

## Why did religiosity decrease in the Western World during the twentieth century?

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### Abstract

This article analyzes the decline in religiosity in the Western World during the twentieth century by using long-run data on church attendance. It tests the secularization hypothesis, which argues that economic growth decreases religiosity, and the religion-market model, which considers that governmental interventions in religious affairs have an impact on religiosity. The results provide scant evidence for the secularization hypothesis. They however support the religion-market model by showing that the growth of the welfare state significantly diminished religiosity. Such findings therefore suggest that many individuals were historically observant because churches offered welfare services which were not provided by the State.

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## 1. Introduction

Contemporary debates over religiosity almost always focus on church attendance, even when the trends (or the data) scarcely exist.<sup>1</sup> In the United States, for example, church attendance rates display remarkable long-run stability, stretching back from the present through the earliest Gallup polls. Yet scholars continue sifting through these data, teasing out age, period, and cohort effects, and arguing over their meaning (Chaves 1989; Hout and Greeley 1987; Hout and Greeley 1990; Miller and Nakamura 1996; Sasaki and Suzuki 1987). Indeed, some scholars such as Hadaway et al. (1993) have gone so far as to hypothesize a form of *invisible* secularization in which America's "actual attendance rate has declined since World War II, despite the fact that the survey rate remained basically stable."<sup>2</sup> If controversy surrounds the relatively long and reliable record of attendance in America, how can we trust claims about secularization or the persistence of religiosity in Canada or Western Europe, where attendance data are sparse?

There are actually two major theories of religiosity: the religion-market model and the secularization hypothesis. The religion-market model, developed by Iannaccone (1991), Iannaccone and Stark (1994), Iannaccone et al. (1997) and Gill (1999) among others, argues that religious participation is mainly "supply-driven". They view

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<sup>1</sup> Throughout this article, the term "church attendance" is used in place of the awkward, but more accurate, phrase "religious service attendance."

<sup>2</sup> As Hadaway and Marler (1998) emphasize, it was this hypothesis (that "Americans were reporting the same level of attendance to pollsters while their actual church participation was dropping") which led them to study "actual" versus "reported" rates of attendance. Likewise, it is this notion of a "growing gap" (whereby "consistent responses to the polls [have] masked declines in actual church attendance") which remains the most important and controversial feature of their work. For comments on Hadaway et al (1993), see Caplow (1998), Hout and Greeley (1998), Presser and Stinson (1998) and Woodberry (1996, 1998).

governmental interventions as major determinants of religiosity. As such, the existence of a state religion is expected to increase church participation (Barro and McCleary, 2005). A case in point is the policy of French King Louis XIV (1638-1715) who compelled the inhabitants of Paris to attend mass on Sundays lest they go to jail (Bluche, 1990). Conversely, the development of the welfare state is thought to decrease church attendance by crowding out the churches' charitable activities (Gruber and Hungerman, 2007; Hungerman, 2005, 2009) and reducing their ability to insure their members against adverse income shocks (see Dehejia et al., 2007).<sup>3</sup> Indeed, Gill and Lundsgaarde (2004) find there is a negative relationship between public spending and church attendance in cross-sectional data for a sample of countries in 1995.

However, following Weber (1905), proponents of the secularization hypothesis such as Chaves (1994) and Bruce (2001) consider that religious participation is “demand-driven”. They argue that economic development, which includes industrialization, increases in literacy and wealth, and a decrease in fertility rates, entails a decline in religiosity. This secularization process supposedly leads individuals to define themselves as less religious and decreases the influence of religion on social and political institutions. As a matter of fact, McCleary and Barro (2006a) find in a study of religiosity in 68 countries in the 1980s and 1990s that economic development has an overall negative effect on religiosity. Urbanization also makes individuals less observant but education and the presence of children are positively correlated with religiosity. Still, studies by

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<sup>3</sup> Dehejia et al. (2007) find that U.S. religious organizations reduce the effects of adverse income shocks on consumption by roughly 40% when using data between 1986 and 2000. If anything, this result suggests that churches could offset more than 40% of income shocks before the welfare state crowded out their charity endeavors.

Finke and Stark (1992), Iannaccone and Stark (1994), and Stark (1999) among others, argue that there is no empirical evidence to support secularization theories.

This article provides a test of the secularization hypothesis, which argues that economic growth decreases church participation, and of the religion-market model, which considers that state interventions in religious affairs, such as the development of the welfare state, reduces church attendance. For this purpose, it focuses on the changes in religiosity in the Western World during the twentieth century and relies on a large, international database on religious activity spanning many decades based on polls conducted by the International Social Survey Program (ISSP). As discussed by Iannaccone (2008), this dataset allows us to reconstruct long-run church attendance trends in the United States, Canada and most of Western Europe, thanks to a novel set of retrospective questions concerning the religious participation of the respondents and of their parents when the respondent was growing up. Because the childhood of older respondents occurred farther back in time, the ISSP functions as an intertemporal survey of religious involvement. Its 200,000 retrospective observations stretch from 1925 until 1990 – a longer and more detailed series of observations than we have ever had for any nation.

The ISSP data unequivocally show that church attendance decreased in the West during the twentieth century. The drop is particularly noticeable in some countries, like Great Britain, but less so in others like Ireland, which remains observant, or Norway, which already had a low level of religiosity in the 1920s. Nonetheless, the data show that the decline in church attendance was particularly pronounced after the 1960s, when most

Western countries experienced high growth rates and the development of the welfare state.

Our regression results suggest that the factors which are associated with the secularization hypothesis, e.g., lower fertility, higher income and increased urbanization, had little or no effect on church attendance in the Western World during the twentieth century. Instead, they relate the decline in religiosity to the growth of the welfare state. Before the 1960s, individuals would look to churches to obtain welfare services and insurance against adverse consumption shocks. Afterwards, those individuals for whom personal religion did not have any meaning stopped attending church because the welfare state provided them with a secular alternative for receiving affordable education and healthcare benefits.

The remainder of this article is as follows. Section 2 presents the data. Section 3 discusses the empirical methodology. Section 4 presents our main results. Section 5 provides additional analyses of religious trends among both female and male Protestants and Catholics. Section 6 concludes.

## **2. Data**

In this section, we first present the ISSP data on church attendance in the twentieth century. These data suggest that religiosity declined in Western European countries, as well as in the USA and in Canada.

We then discuss our explanatory variables in light of the secularization hypothesis and of the religion-market model. In the Appendix, Table A1 provides definitions for the variables used in this study, while Table A2 presents descriptive statistics.

### 2.1. Long-run data on church attendance

Recent polls conducted by the International Social Survey Program (ISSP) allow us to reconstruct long-run church attendance trends in 30 different countries between 1925 and 1990, including the ten countries which constitute the focus of this study: Canada, Denmark, France, Ireland, the Netherlands, Norway, Sweden, Switzerland, the UK and the USA.

The rationale for only using data from these ten countries is straightforward: they were democracies throughout the twentieth century.<sup>4</sup> As such, they did not undertake policies to encourage or discourage church attendance, unlike some twentieth-century dictatorships.<sup>5</sup> In addition, these ten countries have historically been Christian, i.e., Roman Catholic and Protestant, and we exclude from our study the respondents who

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<sup>4</sup> These ten countries obtain a positive score on the democracy index in the Polity IV-dataset (see Marshall and Jaggers, 2009). Still, it must be noted that four countries in our sample, i.e., Denmark, France, the Netherlands and Norway, came under the occupation of Nazi Germany between 1940 and 1944 and were governed during those years by puppet regimes. However, none of these governments, and not even the *Vichy* regime in France which had extensive ties to parts of the French Catholic clergy, launched major campaigns to either encourage or discourage church attendance (see Wormser, 1971, on the ideological links between the Catholic Church and the *Vichy* regime). Therefore, we consider that these four countries were democratic regimes throughout the twentieth century. In any case, it may be argued that all the democratic countries which took part in World War II were not “democratic” since they severely restricted civil liberties during the war. For instance, the British government suspended the *Habeas Corpus* while the US government interned Americans of Japanese origin. Note that in an appendix which is available upon request, we run the regressions without Denmark, France, Netherlands, Norway and find that the results are unchanged.

<sup>5</sup> Twentieth-century dictatorships like Fascist Italy, Nazi Germany and Communist Russia all discouraged church attendance. Because the long-term effect of these anti-religious policies is unknown, it is best not to include these countries in our study. On the views of German Nazis and Italian Fascists vis-à-vis Christian churches, see among others Nolte (1963). See Conquest (1968) and Troyanovsky (1991) on religion in the USSR.

identified themselves with non-Christian denominations, e.g., Buddhism, Judaism or Islam. While few, if any, non-Christian countries were democracies throughout the twentieth century, it is important to grasp the rationale for such a restriction: church attendance is crucial to Christian identity, while in other religions, e.g., Judaism, service attendance can be less central to religious identity.

#### 2.1.1. Retrospective data on church attendance

The retrospective approach in the 1991 and 1998 ISSP surveys asked the following:

- 1) “[W]hen you were around 11 or 12, how often did you attend religious services then?”
- 2) “When you were a child, how often did your father attend religious services?”
- 3) “When you were a child, how often did your mother attend religious services?”

Replies were coded into standard categories, ranging from “never” to “several times each week.” The respondents were also asked about their denominational affiliation and that of their parents when they were growing up.

When 41-year-old respondents answer these questions they are describing events that date back thirty years. More generally, the N-year-old respondents in the 1998 ISSP provide information for the year 1998-N+12 and those in the 1991 ISSP provide information for 1991-N+12. Taken as a whole, the ISSP data thus constitute a massive retrospective survey of church attendance running from the 1920s through the 1990s.

