect of Religiosity on Income per Capita-Catholics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
	Attend	Church Member	God	Hell	Heaven	Miracles	Near God
Religiosity	1,169	385.0	-2,314	-2,314	-7,810*	-1,292	3,094
	(1,361)	(4,358)	(2,118)	(2,118)	(3,577)	(2,510)	(2,525)
GDPini	2.960***	1.974*	2.237**	2.237**	2.861	2.986	1.622
	(0.916)	(1.074)	(1.006)	(1.006)	(1.745)	(2.048)	(1.351)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq.	0.892	0.901	0.910	0.910	0.943	0.928	0.917
Countries	25	20	20	20	11	12	18

Summary:The table explores the effect of all seven aspects of religiosity on economic outcomes for the sample of Catholics. The analysis controls for country and time fixed effects. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

4 Robustness

The robustness section establishes the robustness of the main results to a number of alternative specifications and assumptions. All the tables adopt the baseline assumptions, i.e. they control for time and country fixed effects as well as for the initial value of income per capita. The analysis covers all seven variables classified under the thee broad categories, i.e. attendance, beliefs and religious intensity.

TABLE 15: The Effect of Religiosity on Income per Capita-Higher Threshold

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
	Attend	Church Member	God	Hell	Heaven	Miracles	Near God
Religiosity	3,394**	11,278*	-3,894	4,333	911.9	1,855	8,579***
	(1,616)	(5,575)	(2,801)	(5,106)	(11,800)	(11,361)	(1,530)
GDPini	2.818**	1.945*	2.008*	3.838*	3.821	4.133	1.926*
	(1.207)	(0.957)	(1.103)	(2.022)	(2.701)	(3.746)	(0.973)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq.	0.887	0.909	0.911	0.934	0.930	0.930	0.925
Countries	25	19	20	10	10	10	17

Summary:The table establishes the robustness of the results to the use of a higher threshold in the construction of the inherited religiosity measures. In this table we set the threshold in min. 30 responses per country of origin. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

4.1 Using Alternative Thresholds

We first use establish the robustness of the results to the use of different thresholds in the number of observations. Restricting the analysis to countries with a larger number of individual observations, we further ensure that the estimated religiosity will be more representative of the religiosity of the group, not driven by some outliers and extreme religious attitudes. Reassuringly, as Table 15 suggests, increasing the threshold of individual observation from 20 to 30 leaves our results rather unaffected despite the reduction in the sample.

4.2 Longer Generations and Longer Gap

One major contribution of the approach developed by Algan and Cahuc (2010) is that it effectively addresses omitted variable bias by including country fixed effects in the estimation. Moreover, the use of a 25 year lag between income and the inherited trust component is further addressing endogeneity issues. However, whereas their approach takes care of all time invariant variables associated with the country, unobservable time varying components could still be correlated with changes in both the level of inherited trust and income per capita at the country of origin.

To further mitigate such concerns we make two additional assumptions. First we assume that each generation lasts for 35 years and second we adopt a 45 years gap between the periods of interest (i.e. $T_1 = 1935$ and $T_2 = 2000$) and the date of the estimated inherited religiosity measure (i.e. $T_1 - 45 = 1890$ and $T_2 - 35 = 1955$). By increasing both the duration of the generation and the distance between the estimated measures and the outcomes we aspire to further mitigate the potential effect of unobservables. To construct the new sample, for the cohort of migrants that we'll use to estimate the 1935 inherited religiosity (henceforth 1935 cohort) we use the following rules: i) Second generation migrants born before 1900 ($X_2 < 1890$), ii) Third generation migrants born before 1935 ($X_3 < 1925$), and iv) Fourth generation migrants born before 1970 ($X_4 < 1960$).

Reassuringly, the results in Table 16 are confirming our findings in the baseline analysis, i.e. attendance has a positive effect on economic outcomes, beliefs in most case do not have a significant effect and religious intensity and membership in a church are conducive to growth. Moreover whenever introducing the mediating channels our findings are in line with the findings in the baseline analysis (results not reported).