Before turning to the problems that may afflict retrospective data in general, it is worth pointing out that the ISSP questions pertain to habits, which are less subject to errors than inquiries about precise actions at a given moment in time.<sup>6</sup>

Nonetheless, it must be acknowledged that errors are known to influence survey responses and autobiographical memory ((Moss and Goldstein 1979; Rossi, Wright, and Anderson 1983; Rubin 1996; Schwarz and Sudman 1994). These potential problems, which are discussed in detail by Iannaccone (2008), include *social desirability*, where people portray themselves and their parents as both good and “spiritual”. *Conventional wisdom* may also be a problem: if majority opinion holds that people were more pious and religiously active in times past than today, survey respondents may be inclined to apply this image to their own past. *Projection* is also a problem: people may tend to project their current beliefs and behaviors into the past. *Biased recall*, i.e., forgetfulness, also introduces errors in all observations concerning past experience. Finally, it seems likely that all the problems described above tend to increase the retrospective attendance rates reported by older respondents relative to those reported by younger respondents.

Having dwelt upon the potential problems associated with retrospective responses, several advantages should also be noted. Access to times past is, of course, the most obvious advantage. Low cost, relative to panel studies or repeated cross sections, is another. Consistency across time periods is yet another advantage. In addition, retrospective responses are preferable to time series inferences from repeated cross-

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<sup>6</sup> Asking about church attendance is similar to inquiring about a daily or weekly action, e.g., the mode of transportation one would use to go to school when one was 12 years old. There is almost no uncertainty about the validity of the answer.



sections which are often marred by year-to-year variation in dozens of factors, including sampling procedures, interview methods, question wording, exogenous events, and socio-economic trends. Even minor changes in response categories or question order can substantially shift the aggregate results between split samples of an otherwise identical survey. In particular, recent studies confirm that relatively minor changes in question wording, context, or response categories substantially alter average responses to church attendance questions. Researchers likewise suspect that the long-run decline in survey response rates (from the high 80% range in the 1940s and 1950s, down to the 40% range today) may have induced some spurious trends in attendance estimates. Panel studies add to these problems a steady and non-random attrition in the pool of original respondents, making samples progressively less representative over time.

A retrospectively generated time-series is, by contrast, derived from a single set of responses to a single survey administered during a single span of time. Particularly when seeking to estimate aggregate time trends, this consistency may more than offset the problems of age effects, memory lapses, projection, and so forth.

Moreover, Iannaccone (2008) demonstrates the accuracy of the ISSP data in five different ways: (1) by reviewing general findings from the large literature in psychology and survey research concerning autobiographical memory and retrospective reporting; (2) by reviewing the results of a specific study that uses retrospective survey questions to estimate trends in political affiliation; (3) by analyzing retrospective attendance data for evidence of internal consistency; (4) by evaluating the intertemporal and cross-sample consistency of retrospective religious responses derived from different surveys and different periods; and (5) by comparing retrospective attendance rates to those obtained

from non-retrospective sources. All five approaches strongly affirm the value of the ISSP data.

### 2.2.2. Trends in church attendance

Based on the answers of the survey respondents, we compute estimated attendance estimates. As we explain in Appendix 1, these estimates are midpoint predictions derived from a series of overlapping regressions and are computed in each country for the survey respondents (the *Children* variable) and their parents (the *Parents* variable) at 5-year intervals between 1925 and 1990.<sup>7</sup> Figure 1 plots these attendance rates for the 10 countries in our sample.

[Figure 1 here]

Let us first examine the quality of our data by focusing on the USA, Ireland and Norway. These three countries are known for stable, but dramatically different, levels of attendance. America's reputation for religiosity dates back to the nineteenth century, and beginning with the Gallup polls of the 1940s, U.S. surveys have consistently found attendance rates around 40% per week (Finke 1992; Greeley 1989). At the same time, the U.S. data suggest an important *deviation* from stability – a downturn in childhood attendance starting in the mid-1960s and converging to parental rates by the mid-1980s.<sup>8</sup>

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<sup>7</sup> In each country the attendance rate of *Children*, i.e., of the ISSP survey respondents, is usually higher than that of their *Parents*. This is surely because children went to church without their parents, when attending Sunday school for instance.

<sup>8</sup> The October 2001 edition of *Religion Watch* (Cimino, 2001) cites recent studies that document large declines in Sunday school attendance in the United Church of Canada and the Church of England over the past few decades. The estimates of church attendance shown in Figure 1 confirm that the decline (both relative to parents and absolutely) has indeed been very sharp in these countries. The retrospective decline for U.S. youth is confirmed in part by Gallup and Lindsay (1999, 160), who report a teenage attendance

As shown in Figure 2, researchers on religiosity in the USA, e.g., Finke and Stark (2005), have long been aware that this downturn did not coincide with the increase in college enrollment that the 1944 GI Bill made possible. Instead it took place as welfare state programs, such as Medicare, Medicaid and the “War on Poverty”, were developed during the 1960s under the presidencies of John Fitzgerald Kennedy and Lyndon B. Johnson.<sup>9</sup>

[Figure 2]

Like our ISSP data, repeated polls confirm Ireland’s status as Europe’s most devoutly Catholic country – home to the only population with weekly attendance rates on the order of 90% (Barrett 1982). Norway is, by contrast, a bastion of *non*-observance, with current rates of attendance well below 10% and historical statistics that suggest only marginally higher rates earlier in the twentieth century (Barrett, 1982).<sup>10</sup>

Compared to the USA, Ireland, and Norway, the nations of Great Britain and the Netherlands provide more informative tests of the retrospective method. In Britain, for example, scattered surveys and church membership statistics suggest steady and substantial decline in rates of adult religious participation throughout the twentieth century (Bruce 1995; Gill, Hadaway, and Marler 1998; Smith 1993). And this is what we

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rate of 70% for 1959-1961 in contrast to a 50% for 1988-1993. We find further evidence of ongoing decline in youth attendance rates based on the analysis of data from the 1976 – 1992 “Monitoring the Future” surveys of American High School seniors (Bachman 1997).

<sup>9</sup> The Servicemen’s Readjustment Act of 1944, commonly known as the GI Bill of Rights, was signed by Franklin D. Roosevelt on 22 June 1944. It financed education and training programs for an estimated 7.8 million WWII veterans when it was ended in July 1956.

<sup>10</sup> In the USA, three independent sets of annual (semi-annual) surveys consistently poll people about their religious beliefs and behavior: Gallup Opinion Polls starting in 1939, the National Election Studies starting in 1952, and the General Social Surveys starting in 1972. Surveys of religion in Ireland and Norway begin later, occur less often, and employ less consistent questions and samples.

observe in Figure 1, coupled with a far more dramatic decline in childhood rates of participation. In the Netherlands, the decline arrived more suddenly and proceeded more rapidly. The data reviewed by Laeyendecker (1995), Lechner (1996), Sengers (2001), and others identify the 1960s as a period of crisis for the Catholic Church, after which Dutch religious activity trends sharply downward. Figure 1 shows that the retrospective data capture the both the timing and severity of this turning point. Moreover, by separately calculating the trends for Catholics and non-Catholics, one immediately discovers that Catholics do indeed account for more than three-quarters of the observed decline, as we discuss below in Section 5.<sup>11</sup>

From what was previously deemed single-period data, the retrospective method has accurately derived five different historic profiles spanning sixty years or more. The profiles include a decisive turning point (restricted to the Catholic portion of the Dutch population), a case of long term decline (in Great Britain), and examples of relatively long-term stability – at high, low, and intermediate levels of attendance.

We have thus seen that retrospective data capture an astonishing range of religious turns and trends, from the piety of Ireland to the secularity of Scandinavia. The estimates which we graph in Figure 1 vary too much to be artifacts of a simple bias; they mirror documented trends in the USA and Great Britain, as well as partially-documented

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<sup>11</sup> Catholics constitute a little less than half of the Dutch population. For 5-year intervals running from 1930 through 1985, Iannaccone (2008) estimates their attendance rates as: 81%, 82%, 84%, 82%, 82%, 79%, 81%, 79%, 72%, 55%, 46%, 48%. The decline is entirely concentrated in the years 1965 through 1980, and greatly overshadows the decline among non-Catholics, for whom the corresponding sequence from 1930 through 1985 is: 43%, 42%, 40%, 45%, 45%, 44%, 42%, 38%, 34%, 34%, 32%, 36%. For more Catholic versus non-Catholic effects and the critical period of the mid-60s through 70s, see Iannaccone (2008).

trends in Scandinavia, Ireland, and most other Western nations. They can thus be used to explain the decline in religiosity during the twentieth century.

## *2.2. The causes of the decline in church attendance: the secularization hypothesis and the religion-market model*

To test the competing explanations for the decline in church attendance during the 1900s, we rely upon several explanatory variables from various sources, i.e., Carter et al. (2006), Flora (1983), Maddison (2003), Mitchell (2007a, 2007b), the Organization for Economic Cooperation and Development (OECD) statistics database as well as national databases made available by each country's bureau of statistics.

### 2.2.1. Income

The secularization hypothesis suggests that higher income entails a decrease in religiosity. Therefore we compute for each country the logarithm of the Gross Domestic Product (GDP) per capita, which we denote *Log GDP per capita*, and expect it to be negatively correlated with church attendance.

The religion-market model would however suggest that the growth in GDP per capita would have no effect on religious observance. This is because in democracies, individuals attend church services because they expect to benefit from social services, such as education or health care, which remain very expensive despite the increase in income per capita that occurred in Western countries during the twentieth century.

### 2.2.2. Human capital

The secularization hypothesis and the religion-market model offer competing hypotheses to explain the effects of high human capital accumulation on religiosity. The secularization hypothesis predicts that an increase in human capital, measured by higher

education levels and lower fertility, decreases religiosity. It notably contends that individuals with high levels of education are unlikely to believe in the transcendental beliefs that are associated with Christianity – as well as with other religions. Furthermore, as individuals become more educated, they have fewer children: this decline in fertility should also decrease religiosity.

However, the religion-market model would suggest that there is no straightforward relationship between education, fertility and religiosity. For instance, McCleary and Barro (2006a) show that church attendance increases with education.

Besides, it is also not clear whether the decline in religiosity during the twentieth century can be attributed to the technological advances and scientific discoveries which took place after 1900. It would indeed seem that Einstein's relativity theory and the personal computer are less of a challenge to faith than nineteenth century theories such as Darwin's evolution theory and the documentary hypothesis.<sup>12</sup> In addition, it seems unlikely that these nineteenth-century discoveries, which some view as questioning the very basis of religion, would only have an impact after 1900.

In this study, in order to test the competing hypotheses of secularization theory and of the religion-market model regarding human capital, we collect data on fertility and education. Our measure of fertility, denoted *Births*, is the number of births per women in each country; our two measures of education are *Secondary Education*, which measures the share of individuals attending high school in the population, and *Post-Secondary Education*, which assesses the share of individuals in the population attending

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<sup>12</sup> The documentary hypothesis originates in the research of German scholar Julius Wellhausen (1844-1918) who suggested that the Pentateuch is not of the work of a single author (Moses) but is a compilation which draws on four different sources.

universities or equivalent post-secondary learning institutions.<sup>13</sup> If the secularization hypothesis is correct, both the decrease in fertility and the rise in the number of high-school and college students should explain the decline in religiosity.

### 2.2.3. Urbanization and industrialization

If economic development decreases religiosity as the secularization hypothesis predicts, then countries where a growing share of the population works in industry, which we assess with the *Industries* variable, should become more secular. And since industrialization usually goes hand in hand with urbanization, we should also find that countries where an increasing share of the population lives in urban areas, which we measure with the *Urban* variable, become more secular.

The religion market model however makes opposite predictions. It points out that in rural areas, there are tightly-knit communities where individuals can rely on each other for support. However, in urban areas, individuals seeking relief would turn to religious institutions that provide charitable services.<sup>14</sup> This would increase church attendance.

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<sup>13</sup> We focus on high-school and college students because the size of these groups of individuals significantly increased during the twentieth century. Indeed, it would not be relevant to use data on primary schooling or on pupils in junior-high because education until the age of 13, 14 or 15 had become mandatory in most of the countries in our sample by the end of the nineteenth century.

<sup>14</sup> The charitable activities of the churches towards workers in industrial areas can notably be seen in the “social tradition” of the Catholic Church, which can be traced back to the beginning of the nineteenth century, and which was given a new impetus when Pope Leo XIII published in 1891 the *De Rerum Novarum* encyclical. It laid out the so-called “social doctrine” of the Church, which encouraged Catholics to help workers and alleviate their hardships in the new industrial era. This movement was particularly active in France as Duroselle (1951) and Rollet (1958) discuss.

As such, the secularization hypothesis predicts that the coefficients of the *Urban* and *Industries* variables are negative while the religion-market model suggests they are positive.

#### 2.2.4. The welfare state

While the secularization hypothesis, as a “demand-driven” theory of religiosity, does not have any specific predictions on the effects of public spending on church attendance, the religion-market model does. It suggests that the increase in public spending which took place during the twentieth century is the major cause of the decline in religiosity. It lowered charity donations to churches (Gruber and Hungerman, 2007, Hungerman, 2005, 2009) and as a result, limited their charity endeavors. Such an increase in public spending therefore made church attendance less valuable, all the more so as parishioners could henceforth obtain from the welfare state the health-, old-age and education-related services which they previously received from churches.<sup>15</sup>

The religion-market model therefore predicts a negative relationship between religiosity and the four measures of public spending associated with the welfare state in our sample. On the one hand, we use the *Govt-Spending-Education* and *Govt-Spending-Health* variables, which respectively represent the share of education- and health-related

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<sup>15</sup> As a counter-argument to the religion-market model, Inglehart and Norris (2004) contend that the increase in welfare state spending, and the resulting decrease in religiosity, may be regarded as supporting the secularization hypothesis. They view the welfare state as a side-effect of economic growth which increases what they call “existential security”. However, this argument does not appear very sensible as the whole concept of “existential security” seems unrealistic. It might be acceptable if medicine had made such progress that there was no disease in this world, i.e., if there was not any need for the welfare services of the church or the state anymore. But it does not seem that individuals feel more secure when the State, rather than private firms, provides health care (and this can be seen in the current debate about health care reform in the U.S.).



expenditures in the country's total public expenditures. On the other hand, we employ the *Govt-Spending-Family* and *Govt-Spending-Old-Age* variables, which measure the share of family- and old age-related expenditures in the country's GDP. These four variables capture the scope of public spending and allow us to assess its effects on church attendance in our econometric analysis.

### 3. Econometric methodology

#### 3.1. Baseline specification

To find the determinants of the decline in religiosity during the twentieth century, we run the following regressions

$$Children_{c,t} = \alpha_c + \alpha_t + \beta X_{c,t} + \varepsilon_{c,t} \quad (1)$$

and

$$Parents_{c,t} = \alpha_c + \alpha_t + \beta X_{c,t} + \varepsilon_{c,t} \quad (2)$$

where the  $Children_{c,t}$  and  $Parents_{c,t}$  variables respectively measure the church attendance rates of our survey respondents and of their parents in country  $c$  in year  $t$  as computed from the ISSP polls,  $X$  is a vector of explanatory variables and  $\varepsilon$  is an error term such that  $\varepsilon \rightarrow N(0, \sigma^2)$ . Given the possibility of country-level time-invariant unobserved characteristics, which could be correlated with omitted factors, as well as to account for time trends, we include country- and year-fixed effects, respectively denoted  $\alpha_c$  and  $\alpha_t$ , in Equations (1) and (2).

The specification of Equations (1) and (2) raises two issues: reverse causality and the persistence of religious attendance over time. This leads us to investigate endogeneity concerns and the possible existence of a lagged dependent variable in the regressions.

### 3.2. Reverse causality

Endogeneity, in the form of reverse causality, may be an issue in our regressions. This is because we assume that religiosity is influenced by the set of factors discussed in section 2.2, but it cannot be excluded that causality runs in the opposite direction (see Iannaccone 1998, McCleary and Barro, 2006b). Namely, Equations (1) and (2) are only valid if the following condition holds

$$\text{Cov}(X_{c,t}, \varepsilon_{c,t})=0, \forall t, \forall c \quad (3)$$

Reverse causality is however an issue for some, but not all the variables in this paper. There is indeed no study, to the best of our knowledge, which contends that the decrease in religiosity triggered urbanization and industrialization. For instance, no study claims that the industrial development was slower in France than in Germany or in Great Britain during the nineteenth century because of differences in the level of religiosity between these three countries.<sup>16</sup> Furthermore, it does not seem reasonable to argue that lower religiosity would lead more individuals to attend high school or university. Rather, it would seem that economic growth and higher public spending likely entailed an increase in the number of college students.<sup>17</sup> And it must be noted that universities were first created during the Middle Age as places of religious learning.

Still, our study posits that the *Log GDP per capita* and *Births* variables influence religiosity, but we cannot rule out that there is a causal relationship from religiosity to fertility and GDP per capita. For instance, Guiso et al. (2003) suggest that religious belief

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<sup>16</sup> Issues pertaining to the delayed industrialization of France in the nineteenth century are surveyed by Grantham (1997).

<sup>17</sup> Since our regressions include a measure of wealth, i.e., GDP per capita, our regressions are not biased by another form of endogeneity, i.e., by an omitted variable bias.

is positively correlated with behaviors conducive to economic growth while Gruber (2005) shows that higher church attendance in the U.S. is positively correlated with several economic outcomes, including higher levels of income.

Furthermore, we assume in this study that the growth in the welfare state, which we assess through the *Govt-Spending-Education*, *Govt-Spending-Health*, *Govt-Spending-Family* and *Govt-Spending-Old-Age* variables, has an impact on church attendance. However it has been argued that religiosity can have an impact on individual tastes for redistribution (Scheve and Stasavage, 2006a, 2006b).<sup>18</sup> Consequently, it is possible that a growing share of secular individuals wanted the State to play a greater role in the provision of welfare services at the expense of churches.

To solve the problems raised by reverse causality, we rely on the Two-Stage Least Squares (2SLS) approach. This method overcomes the reverse causality issue with instrumental variables (IVs) so that all covariates are independent of  $\epsilon_{c,t}$ . Note however that there are many explanatory variables that are potentially endogenous in our regressions which can lead to unreliable estimates. As such, for our robustness checks, we will run two types of 2SLS regressions: in the first type, we assume that *Births* and *Log GDP per capita*, which influence the demand for religiosity, are endogenous while *Govt-Spending-Education*, *Govt-Spending-Health*, *Govt-Spending-Family* and *Govt-Spending-Old-Age*, which assess the growth of the welfare state, are exogenous; in the

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<sup>18</sup> However studies on the development of the welfare state (see Barr, 1993, chap. 2, and the references therein) emphasize the Great Depression and WWII, rather than lower church attendance, as the driving forces behind the increase in public spending during the 1950s and 1960s. On the determinants of social redistribution across societies, see among others Alesina et al. (2001), Corneo and Gruner (2002) and Luttmer (2001).

second type of regressions, we consider that *Govt-Spending-Education*, *Govt-Spending-Health*, *Govt-Spending-Family* and *Govt-Spending-Old-Age* are endogenous while *Births* and *Log GDP per capita* are exogenous.<sup>19</sup>

To instrument for the *Log GDP per capita* variable, we employ the *Tariff* and *Strike* variables. The *Tariff* variable is a ratio measuring the average tariff duties over imports as computed by Clemens and Williamson (2004). While their study shows that the correlation between GDP growth and tariffs has changed over time, they do not suggest that this change may be explained by the decline in church attendance. More generally, religiosity is not a factor that is taken into account by both theoretical studies (Hillman, 1989, and Grossman and Helpman, 2002) and empirical research (Costa Tavares, 2007) on tariff formation.