4.3 Different Period (1950-2000) and Additional Controls

In an attempt to capture time invariant characteristics as well as to show that the results are robust to a different choice of period we will explore the effect of religiosity on economic outcomes for the period 1950-2000. Whereas this approach will reduce the time frame, it will also allow us to introduce more time variant controls in the analysis. The controls that we are introducing are initial level of income per capita, a Herfindahl index of religions, average years of schooling and an indicator for the quality of institutions.[22]. The analysis focuses on the variables for which we had the larger number of observations and a significant effect, i.e. attendance, church membership and intensity of religiosity.

[22]The Herfindahl index of religions comes from (Barro and McCleary, 2003) average schooling level is derived from the Barro-Lee dataset (Barro and Lee, 2001) and the polity measure is derived from the Polity IV dataset.

TABLE 16: The Effect of Religiosity on Income per Capita-Longer Gap and Longer Generation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	GDP per Capita						
	Attend	Church Member	God	Hell	Heaven	Miracles	Near God
Religiosity	4,350***	14,134**	-907.4	1,168	-2,274	289.5	6,952***
	(1,215)	(5,814)	(2,565)	(6,756)	(10,680)	(7,931)	(1,705)
GDPini	2.993***	1.674**	2.011*	3.771	3.236	3.702	1.815*
	(1.047)	(0.791)	(1.138)	(2.138)	(3.201)	(3.484)	(0.966)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq.	0.904	0.918	0.907	0.935	0.931	0.935	0.917
Countries	25	20	21	12	11	12	18

Summary:The table establishes the robustness of the results to the use of a 45 year gap and a 35 year generation gap thus further mitigating concerns about unobservables. The analysis controls for the baseline controls, i.e. initial income per capita, country of origin and year fixed effects. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists"; (iv) "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (v) "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vi) "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not"; (vii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (viii) robust standard error estimates are reported in parentheses; (ix) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

Analytically, Table 17 explores the effect of attendance (Columns (1)-(3)), of church membership (Columns (4)-(6)) and of intensity of religiosity (Columns (7)-(9)) on economic outcomes. Columns (1), (4) and (7) introduce in the analysis a Herfindahl index of religions which has a highly significant and negative coefficient suggesting that higher competition of religions is bad for economic outcomes. Columns (2), (5) and (8) introduce a control for the average years of schooling, whereas Columns (3), (6) and (9) introduce a control on the quality of institutions, which is positively correlated with income per capita. The coefficient on attendance reduces in magnitude however the significance remains at the 5% level after including all relevant controls. The coefficient on church membership reduces both in magnitude and significance. We find no significance at the conventional levels however the significance is slightly lower than the 10% level and even increases once we introduce additional controls. The coefficient on intensity of religiosity reduces in magnitude yet it retains its statistical significance at the 5% level. Controlling for the channels explored in the baseline analysis yields similar results (results not reported).

TABLE 17: The Effect of Religiosity on Income per Capita-1950-2000 Period

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	GDP per Capita								
	Attend			Member of a Church			Near God		
Religiosity	**1,672***	**1,741***	**2,141****	**7,986**	**7,971**	**8,198**	**4,478****	**4,252****	**4,683****
	(820.0)	**(877.5)**	**(782.0)**	**(5,815)**	**(5,648)**	**(5,300)**	**(1,716)**	**(1,991)**	**(2,143)**
GDPini	2.311***	2.624***	2.846***	1.356***	1.615**	1.892***	1.618***	1.715*	1.945***
	(0.616)	(0.841)	(0.792)	(0.422)	(0.762)	(0.326)	(0.482)	(0.828)	(0.328)
Herfindahl Index	-50,828***	-48,734***	-46,269***	-56,911***	-53,915***	-55,003***	-53,759***	-52,655***	-52,972***
	(11,266)	(12,351)	(11,088)	(10,217)	(11,239)	(8,728)	(10,708)	(11,897)	(8,811)
Education		616.2	980.5		484.6	309.2		207.3	43.59
		(854.9)	(731.9)		(961.4)	(511.4)		(1,040)	(530.6)
Polity			1,108*			2,061***			2,116***
			(629.4)			(379.9)			(318.0)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-sq.	0.942	0.944	0.954	0.965	0.966	0.981	0.966	0.966	0.983
Countries	26	26	26	20	20	20	18	18	18

Summary:The table establishes the robustness of the results to the use of a higher threshold in the construction of the inherited religiosity measures. In this table we set the threshold in min. 30 responses per country of origin. Notes: (i) "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week"; (ii) Church Member" corresponds to the question "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No"; (iii) "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close"; (iv) the WVS measures are constructed as the mean value of each measure for the period 1981-2008; (v) robust standard error estimates are reported in parentheses; (vi) *** denotes statistical significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level, all for two-sided hypothesis tests.

4.4 Robustness of the Estimation

4.4.1 Outliers

Figure 1 illustrates the correlations between the 1935 and 2000 inherited religiosity measures. To make sure that the positive correlation is not driven by outliers we remove the most obvious outliers, i.e. Russia and Japan. Removing these three countries weakens the correlations slightly however the results are still strongly supporting the hypothesis that there is inertial in cultural beliefs between the 1935 and 2000 cohorts, as illustrated in Figure 2.

The macroeconomic part of the analysis exploits within variation and thus replicating the results removing the outliers would not only further reduce the sample but would also provide no additional information.

4.4.2 Double Clustering

To further ensure the validity of the estimation the standard errors are clustered at both the ethnic origin dimension and the year of the response of the individuals. The significance of the coefficients remains unaffected.[23]

[23]Results not presented in the main text.