Our additional IV for *Log GDP per capita* is *Strike*, which assesses the work days lost per worker as a result of strikes. While strikes obviously have a negative effect on GDP, they do not seem to be correlated with church attendance. Indeed, studies on the causes of strikes, e.g., Kennan (1987), Cramton and Tracy (1992), Cramton et al. (1999), suggest that demands for higher wages and better working conditions, rather than high or low religiosity, make workers go on strike.

Moreover, to instrument for the *Births* variable, we rely upon the *Interest Rate* and *Exchange Rate* variables from Bordo et al. (2001)'s dataset. These variables respectively assess the real interest rate on long-term government bonds and the exchange rate between the US dollar and the other countries' currency. Both variables have been shown

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<sup>19</sup> As an additional limitation to our IV approach, some of the values for our IVs are missing, thus leading to a reduction of the number of observations in some of our robustness checks.

to be correlated with fertility: Becker and Barro (1988) notably demonstrated how fertility would depend on the interest rate in an open economy, while recent empirical research by Rose et al. (2009) found a link between fertility and the exchange rate. However, we are not aware of any instance where the interest rate, the exchange rate, and more generally monetary policy, were influenced by religiosity or by churches in the countries which we study during the twentieth century.<sup>20</sup>

Finally, we also instrument for the welfare state variables, i.e., *Govt-Spending-Education* and *Govt-Spending-Family* on the one hand and *Govt-Spending-Health* and *Govt-Spending-Old-Age* on the other hand. First we employ the *Strike* variable which we defined above. This is because welfare states usually have rigid labor laws which boost the power of unions and increase the likelihood of strikes. Moreover, these rigid labor laws create inefficiencies in the labor market which increase unemployment. Therefore we use the *Unemployment* variable as an additional IV, which we define as the logarithm of the unemployment rate in each country. At the same time, it is unlikely that unemployment would be correlated with low or high religiosity in a systematic manner.<sup>21</sup>

In addition, we also use as an IV the *Net Immigration* variable which measures the difference between the number of immigrants and emigrants in a country. The presence of a developed welfare state is likely to encourage emigration from high-skilled workers

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<sup>20</sup> In other words, if we were to carry out a study on religiosity in the Middle Ages, we could not use the interest rate as an IV because of the Churches' policies on interest rate loans. See Glaeser and Scheinkman (1998) and Rubin (2009) for analyses of interest rates bans.

<sup>21</sup> A group of Orthodox Jews, called *Haredim*, constitute the exception to this rule. As documented by Berman (2000), they live in poverty in Israel because the Israeli government provides them with public subsidies to maintain their religious lifestyle. However, in the United States and Western Europe, *Haredim* do not live off the welfare state.

and immigration from low-skilled workers in a given country. At the same time, it seems that *Net Immigration* is not correlated with religiosity. Indeed, in the countries in our sample, neither Catholics nor Protestants were persecuted during the twentieth century because of their religious beliefs. In other words, migration decisions resulted from economic motives, not religious ones.

Finally, and in spite of the justifications which we give in this section when describing our IVs, it must be acknowledged that religion is sometimes regarded as an encompassing phenomenon which explains nearly all of human activity. If this view is correct, there can be no relevant IV in our study. This is why we rely in the next section on the Arellano-Bond (1991) two-step difference GMM model that allows us to estimate our regressions without relying on IVs.

### *3.3. The persistence of religious attendance*

The second concern regarding Equations (1) and (2) pertains to the delay with which economic changes influence religiosity. Both Equations suggest that a change in economic circumstances has an immediate effect on church attendance. However, it is possible that changes in religiosity occur slowly. For instance, a sudden governmental increase in welfare spending may not have an impact on the religiosity of old parishioners who already benefit from the social services of churches. It may however have an effect on the level of church attendance of young individuals who could send their children to state-funded schools instead of parochial schools.

Therefore, to take into account the possibility that economic changes may have a delayed effect on church attendance, we introduce a lagged dependent variable in Equations (1) and (2)

$$Children_{c,t} = \alpha_c + \alpha_t + \beta X_{c,t} + \gamma Children_{c,t-1} + \varepsilon_{c,t} \quad (4)$$

and

$$Parents_{c,t} = \alpha_c + \alpha_t + \beta X_{c,t} + \gamma Parents_{c,t-1} + \varepsilon_{c,t} \quad (5)$$

where  $Children_{c,t-1}$  and  $Parents_{c,t-1}$  are the lagged dependent variables and the other variables were defined above in Equations (1) and (2).

While Equations (4) and (5) cannot be estimated with a pooled OLS estimator (Greene, 2008), the fixed effects OLS estimator can be consistent when the number of time periods in the sample increases, i.e., as  $t \rightarrow \infty$  (Wooldridge, 2002). In other words, we can estimate Equations (4) and (5) provided that in Equation (4)

$$Cov(Children_{c,t-1}, \varepsilon_{c,t}) = Cov(X_{c,t}, \varepsilon_{c,t}) = 0 \text{ as } t \rightarrow \infty \quad (6)$$

and that in Equation (5)

$$Cov(Parents_{c,t-1}, \varepsilon_{c,t}) = Cov(X_{c,t}, \varepsilon_{c,t}) = 0 \text{ as } t \rightarrow \infty \quad (7)$$

But beyond these econometric concerns, it is possible that the fixed effects OLS estimator is not appropriate because of reverse causality, i.e., because  $Cov(Children_{c,t-1}, \varepsilon_{c,t}) \neq 0$  or  $Cov(Parents_{c,t-1}, \varepsilon_{c,t}) \neq 0$ . To account for the potential endogeneity of  $Children_{c,t-1}$  in Equation (4) and of  $Parents_{c,t-1}$  in Equation (5), we could theoretically use Anderson and Hsiao (1982)'s 2SLS approach with the IVs discussed in the previous section. However, if estimating Equations (4) and (5) with Anderson and Hsiao (1982)'s 2SLS approach provides consistent estimates, it does not always provide an efficient estimation (Wooldridge, 2002).

Consequently we use the two-step robust variant of the Arellano-Bond (1991) GMM estimator which eliminates unobserved individual specific effects by taking first differences. In this specification, the lagged levels of the dependent and explanatory

variables, which are consistent with the moment conditions, are the instruments for the regression in differences. But since the two-step estimator of the Arellano-Bond (1991) GMM estimator yields standard errors that are biased downwards, we rely upon Windmeijer (2005)'s finite sample correction for the two-step covariance matrix in order to obtain more accurate sample inference.

#### **4. Results**

This section analyzes the results of our regressions. Table 1 presents OLS estimates with year- and country-fixed effects of Equations (1) and (2) while Tables 2 and 3 provide 2SLS estimates of these two Equations. In Table 2 (respectively, Table 3), we assume that the variables driving the demand for religiosity, i.e., *Births* and *Log GDP per capita*, are endogenous (exogenous) while the variables assessing public spending, i.e., *Govt-Spending-Education*, *Govt-Spending-Family*, *Govt-Spending-Health* and *Govt-Spending-Old-Age*, are exogenous (endogenous).

Furthermore, Tables 4 and 5 report estimates of Equations (4) and (5). Table 4 provides OLS estimates with year- and country-fixed effects while Table 5 presents Arellano-Bond (1991) two-step difference GMM regressions with the finite sample correction for the two-step covariance matrix of Windmeijer (2005). In the regressions shown in Table 5, we use the lagged levels of the dependent and explanatory variables, which are consistent with the moment conditions, as the instruments for the regression in differences.

It must be noted that in all the Tables, *Children* is the dependent variable in Columns (1) to (4) while *Parents* is the dependent variable in Columns (5) to (8).

[Table 1] [Table 2 here] [Table 3 here] [Table 4 here] [Table 5 here]



#### 4.1 Wealth and human capital

In all but two regressions of Tables 1 to 5, the *Log GDP per capita* variable does not have any effect on religiosity. In those two regressions where it is significant (in the 2SLS regressions shown in Columns 3 and 7 of Table 3), *Log GDP per capita* is shown to have a positive impact on religiosity. Such a finding obviously constitutes a major invalidation of the secularization hypothesis.

This result also suggests that McCleary and Barro (2006a)'s finding on the negative relationship between GDP growth and religious observance, which they obtained by using data on church attendance in the 1980s and 1990s, does not hold when data going back to the 1920s are included in a panel data specification. In other words, individuals in rich and democratic countries may currently be secular, but there is no reason to believe that they became less observant as their income grew between 1925 and 1990. Actually, such a result would be in line with the historical studies which showed that the dechristianization of Western Europe occurred during the eighteenth and the nineteenth century, i.e., before the rapid growth in GDP per capita that took place during the twentieth century. For instance, the dechristianization of France occurred during the nineteenth century, mainly as a reaction against the political and fiscal powers of the Catholic Church in the wake of the 1789 French Revolution (see Franck, 2009).

Secularization theories also suggest that higher education levels would lead to lower church participation. But McCleary and Barro (2006a) had already remarked that higher levels of education could be associated with higher religiosity. In our study, the *Secondary Education* variable is positive and significant in several regressions (in the regressions shown in Column 1 of Tables 1 and 2, as well as in the OLS regressions

shown in Column 5, 6 and 7 of Table 4) – a finding which corroborates McCleary and Barro (2006a)’s result. However it is negative and significant in two of our regressions (in Column 7 of Tables 1 and 2) – a result which is in line with the secularization hypothesis. Furthermore, the *Post-Secondary Education* variable is not significant in any of our regressions. Hence, while our results on the increase in education during the twentieth century are not in line with secularization theories, they are also not robust enough for us to suggest that they invalidate another prediction of the secularization hypothesis.

Finally, our results also cast doubt on another claim of the secularization hypothesis concerning the systematic relationship between high human capital and low religiosity. Indeed, we find that our measure of fertility (the *Births* variable) only has a positive and significant effect in only one of our regressions (in the Arellano Bond two-step difference GMM in Column 7 of Table 5). Furthermore, this single result, which suggests in line with the secularization hypothesis that a decrease in fertility lowers church attendance, is not altogether inconsistent with the religion-market model. This is because proponents of the religion-market model would suggest that individuals with either few or no children would not attend church since they do not need its social services, such as child day care.