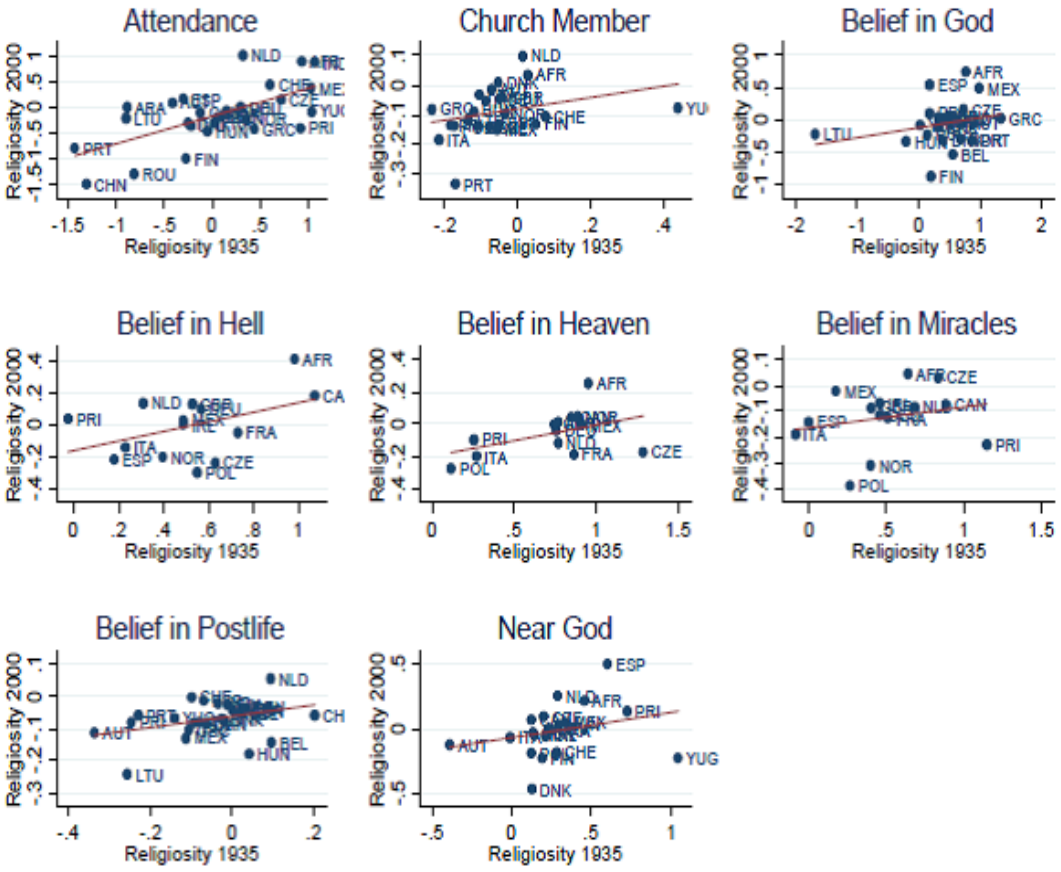

FIGURE 2: Correlation Between Inherited Religiosity in 1935 and 2000

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Appendices

A Summary Statistics

TABLE A.1: Countries of Origin of the 2nd, 3rd and 4th Generation Migrants-1935 Cohort

1935 Cohort			
Family Origin	Frequency	Family Origin	Frequency
Africa	2,011	Japan	6
Arab Countries	5	Lithuania	17
Austria	36	Mexico	103
Belgium	24	Netherlands	288
Canada	207	Norway	283
China	2	Philippines	-
Czech Rep.	104	Poland	173
Denmark	124	Portugal	15
Finland	47	Puerto Rico	20
France	387	Romania	5
Germany	3,319	Russia	56
Greece	12	Spain	96
Hungary	25	Sweden	245
India	14	Switzerland	84
Ireland	2,473	UK	3,948
Italy	243	Yugoslavia	16
Total		14,388	

Summary: The table shows the country of origin for the 1935 cohort of migrants as well as the number of migrants coming from each country.

TABLE A.2: Countries of Origin of the 2nd, 3rd and 4th Generation Migrants-2000 Cohort

2000 Cohort			
Family Origin	Frequency	Family Origin	Frequency
Africa	1,183	Japan	56
Arab Countries	26	Lithuania	74
Austria	115	Mexico	669
Belgium	34	Netherlands	214
Canada	307	Norway	309
China	46	Philippines	35
Czech Rep.	292	Poland	709
Denmark	109	Portugal	70
Finland	97	Puerto Rico	199
France	264	Romania	30
Germany	2,363	Russia	354
Greece	100	Spain	139
Hungary	129	Sweden	312
India	22	Switzerland	56
Ireland	1,643	UK	1,568
Italy	1,521	Yugoslavia	105
Total		13,150	

Summary: The table shows the country of origin for the 2000 cohort of migrants as well as the number of migrants coming from each country.

B Cultural Transmission of Religious Attitudes

TABLE B.1: Transmission of Religious Attitudes-Country of Origin Fixed Effects for the 1935 Cohort

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				1935 Cohort			
	Attend	Church Member	God	Hell	Heaven	Miracles	Near God
age	0.0276**	0.00979***	0.0152	0.0446***	0.0341**	0.0180	0.00991*
age2	-1.86e-05	-5.29e-05***	-8.22e-05	-0.000409***	-0.000278**	-0.000160*	-2.30e-05
men	-0.829***	-0.126***	-0.422***	-0.217**	-0.268***	-0.257***	-0.325***
income	0.102***	0.0181***	-0.0168	-0.00541	-0.0173**	-0.0117	-0.00775
emp	0.00322	-0.0120	0.0441	-0.0629	-0.0103	-0.0631	-0.0457
unemp	-0.599***	-0.0658**	-0.121	-0.196	-0.00649	-0.116	-0.277***
Africa	0.936***	0.0289***	0.766***	0.983***	0.955***	0.638***	0.456***
Arab Countries	-0.886***						
Austria	-0.414***	-0.0703***	0.702***				-0.385***
Belgium	0.0577		0.557***				
Canada	-0.118***	-0.108***	0.416***	1.072***	0.852***	0.883***	0.124***
China	-1.314***						
Czech. Rep	0.720***	-0.0761***	0.732***	0.630***	1.290***	0.836***	0.201***
Denmark	-0.221***	-0.0509***	0.401***				0.126***
Finland	-0.266***	0.0509***	0.205***				0.192***
France	0.0210*	-0.105***	0.330***	0.731***	0.867***	0.509***	0.255***
Germany	0.304***	-0.0487***	0.483***	0.567***	0.760***	0.457***	0.236***
Greece	0.441***	-0.234***	1.334***				
Hungary	-0.0474*	-0.120***	-0.193***				0.299***
India	1.070***						
Ireland	0.148***	-0.0861***	0.406***	0.490***	0.771***	0.457***	0.211***
Italy	-0.245***	-0.215***	0.491***	0.232***	0.271***	-0.0890***	-0.00984
Japan	-1.884***	-0.490***	-3.669***				
Lithuania	-0.900***	-0.133***	-1.670***				
Mexico	1.033***	-0.0562***	0.993***	0.489***	0.912***	0.173***	0.337***
Netherlands	0.324***	0.0162***	0.582***	0.311***	0.771***	0.682***	0.290***
Norway	0.356***	-0.0339***	0.691***	0.399***	0.888***	0.398***	0.146***
Poland	0.301***	-0.173***	0.149***	0.549***	0.120***	0.266***	0.122***
Portugal	-1.433***	-0.170***	0.871***				
Puerto Rico	0.923***	-0.183***	0.183***	-0.0227	0.257***	1.148***	0.726***
Romania	-0.811***						
Russia	-0.744***	-0.0446***	-0.544***	-0.212***	-0.327***	-0.460***	0.121***
Spain	-0.300***	-0.0493***	0.184***	0.181***		-0.00182	0.602***
Switzerland	0.607***	0.0776***	0.329***				0.285***
UK	0.0981***	-0.0406***	0.321***	0.528***	0.747***	0.403***	0.138***
Yugoslavia	1.041***	0.440***	0.0272				1.043***
Observations	12,888	5,987	3,686	850	862	848	3,382
R-squared	0.058	0.057	0.055	0.056	0.078	0.064	0.097

Summary:The table establishes the significance of the coefficient of the country of origin fixed effects for the 1935 cohort, suggesting that culture matters in the transmission of religious attitudes.

TABLE B.2: Transmission of Religious Attitudes-Country of Origin Fixed Effects for the 2000 Cohort