#### *4.2 Urbanization and Industrialization*

The secularization hypothesis has traditionally argued that increased industrialization and urbanization have reduced church attendance. However, the *Industries* variable, which assesses the share of the population working in the industrial sector, has a positive and significant coefficient in almost all the OLS regressions in

Table 1. Most of our robustness checks in Tables 2 to 5 confirm the positive and significant sign of *Industries*. Furthermore, the *Urban* variable has a positive and significant coefficient in several OLS regressions of Table 1, as well as some of the 2SLS regressions in Table 3.

Hence, these results fail to confirm the predictions of secularization theories, which contend that urbanization and industrialization have a negative effect on religiosity. At the same time, they are consistent with the claims of the religion-market model, as most regressions suggest that industrialization and urbanization increased church attendance. In any case, the main vindication for the religion-market model should come from the regression results on the effects of welfare spending on religiosity.

#### *4.3 Public spending on welfare services*

The OLS regressions in Table 1 suggest show that the growth in public spending on education led to a decline in religiosity. When a lagged dependent variable is introduced in those OLS regressions, both the growth in public spending on education and the growth in old-age expenditures decreased church attendance as can be seen in Table 4.

More precisely, our regressions in Tables 1 and 4 indicate that a one percent increase in the share of education-related expenditures in the country's total public expenditures (*Govt-Spending-Education*) decreased the religiosity of our survey respondents (the *Children* variable) by an estimated 0.411% to 0.887% on average and of their *Parents* by 0.323% to 0.591%. Interestingly enough, our results regarding the impact of public spending on education are in the same order of magnitude as the findings of Gill and Lundsgaarde (2004). In a cross-section of countries in 1995, they

found that a one-percent increase in the share of government social welfare expenditures in GDP on a per capita basis decreases church attendance by an estimated 0.275% to 0.626%. Furthermore, we find in Tables 1 and 4 that a one percent increase in the share of old age-related expenditures in the country's GDP (*Govt-Spending-Old-Age*) lowered church attendance of the *Children* by an estimated 4.497% on average and of their *Parents* by 3.5% to 7.8%.

The additional 2SLS and Arellano-Bond GMM regressions that we show in Tables 2, 3 and 5 confirm the negative effect of the welfare state on church participation. They thus suppress the religion-market model, which argues that religious participation is supply-driven, i.e., governmental interventions in religious affairs have a major impact on church attendance. In the next section, we examine whether those who stopped attending church were mostly male or female, and/or mostly Catholic or Protestant.

### **5. Who stopped attending church during the twentieth century?**

In order to refine our analysis of church attendance, we now compute estimated attendance rates based on the answers of the survey ISSP respondents by breaking them down between gender and denomination. This procedure's advantage is that it allows us to distinguish the potentially different effects of economic growth and of the welfare state on the church attendance of men, women, Catholics and Protestants.<sup>22</sup> Its inconvenient is

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<sup>22</sup> In this study, we do not distinguish between the different Protestant denominations. Because there is usually one Protestant denomination in each European country, potential differences, for instance between Lutheran and Calvinist churches, are taken into account by country-fixed effects. It is only in the USA that there are many large Protestant denominations. In the USA, there is a long-standing debate as to the relative

that it reduces the sample of countries which we can study in some of the regressions. This is because there are no *Catholics* in Denmark, Norway and Sweden and no *Protestant Children* in Ireland. Furthermore, some years are missing for some categories as we go further back in time, thus restricting the number of observations and lowering the degrees of freedom. In any case, we decided not to include in our analysis estimated rates of church attendance which were based on less than 50 respondents (which leads us not to use data on *Protestant Mothers* and *Protestant Fathers* separately in Ireland). The descriptive statistics are given in Table A2, while Figures 3 and 4 graph these computed rates for each country.

In Figure 3, we distinguish the church attendance rates of male children (*Sons*), male parents (*Fathers*), female children (*Daughters*) and female parents (*Mothers*); in Figure 4, we distinguish between *Catholic Children*, *Catholic Parents*, *Protestant Children* and *Protestant Parents*. Both Figures show that the religiosity of all these different groups progressively declined during the twentieth century.

[Figure 3 here] [Figure 4]

With these church attendance rates, we rerun OLS regressions of Equations (1) and (2) which we report in Tables 6 to 13. These Tables are similar to Table 1 but for the dependent variables: *Catholic Children* and *Catholic Parents* in Table 6, *Protestant Children* and *Protestant Parents* in Table 7, *Daughters* and *Mothers* in Table 8, *Sons* and *Fathers* in Table 9, *Catholic Sons* and *Catholic Fathers* in Table 10, *Catholic Daughters*

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decline of “liberal” and “conservative” Protestant churches, but it would nonetheless seem that all Protestant churches lost parishioners after the 1960s (see Finke and Stark, 2005).

and *Catholic Mothers* in Table 11, *Protestant Sons* and *Protestant Fathers* in Table 12, and *Protestant Daughters* and *Protestant Mothers* in Table 13.<sup>23</sup>

[Table 6] [Table 7 here] [Table 8 here] [Table 9 here]

[Table 10] [Table 11 here] [Table 12 here] [Table 13 here]

Our regressions in these Tables confirm the findings in Tables 1 to 5. Fertility, wealth and education are shown not to have any effect on religiosity. However, urbanization and industrialization have a positive impact on church attendance, especially for male Catholics in Table 10 and female Catholics in Table 11. Such a result obviously is in line with the historical evidence, mentioned in Section 2.2.3, concerning the actions of the Catholic clergy and laity in accordance with the social doctrine of the Catholic Church which sought to help workers in the new industrial era. It is also consistent with the predictions of the religion-market model which argues that individuals who moved to urban centers would rely on religious welfare services since they could not benefit anymore from the networks of tightly-knit rural communities.

Our results in Tables 6 to 13 also confirm the observations which we made above about Tables 1 to 5: the increase in public spending on education and old-age decreased the religiosity of all the groups in our study. It is however worth pointing out that our findings indicate that the effects of the welfare state are larger for the survey respondents than for their parents, i.e., for younger than for older individuals, for women than for men, and more systematic for Catholics than for Protestants.

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<sup>23</sup> Additional regression results, which provide for each dependent variable 2SLS and Arellano-Bond two-step difference GMM regressions, are available upon request to the authors.

At this point, it is important to emphasize that the results in both Sections 4 and 5 do not suggest that religious participation is never demand-driven. Instead, they imply that in the countries which were democracies during the twentieth century, and where religious participation was neither encouraged nor discouraged, the decline in religious participation cannot be attributed to the factors which the secularization hypothesis has usually associated with lower religiosity, i.e., higher income, lower fertility and higher levels of education.

Indeed, what changed in Western countries during the twentieth century was the development of the welfare state. It crowded out the charitable activities of the churches and made religious participation less beneficial.<sup>24</sup> It changed the supply conditions of religious activities which became less complementary, if not fully orthogonal in some countries like France and Norway, to the provision of welfare services.

Thus our results, which show the negative impact of the welfare state on religiosity, are in line with the predictions of economic theory concerning the behavior of rational agents: when an activity, namely church attendance, becomes less valuable, fewer self-interested rational individuals take part in it. Furthermore, our findings, which also indicate that the effect of public spending is larger on the religiosity of young individuals than on that of old individuals, are in line with the rational behavior of agents who are dynamic optimizers. In our case, young individuals keen on pursuing high school and college studies understood that the welfare state allowed them not to attend church;

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<sup>24</sup> Before the development of the welfare state, churches would not necessarily exclude non-parishioners from their hospitals and schools, but undoubtedly granted preferential access to attendees and their children.

older parishioners who had been going to church throughout their lives would obviously be less influenced by such an increase in public spending.

Obviously, such a perspective on religiosity implies an instrumental view of religious participation. This is not to suggest that all the individuals who ever went to Church only did so because of the welfare services which they expected to receive in return.<sup>25</sup> Nonetheless, our results do suggest that a sizeable fraction of religious participants were motivated by the churches' provisions of education and health, and left when the welfare state crowded out religious charities.

## **6. Conclusion**

This article provides a test of the secularization hypothesis and of the religion-market model by relying upon the retrospective questions of the 1991 and 1998 ISSP surveys which yield detailed estimates of religious trends across dozens of countries. These data, which span the 1925-1990 period, fit what we already know about America and greatly extend our statistics on Europe. As such, they allow us to examine the roots of the decline in church attendance which occurred in the Western World during the twentieth century.

Our results provide scant evidence for the secularization hypothesis. They do not support the claims that the growth in income had a negative effect on religiosity. In addition, they fail to find any negative effect of fertility, education, industrialization and urbanization on church attendance.

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<sup>25</sup> Stark and Finke (2000) argue that individuals attend church because churches offer spiritual goods that no secular firm can provide. Nevertheless, it would seem that many (secular) political parties provide goods which rival those of the churches in terms of transcendental beliefs, leaps of faith and personality cults.



Conversely, our findings are consistent with the claims of the religion market model, which argues that governmental interventions have an impact on religious participation. Our results indeed show that there is a “supply-side” to religious participation by providing evidence that the development of the welfare state significantly decreased religiosity. In other words, many individuals were observant because churches funded welfare services which the State did not provide; they became secular when the welfare state crowded out religious charities.

All in all, our results suggest two avenues of research: the first one is policy-orientated while the second is more theoretical in nature. First, there are still countries notably in the Middle East and in Central Asia, where extremist religious movements are pointed out as a major source of political instability and violence. This paper thus suggests that the promotion of a secular welfare state may represent the best way to undermine these movements in the long-run. How this secular welfare state would be financed is an altogether different issue.

Second, while this paper shows that the growth of the welfare state explains the decline in church participation during the twentieth century, it also calls into question the relevance of the factors, like education and wealth, which have traditionally been used to explain the demand for religiosity. As such, this study suggests that other factors, such as habit formation, may perhaps provide a better explanation of the demand for religion.