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				2000 Cohort			
	Attend	Church Member	God	Hell	Heaven	Miracles	Near God
age	0.0364***	0.00912***	0.0329***	0.0183	0.0113	0.0242**	0.00658
age2	-0.000144	-6.08e-05*	-0.000259***	-0.000263*	-0.000140	-0.000228*	2.52e-05
men	-0.582***	-0.0880***	-0.428***	-0.161	-0.271***	-0.351***	-0.252***
income	0.0820***	0.0154***	0.0114	0.0328*	0.0137	0.0386**	-0.00521
emp	-0.156**	-0.00421	-0.0752	-0.0480	-0.0923	-0.109	-0.00459
unemp	-0.628***	-0.0821**	-0.0398	0.195	0.174	0.329	0.0559
Africa	0.893***	0.0346***	0.744***	0.409***	0.256***	0.0454	0.217***
Arab Countries	0.00300						
Austria	0.0877**	-0.0144	-0.0656***				-0.127***
Belgium	-0.190***		-0.542***				
Canada	-0.104***	-0.140***	-0.00281	0.183***	0.0429**	-0.0743***	0.0673***
China	-1.495***						
Czech. Rep	0.139***	-0.143***	0.161***	-0.236***	-0.173***	0.0311	0.0901***
Denmark	-0.358***	0.00835	-0.315***				-0.473***
Finland	-0.991***	-0.133***	-0.866***				-0.229***
France	-0.315***	-0.0332***	-0.120***	-0.0499**	-0.190***	-0.127***	-0.0113
Germany	-0.0128	-0.0460***	0.0510***	0.103***	-0.0402***	-0.115***	0.00272
Greece	-0.420***	-0.0819***	0.0252**				
Hungary	-0.473***	-0.0891***	-0.331***				0.0285
India	0.865***						
Ireland	-0.0662***	-0.0541***	3.60e-05	0.000672	0.0129	-0.0692**	-0.0539***
Italy	-0.296***	-0.185***	-0.0214***	-0.142***	-0.201***	-0.187***	-0.0689***
Japan	-1.057***	-0.0955***	-1.221***				
Lithuania	-0.213***	-0.121***	-0.222***				
Mexico	0.371***	-0.153***	0.494***	0.0290	-0.00424	-0.0219	0.0448***
Netherlands	1.005***	0.0985***	0.0238**	0.137***	-0.118***	-0.0845***	0.255***
Norway	-0.226***	-0.0995***	-0.296***	-0.205***	0.0451***	-0.309***	-0.0508***
Philippines	0.348***						
Poland	0.00164	-0.140***	-0.227***	-0.298***	-0.277***	-0.388***	-0.191***
Portugal	-0.797***	-0.337***	-0.310***				
Puerto Rico	-0.405***	-0.135***	0.109***	0.0391	-0.0949**	-0.229***	0.137***
Romania	-1.286***						
Russia	-1.142***	-0.110***	-0.744***	-0.928***	-0.922***	-0.921***	-0.544***
Spain	0.166***	-0.133***	0.551***	-0.218***		-0.142***	0.505***
Switzerland	0.440***	-0.107***	-0.116***				-0.185***
UK	-0.173***	-0.0425***	0.0445***	0.134***	-0.00194	-0.0856***	-0.0304**
Yugoslavia	-0.0848**	-0.0770***	-0.0790***				-0.232***
Observations	11,948	3,588	4,912	1,012	1,004	1,015	2,078
R-squared	0.066	0.049	0.083	0.072	0.073	0.079	0.076

Summary: The table establishes the significance of the coefficient of the country of origin fixed effects for the 2000 cohort, suggesting that culture matters in the transmission of religious attitudes.

C Variable Definitions and Sources

C.1 Micro Analysis Variables

GSS Dataset.

Church Attendance. "Church Attendance" corresponds to the question "How often r attends religious services?". The variable takes values from 0 to 8, with 0 denoting "Never" and 8 denoting "More than once per week".
Member of a Church. "Church Member" corresponds to the question is "Membership in Church Groups". The variable is binary with 1 denoting "Yes" and 2 denoting "No".

Belief in God. "God" corresponds to the question is "r's confidence in the existence of God?". The variable takes values from 0 to 5, with 0 denoting "Don't believe" and 5 denoting "Know god exists".

Belief in Hell. "Hell" corresponds to the question is "r's belief in hell" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not".

Belief in Heaven. "Heaven" corresponds to the question is "r's belief in heaven" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not".

Belief in Postlife. "Postlife" corresponds to the question is "r's belief in postlife" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not".

Belief in Miracles. "Miracles" corresponds to the question is "r's belief in miracles" and the variable takes values from 0 to 3, with 0 denoting " Yes definitely" and 3 denoting "No, definitely not".

Intensity of Religiosity. "Near God" corresponds to the question "How close does r feel to God". The variable takes values from 0 to 4 with 0 denoting "Does not believe" and 4 denoting "extremely close".

Age. The variable indicates the age of individuals and takes values between 18-89. Age squared is the squared value of Age.

Men. The variable takes the value 1 if the gender of the individual is male.

Employed. The variable takes the value 1 if the individual is employed.

Income. The variables captures the income of individuals. It has 12 categories (1000$, 1000$-2999$, 3000$-3999$, 4000$-4999$, 5000$-5999$, 6000$-6999$, 7000$-7999$, 8000$-9999$, 10000$-14999$, 15000$-19999$, 20000$-24999$, 25000$ or more).