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Table 1. Determinants of church attendance in the twentieth century: baseline specification.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Children</i>				<i>Dependent variable is Parents</i>			
Log GDP per capita	-0.607 [1.121]	-0.585 [1.120]	-0.051 [1.079]	0.052 [0.819]	-0.442 [0.427]	-0.428 [0.331]	-0.076 [0.557]	0.239 [0.375]
Births	0.611 [2.209]	0.054 [2.542]	-0.998 [4.683]	2.926 [5.037]	0.767 [1.135]	0.441 [1.183]	-0.434 [2.495]	2.536 [3.550]
Industries	0.84 [0.303]**	0.768 [0.374]*	0.607 [0.256]**	0.596 [0.298]*	0.338 [0.109]**	0.296 [0.100]**	0.116 [0.128]	0.178 [0.133]
Urban	0.148 [0.097]	0.158 [0.104]	0.331 [0.107]**	0.222 [0.080]**	0.07 [0.080]	0.076 [0.084]	0.151 [0.120]	0.118 [0.110]
Secondary Education	0.04 [0.020]*	0.029 [0.026]	0.02 [0.026]	0.0003 [0.092]	0.018 [0.024]	0.012 [0.019]	0.019 [0.027]	-0.124 [0.057]*
Post-secondary Education	0.077 [0.070]	0.077 [0.072]	0.024 [0.079]	0.052 [0.074]	0.001 [0.056]	0.002 [0.054]	0.005 [0.071]	0.009 [0.062]
Govt Spending - Education	-0.591 [0.157]***	-0.54 [0.184]**			-0.441 [0.145]**	-0.411 [0.136]**		
Govt Spending - Health		-0.105 [0.152]				-0.061 [0.053]		
Govt Spending - Old Age			-1.82 [1.604]	-2.2 [1.520]			-0.486 [0.820]	-1.017 [0.660]
Govt Spending - Family				2.425 [1.522]				0.493 [0.918]
Constant	28.658 [10.560]**	32.182 [13.615]**	14.679 [9.403]	15.043 [12.280]	38.463 [5.173]***	40.527 [6.126]**	27.965 [9.378]**	34.088 [6.657]***
Observations	133	133	92	88	133	133	92	88
Within R <sup>2</sup>	0.757	0.763	0.761	0.747	0.681	0.688	0.544	0.557
F-stat	5.373	8.503	1.879	4.719	5.269	27.925	5.367	40.659
Prob > F	0.004	0	0.21	0.007	0.004	0	0.004	0
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.

Table 2. Determinants of church attendance in the twentieth century: accounting for the endogeneity of the variables

driving the “demand” for religiosity.

	2SLS Fixed Effects (1)	2SLS Fixed Effects (2)	2SLS Fixed Effects (3)	2SLS Fixed Effects (4)	2SLS Fixed Effects (5)	2SLS Fixed Effects (6)	2SLS Fixed Effects (7)	2SLS Fixed Effects (8)
	<i>Dependent variable is Children</i>				<i>Dependent variable is Parents</i>			
Log GDP per capita	-0.199 [0.255]	-0.109 [0.190]	0.0807 [0.535]	-0.0294 [0.234]	-0.245 [0.262]	-0.158 [0.185]	0.627 [1.207]	0.133 [0.182]
Births	-12.73 [10.32]	-8.226 [9.054]	19.52 [44.80]	11.91 [16.71]	-15.44 [10.06]	-10.8 [8.373]	79.26 [102.6]	20.35 [14.07]
Industries	0.684** [0.269]	0.669** [0.280]	0.671 [0.936]	0.504 [0.414]	0.254* [0.144]	0.241** [0.123]	1.076 [2.116]	0.304 [0.282]
Urban	0.696 [0.504]	0.514 [0.378]	0.175 [1.295]	0.307 [0.556]	0.63 [0.526]	0.453 [0.368]	-1.355 [2.947]	-0.222 [0.527]
Secondary Education	0.0472* [0.0283]	0.0295 [0.0239]	0.00665 [0.0906]	0.0102 [0.137]	0.0297 [0.0229]	0.0139 [0.0140]	-0.0934 [0.253]	-0.197** [0.0898]
Post-secondary Education	0.218 [0.140]	0.165 [0.117]	0.0332 [0.235]	0.0995 [0.136]	0.147 [0.121]	0.0948 [0.0917]	-0.168 [0.566]	-0.0206 [0.118]
Govt Spending - Education	-1.050*** [0.299]	-0.908*** [0.226]			-0.838*** [0.270]	-0.702*** [0.186]		
Govt Spending - Health		-0.0966 [0.148]				-0.0827 [0.0939]		
Govt Spending - Old Age			-2.31 [2.335]	-2.123 [1.756]			-4.361 [8.073]	-2.013* [1.155]
Govt Spending - Family				3.216*** [1.239]				0.917 [1.174]
Observations	111	111	84	80	111	111	84	80
Hansen J-test	0.677	1.804	2.734	3.844	0.587	1.036	0.07	1.874
Prob J-test	0.713	0.406	0.255	0.146	0.746	0.596	0.965	0.392
F-test (first stage)	15.183	37.044	13.051	14.256	41.278	69.435	0.314	10.931
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- 2SLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- In these regressions, the *Births* and *Log GDP per capita* variables are endogenous. We employ the *Interest rate*, *Exchange rate*, *Tariff*, and *Strike* variables as IVs.



Table 3. Determinants of church attendance in the twentieth century: accounting for the endogeneity of the variables

driving the “supply” of religiosity.

	2SLS Fixed Effects (1)	2SLS Fixed Effects (2)	2SLS Fixed Effects (3)	2SLS Fixed Effects (4)	2SLS Fixed Effects (5)	2SLS Fixed Effects (6)	2SLS Fixed Effects (7)	2SLS Fixed Effects (8)
	<i>Dependent variable is Children</i>				<i>Dependent variable is Parents</i>			
Log GDP per capita	0.0131 [0.0444]	0.00757 [0.0481]	0.103*** [0.0353]	-0.0287 [0.0946]	0.0233 [0.0390]	0.00805 [0.0463]	0.0626** [0.0250]	-0.00417 [0.0799]
Births	1.788 [4.356]	0.819 [6.051]	-0.715 [19.36]	7.887 [16.64]	-4.137*** [1.216]	-6.833*** [1.629]	3.827 [7.304]	8.184 [12.32]
Industries	0.911 [0.568]	0.927 [0.573]	0.338 [0.746]	0.142 [0.771]	-0.0221 [0.208]	0.0226 [0.320]	0.0671 [0.402]	-0.0318 [0.489]
Urban	0.150* [0.0794]	0.154* [0.0829]	0.239* [0.139]	-0.0094 [0.178]	0.125 [0.0945]	0.137 [0.0883]	0.137 [0.0991]	0.0113 [0.110]
Secondary Education	0.12 [0.0918]	0.118 [0.0908]	-0.2 [0.243]	0.268 [0.412]	0.00359 [0.0573]	-0.000749 [0.0683]	-0.0964 [0.144]	0.141 [0.317]
Post-secondary Education	0.0784 [0.0622]	0.0822 [0.0656]	-0.213 [0.143]	0.136 [0.210]	0.0205 [0.0603]	0.0309 [0.0618]	-0.0531 [0.0897]	0.124 [0.170]
Govt Spending - Education	-0.806 [0.536]	-0.880* [0.460]			0.0319 [0.390]	-0.176 [0.572]		
Govt Spending - Health		-0.0632 [0.210]				-0.176*** [0.0564]		
Govt Spending - Old Age			-8.492** [4.249]	-0.0807 [6.494]			-2.766 [3.301]	1.494 [5.211]
Govt Spending - Family				9.092 [5.672]				4.606 [4.230]
Observations	65	65	55	55	65	65	55	55
Hansen J-test	3.95	3.151	1.667	0.415	3.008	0.826	2.509	1.661
Prob J-test	0.139	0.076	0.434	0.52	0.222	0.363	0.285	0.197
F-test (first stage)	0.782	2.253	6.817	44.204	13.836	90.84	6.753	18.435
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- 2SLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- In these regressions, the *Education*, *Health*, *Old Age* and *Family* variables are endogenous. We use the *Strike*, *Unemployment* and *Net Immigration* variables as IV.

Table 4. Determinants of church attendance in the twentieth century: testing for the persistence of religiosity

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Children</i>				<i>Dependent variable is Parents</i>			
Log GDP per capita	-0.692 [0.722]	-0.698 [0.722]	-0.518 [0.995]	-0.624 [1.061]	-0.529 [0.374]	-0.525 [0.363]	-0.557 [0.546]	-0.398 [0.634]
Births	-1.643 [1.500]	-1.508 [1.439]	-0.744 [2.412]	-1.492 [3.388]	1.158 [0.795]	1.043 [0.681]	1.761 [1.938]	1.222 [2.709]
Industries	0.389 [0.108]***	0.403 [0.135]**	0.016 [0.130]	-0.069 [0.219]	0.223 [0.056]***	0.208 [0.051]***	-0.093 [0.063]	-0.073 [0.092]
Urban	0.14 [0.119]	0.136 [0.114]	0.075 [0.081]	0.058 [0.058]	0.036 [0.044]	0.039 [0.049]	0.036 [0.064]	0.079 [0.049]
Secondary Education	0.024 [0.023]	0.027 [0.028]	0.016 [0.021]	0.057 [0.058]	0.028 [0.012]**	0.025 [0.012]*	0.022 [0.011]*	-0.05 [0.036]
Post-secondary Education	-0.002 [0.055]	-0.004 [0.053]	-0.016 [0.054]	-0.007 [0.043]	0.014 [0.053]	0.014 [0.051]	0.024 [0.044]	0.016 [0.043]
Govt Spending - Education	-0.338 [0.143]**	-0.351 [0.162]*			-0.383 [0.106]***	-0.373 [0.105]***		
Govt Spending - Health		0.035 [0.099]				-0.023 [0.042]		
Govt Spending - Old Age			-1.394 [0.616]**	-1.289 [0.663]*			-0.706 [0.555]	-0.867 [0.574]
Govt Spending - Family				0.021 [1.397]				-0.914 [1.085]
Children <sub>t-1</sub>	0.623 [0.139]***	0.641 [0.150]***	0.862 [0.126]***	0.905 [0.203]***				
Parents <sub>t-1</sub>					0.489 [0.079]***	0.472 [0.089]***	0.778 [0.207]***	0.687 [0.171]***
Constant	-5.451 [11.167]	-7.256 [10.164]	0.996 [4.511]	0.563 [7.192]	9.281 [3.382]**	10.826 [3.934]**	7.305 [6.468]	12.816 [6.974]*
Observations	124	124	92	88	124	124	92	88
Within R <sup>2</sup>	0.872	0.872	0.867	0.859	0.733	0.734	0.7	0.651
F-stat	11.365	19.91	33.927	5.826	11.239	5.048	2.049	0.887
Prob > F	0	0	0	0.003	0	0.005	0.163	0.8
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.

Table 5. Determinants of church attendance in the twentieth century: testing for the persistence of religiosity with the Arellano-Bond two-step difference GMM estimator.

	Arellano-Bond GMM	Arellano-Bond GMM	Arellano-Bond GMM	Arellano-Bond GMM	Arellano-Bond GMM	Arellano-Bond GMM	Arellano-Bond GMM	Arellano-Bond GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	<i>Dependent variable is Children</i>				<i>Dependent variable is Parents</i>			
Log GDP per capita	-0.382	1.193	0.13	0.596	-3.656	1.613	-0.526	3.965
	[1.193]	[2.972]	[5.203]	[2.667]	[2.556]	[3.905]	[6.170]	[6.341]
Births	-8.765	-13.912	3.995	7.696	7.236	-3.352	20.075	39.034
	[11.109]	[11.469]	[10.813]	[21.348]	[15.495]	[6.727]	[5.979]***	[36.566]
Industries	0.508	2.165	0.171	1.358	-0.06	2.056	0.953	2.574
	[0.579]	[0.677]***	[0.942]	[2.798]	[0.650]	[1.375]	[1.058]	[2.812]
Urban	0.169	0.472	0.461	1.16	0.135	0.706	1.052	2.421
	[0.267]	[0.598]	[0.381]	[2.102]	[0.169]	[0.553]	[1.098]	[1.944]
Secondary Education	-0.06	-0.23	0.034	-0.112	-0.007	-0.275	-0.071	-0.29
	[0.049]	[0.167]	[0.096]	[0.280]	[0.050]	[0.190]	[0.065]	[0.458]
Post-secondary Education	0.054	0.049	-0.055	-0.026	0.117	0.097	0.052	-0.193
	[0.111]	[0.172]	[0.101]	[0.161]	[0.066]*	[0.136]	[0.340]	[0.191]
Govt Spending - Education	-0.305	-0.887			-0.323	-1.243		
	[0.368]	[0.470]*			[0.125]**	[0.709]*		
Govt Spending - Health		1.227				0.879		
		[0.550]**				[0.913]		
Govt Spending - Old Age			-4.742	-4.497			-3.515	-7.895
			[2.055]**	[6.073]			[1.767]**	[4.464]*
Govt Spending - Family				-0.563				3.565
				[3.883]				[3.837]
Children <sub>t-1</sub>	0.855	1.046	0.117	0.127				
	[0.385]**	[0.883]	[0.399]	[1.024]				
Parents <sub>t-1</sub>					0.475	1.314	-0.038	-0.432
					[0.549]	[1.302]	[0.621]	[1.864]
Observations	114	114	82	78	114	114	82	78
Hansen J-test	3.414	0.321	2.389	0.215	0.897	0.047	0.996	0.074
Prob J-test	0.491	0.571	0.967	0.643	0.97	0.828	0.802	0.964
AR(1) test	0.214	1.403	0.403	0.299	-1.241	0.76	0.833	0.935
Prob. of AR(1) test	0.831	0.161	0.687	0.765	0.215	0.447	0.405	0.35
AR(2) test	-1.558	-1.408	-1.389	-1.462	-0.948	-0.538	0.598	1.114
Prob. of AR(2) test	0.119	0.159	0.165	0.144	0.343	0.59	0.55	0.265
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- Arellano-Bond (1991) two-step difference GMM regressions with Windmeijer (2005)'s finite sample correction for the two-step covariance matrix with time-fixed effects and robust standard errors clustered by countries.
- Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- In these regressions, the *Children<sub>t-1</sub>* and *Parents<sub>t-1</sub>* variables are endogenous. The lagged levels of the dependent and explanatory variables, which are consistent with the moment conditions, are the instruments for the regression in differences.

Table 6. Determinants of church attendance in the twentieth century for Catholics.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Catholic Children</i>				<i>Dependent variable is Catholic Parents</i>			
Log GDP per capita	1.943 [1.247]	2.363 [0.802]**	3.642 [1.313]**	4.027 [1.148]**	-0.913 [1.072]	-0.465 [0.939]	0.555 [1.161]	1.541 [1.154]
Births	3.564 [2.191]	0.859 [1.447]	-2.091 [5.333]	5.917 [7.970]	1.847 [2.517]	0.985 [2.611]	1.438 [7.664]	6.329 [9.313]
Industries	1.529 [0.455]**	0.885 [0.390]*	1.124 [0.277]**	0.998 [0.438]*	0.956 [0.261]**	0.812 [0.221]**	0.568 [0.085]**	0.695 [0.146]**
Urban	-0.163 [0.545]	-0.058 [0.287]	0.291 [0.419]	0.408 [0.356]	-0.105 [0.444]	-0.123 [0.334]	0.391 [0.389]	0.348 [0.275]
Secondary Education	-0.075 [0.047]	-0.066 [0.037]	-0.073 [0.051]	-0.178 [0.106]	-0.032 [0.050]	-0.028 [0.039]	-0.017 [0.050]	-0.201 [0.099]*
Post-secondary Education	-0.292 [0.151]	-0.14 [0.162]	-0.147 [0.168]	-0.053 [0.242]	-0.345 [0.137]**	-0.264 [0.127]*	-0.187 [0.234]	-0.078 [0.265]
Govt Spending - Education	-0.664 [0.250]**	-0.455 [0.240]			-0.89 [0.199]**	-0.802 [0.219]**		
Govt Spending - Health		-0.364 [0.093]**				-0.177 [0.076]*		
Govt Spending - Old Age			-2.535 [1.220]*	-3.677 [0.657]**			-0.593 [1.419]	-1.569 [1.171]
Govt Spending - Family				1.35 [2.541]				0.013 [1.882]
Constant	56.978 [22.918]**	79.021 [13.254]**	35.52 [27.462]	33.444 [16.579]*	54.727 [22.332]**	61.433 [15.261]**	25.612 [22.697]	38.277 [18.399]*
Observations	65	65	53	49	92	92	64	60
Within R <sup>2</sup>	0.885	0.924	0.895	0.899	0.751	0.762	0.662	0.638
F-stat	25.701	3.747	2.538	30.177	7.988	1.079	5.024	4.576
Prob > F	0.000	0.033	0.100	0.000	0.003	0.559	0.013	0.017
Number of clusters	7	7	7	7	7	7	7	7
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- The regressions on the attendance rates of Catholics do not include data for Denmark, Norway and Sweden.

Table 7. Determinants of church attendance in the twentieth century for Protestants.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Protestant Children</i>				<i>Dependent variable is Protestant Parents</i>			
Log GDP per capita	0.166 [1.156]	0.634 [1.012]	-0.897 [0.884]	-0.994 [1.066]	-0.557 [0.528]	-0.517 [0.580]	-1.302 [0.972]	-1.211 [1.053]
Births	-0.624 [2.174]	-0.012 [2.275]	-3.576 [3.651]	-4.91 [5.154]	1.555 [2.222]	1.884 [2.306]	-2.422 [1.779]	-2.98 [2.340]
Industries	1.087 [0.499]*	1.101 [0.456]**	0.739 [0.217]***	0.741 [0.332]*	-0.155 [0.203]	-0.119 [0.193]	-0.034 [0.149]	-0.063 [0.107]
Urban	0.021 [0.150]	0.052 [0.098]	0.074 [0.097]	0.089 [0.094]	0.049 [0.082]	0.046 [0.060]	0.018 [0.062]	0.05 [0.063]
Secondary Education	0.041 [0.028]	0.054 [0.026]*	0.048 [0.021]*	0.078 [0.049]	0.025 [0.016]	0.03 [0.014]*	0.015 [0.013]	-0.048 [0.060]
Post-secondary Education	0.064 [0.058]	0.074 [0.063]	0.032 [0.072]	0.04 [0.059]	0.053 [0.045]	0.051 [0.040]	0.004 [0.051]	0.001 [0.048]
Govt Spending - Education	-0.632 [0.162]***	-0.752 [0.230]**			-0.138 [0.162]	-0.176 [0.170]		
Govt Spending - Health		0.157 [0.133]				0.066 [0.052]		
Govt Spending - Old Age			-0.696 [1.131]	-0.362 [1.409]			-0.636 [0.641]	-0.8 [0.696]
Govt Spending - Family				-0.511 [3.051]				-1.026 [0.715]
Constant	14.361 [13.899]	11.23 [13.793]	10.02 [3.852]**	8.91 [11.415]	24.102 [7.771]**	20.905 [7.785]**	29.337 [7.018]***	35.142 [6.754]***
Observations	102	102	75	71	131	131	91	87
Within R <sup>2</sup>	0.779	0.795	0.775	0.758	0.483	0.49	0.326	0.326
F-stat	50.013	2	42.957	12.02	19.576	175.489	10.556	7.964
Prob > F	0.000	0.179	0.000	0.000	0.000	0.000	0.000	0.001
Number of clusters	9	9	9	9	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- The regressions on the attendance rates of *Protestant Children* do not include data for Ireland.