Education. The variable on individuals' education is an ordered variable taking values from 0 to 20, denoting the highest number of years in school.

Trust. "Trust" is constructed using data from the relevant GSS question, on how much people can be trusted. The variable is binary and take the value of 0 if the response is "Cannot trust" or "Depends" and the value of 1 if the response is "People can be trusted".

Hard Work. This variable captures the extend to which parents consider hard work as an important quality to teach to a child. The responses are ordered as follows: "Most important", "2nd important", "3rd important", "4th important" and "least important".

Help Others. This variable captures the extend to which parents consider helping others as an important quality to teach to a child. The responses are ordered as follows: "Most important", "2nd important", "3rd important", "4th important" and "least important".

Fairness. This variable captures the extend to which parents consider fairness as an important quality to teach to a child. The responses are ordered as follows: "Most important", "2nd important", "3rd important", "4th important" and "least important".

Ethnic Origin. The variable captures the ethnic origin of the family of individuals. They can declare up to three countries of origin ordering them according to which they relate to more. In the analysis we choose their first response. The respondents come from 23 countries or continents (Austria, Belgium, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Ireland, Italy, Japan, Lithuania, Mexico, the Netherlands, Norway, Philippines, Poland, Portugal, Puerto Rico, Russia, Spain, Sweden, Switzerland, Great Britain and Yugoslavia. Moreover Africa is part of the sample (denoting all migrants of African origin) and Arabic countries.).

WVS

Church Attendance. The question in the WVS is " I'm going to ask how often you do certain things. For each activity,would you say you do them every week or nearly every week; once or twice a month; only a few times a year; or not at all?". The measure takes values from 1 to 4 with 1 denoting "Not at all" and 4 denoting "Weekly". The variable has been restructured so as to facilitate interpretation of the results.

Member of a Church. The actual measure is the answer to the question "Now I am going to read out a list of voluntary organizations; for each one, could you tell me whether you are a member, an active member, an inactive member or not a member of that type of organization? Church or religious organization". The variable takes values from 0 to 2 with 0 denoting "Not a member" and 2 denoting "Active member".

Belief in God. The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

Belief in Hell. The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

Belief in Heaven. The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

Belief in Postlife. The WVS measure is binary with 0 denoting "No" and 1 denoting "Yes".

Intensity of Religiosity. Since WVS does not have a direct measure of how close one feels to god we use this as a proxy. The actual statement is "Life is meaningful only because God exists" and the variable takes the value 0 if they disagree with the statement and the value 1 if the agree. The results are similar if we use instead other proxies from the WVS such as belief in God.

C.2 Macro Analysis Variables

Income per Capita. Our income per capita measure is constructed using the updated 2013 Maddison dataset (Bolt and van Zanden, 2013). For the years 1935-2000 we use the average of 5 years (i.e. 1930-1935 for $T_1 = 1935$ and 1995-2000 for $T_2 = 2000$). Similarly for the 1950-2000 period.

Initial Income per Capita. To construct the initial income per capita we use the updated 2013 Maddison dataset (Bolt and van Zanden, 2013). For the years 1935-2000 we take the 1870 income per capita for $T_1 = 1935$ and 1930 for $T_2 = 2000$). For the 1950-2000 period, we take respectively 1900 and 1950.

Herfindhal Index of Religions. The Herfindahl index of religion shares comes from the Barro dataset on religious adherence (Barro and McCleary, 2003) and is estimated using 10 religion groups and non-religion (including atheists).

Educational Attainement. The data on educational attainment comes from the Barro-Lee (Barro and Lee, 2001) dataset and indicates the average years of schooling attained aggregated at the country level.

Polity IV. The quality of institutions measures, denoted by "Polity" comes from the Polity IV data set. We employ the measure "constraints on the chief executive". The variable takes values from 1-7 with higher values denoting better quality of institutions.