Table 8. Determinants of church attendance in the twentieth century for women.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Daughters</i>				<i>Dependent variable is Mothers</i>			
Log GDP per capita	0.405 [1.084]	0.281 [1.180]	0.48 [0.907]	0.678 [0.852]	-0.827 [0.533]	-0.813 [0.325]**	-0.166 [0.646]	0.245 [0.486]
Births	1.554 [1.644]	0.939 [1.986]	1.208 [4.957]	4.471 [5.062]	1.983 [1.458]	1.283 [1.661]	0.966 [2.419]	4.565 [3.351]
Industries	0.885 [0.350]**	0.802 [0.407]*	0.599 [0.312]*	0.535 [0.377]	0.329 [0.161]*	0.24 [0.130]*	0.14 [0.176]	0.214 [0.170]
Urban	0.168 [0.115]	0.168 [0.142]	0.33 [0.128]**	0.248 [0.075]***	0.024 [0.085]	0.027 [0.087]	0.141 [0.128]	0.098 [0.112]
Secondary Education	0.033 [0.028]	0.024 [0.036]	0.018 [0.027]	-0.059 [0.064]	0.029 [0.027]	0.018 [0.021]	0.026 [0.030]	-0.152 [0.061]**
Post-secondary Education	0.013 [0.104]	0.014 [0.101]	-0.017 [0.100]	0.008 [0.074]	0.024 [0.060]	0.023 [0.055]	0.023 [0.078]	0.021 [0.075]
Govt Spending - Education	-0.594 [0.167]***	-0.536 [0.176]**			-0.514 [0.164]**	-0.466 [0.150]**		
Govt Spending - Health		-0.108 [0.137]				-0.12 [0.063]*		
Govt Spending - Old Age			-1.964 [1.378]	-2.559 [1.367]*			-0.654 [0.920]	-1.432 [0.678]*
Govt Spending - Family				1.484 [1.425]				0.62 [0.925]
Constant	31.028 [13.477]**	35.421 [15.358]**	19.491 [12.650]	26.176 [15.408]	47.076 [7.710]***	52.004 [8.155]***	30.095 [10.503]**	37.77 [7.713]***
Observations	120	120	90	86	129	129	91	87
Within R <sup>2</sup>	0.773	0.779	0.753	0.749	0.634	0.655	0.507	0.529
F-stat	3.681	5.686	0.889	3.09	3.103	7.624	7.749	6.808
Prob > F	0.02	0.003	0.792	0.04	0.04	0.001	0.001	0.001
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

## Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.

Table 9. Determinants of church attendance in the twentieth century for men.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Sons</i>				<i>Dependent variable is Fathers</i>			
Log GDP per capita	-0.216 [0.873]	-0.272 [0.907]	-0.278 [1.608]	-0.111 [1.266]	0.269 [0.393]	0.27 [0.382]	0.211 [0.489]	0.486 [0.357]
Births	-3.347 [2.535]	-3.548 [2.661]	-3.016 [4.445]	4.09 [4.827]	0.159 [1.273]	0.025 [1.313]	-2.656 [2.941]	-0.348 [4.035]
Industries	0.831 [0.309]**	0.792 [0.364]*	0.459 [0.218]*	0.51 [0.231]*	0.418 [0.096]***	0.4 [0.090]***	0.126 [0.111]	0.151 [0.111]
Urban	0.23 [0.098]**	0.228 [0.114]*	0.335 [0.095]***	0.192 [0.099]*	0.074 [0.075]	0.074 [0.078]	0.177 [0.114]	0.148 [0.112]
Secondary Education	-0.004 [0.019]	-0.009 [0.024]	0 [0.029]	-0.051 [0.097]	0.015 [0.020]	0.012 [0.019]	0.011 [0.026]	-0.115 [0.057]*
Post-secondary Education	0.064 [0.050]	0.065 [0.054]	0.038 [0.075]	0.066 [0.087]	-0.014 [0.055]	-0.014 [0.054]	-0.022 [0.068]	-0.02 [0.059]
Govt Spending - Education	-0.943 [0.214]***	-0.911 [0.244]***			-0.462 [0.138]***	-0.453 [0.132]***		
Govt Spending - Health		-0.057 [0.124]				-0.023 [0.037]		
Govt Spending - Old Age			-1.74 [1.931]	-2.112 [1.784]			-0.36 [0.799]	-0.901 [0.711]
Govt Spending - Family				3.023 [1.565]*				0.372 [1.079]
Constant	3.46 [11.698]	7.105 [16.091]	15.587 [8.423]*	16.389 [8.081]*	14.873 [4.415]***	16.19 [5.680]**	23.552 [8.852]**	30.023 [6.279]***
Observations	122	122	89	85	128	128	91	87
Within R <sup>2</sup>	0.722	0.724	0.686	0.685	0.664	0.665	0.543	0.545
F-stat	3.984	3.676	11.507	11.721	22.437	11.625	34.201	2.888
Prob > F	0.015	0.02	0	0	0	0	0	0.052
Number of clusters	10	10	10	10	10	10	10	10
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.

Table 10. Determinants of church attendance in the twentieth century for male Catholics.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Catholic Sons</i>				<i>Dependent variable is Catholic Fathers</i>			
Log GDP per capita	2.778 [1.373]*	3.28 [1.331]*	5.308 [1.895]**	5.403 [2.071]**	0.788 [0.620]	0.796 [0.617]	0.957 [0.622]	1.586 [1.115]
Births	7.092 [3.215]*	4.223 [2.705]	3.499 [3.162]	11.965 [6.685]	0.512 [1.535]	0.485 [1.628]	-2.331 [7.544]	0.975 [10.145]
Industries	1.483 [0.471]**	0.823 [0.397]*	1.067 [0.351]**	1.032 [0.686]	1.038 [0.142]***	1.032 [0.178]***	0.677 [0.071]***	0.726 [0.172]***
Urban	-0.189 [0.588]	-0.116 [0.230]	0.5 [0.612]	0.507 [0.685]	0.091 [0.164]	0.091 [0.166]	0.284 [0.259]	0.279 [0.257]
Secondary Education	-0.029 [0.052]	-0.026 [0.043]	-0.023 [0.046]	-0.142 [0.174]	-0.032 [0.032]	-0.032 [0.032]	-0.022 [0.043]	-0.146 [0.121]
Post-secondary Education	-0.02 [0.154]	0.111 [0.191]	0.171 [0.107]	0.208 [0.242]	-0.277 [0.117]*	-0.275 [0.124]*	-0.226 [0.213]	-0.143 [0.238]
Govt Spending - Education	-0.601 [0.209]**	-0.443 [0.246]			-0.569 [0.197]**	-0.567 [0.217]**		
Govt Spending - Health		-0.416 [0.114]**				-0.005 [0.080]		
Govt Spending - Old Age			-3.243 [1.641]	-3.822 [1.279]**			-0.261 [1.331]	-0.888 [1.482]
Govt Spending - Family				2.169 [3.022]				-1.115 [2.084]
Constant	54.17 [18.779]**	78.335 [7.800]***	19.716 [22.030]	21.09 [21.844]	23.778 [8.447]**	24.034 [11.780]*	30.327 [17.454]	41.509 [17.827]*
Observations	64	64	49	45	82	82	62	58
Within R <sup>2</sup>	0.843	0.89	0.864	0.853	0.785	0.785	0.719	0.671
F-stat	8.004	3.595	2.822	41.884	2.892	2.099	4.414	8.449
Prob > F	0.004	0.043	0.081	0.000	0.07	0.163	0.02	0.002
Number of clusters	6	6	6	6	7	7	7	7
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- The regressions on the attendance rates of *Catholic Children* do not include data for Denmark, Norway, Sweden and the UK.



Table 11. Determinants of church attendance in the twentieth century for female Catholics.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Catholic Daughters</i>				<i>Dependent variable is Catholic Mothers</i>			
Log GDP per capita	0.103 [0.933]	0.182 [0.618]	0.412 [0.636]	0.917 [0.868]	-0.866 [1.212]	-0.459 [1.015]	0.446 [1.425]	1.549 [1.275]
Births	3.441 [2.513]	1.923 [1.392]	-7.879 [10.721]	-7.976 [13.111]	5.224 [2.830]	3.704 [3.105]	2.77 [7.533]	8.449 [9.205]
Industries	1.831 [0.345]***	1.443 [0.395]**	1.263 [0.400]**	1.347 [0.378]**	0.876 [0.315]**	0.624 [0.231]**	0.571 [0.142]***	0.71 [0.163]***
Urban	-0.47 [0.278]	-0.411 [0.231]	-0.153 [0.408]	-0.191 [0.376]	0.009 [0.465]	-0.001 [0.341]	0.36 [0.512]	0.348 [0.358]
Secondary Education	-0.068 [0.039]	-0.064 [0.038]	-0.082 [0.060]	-0.159 [0.110]	-0.011 [0.053]	-0.007 [0.040]	-0.003 [0.057]	-0.223 [0.112]*
Post-secondary Education	-0.572 [0.220]**	-0.475 [0.263]	-0.513 [0.359]	-0.489 [0.391]	-0.245 [0.151]	-0.148 [0.135]	-0.133 [0.230]	-0.028 [0.281]
Govt Spending - Education	-1.001 [0.280]**	-0.854 [0.350]*			-0.727 [0.194]***	-0.612 [0.189]**		
Govt Spending - Health		-0.213 [0.189]				-0.224 [0.080]**		
Govt Spending - Old Age			-2.082 [1.664]	-2.474 [1.650]			-0.655 [1.732]	-1.954 [1.317]
Govt Spending - Family				-1.744 [2.128]				0.295 [2.167]
Constant	70.446 [22.371]**	80.534 [21.672]***	40.68 [22.120]	42.25 [19.599]*	57.376 [18.012]**	69.186 [12.114]***	24.222 [27.301]	35.71 [20.202]
Observations	70	70	57	55	85	85	63	59
Within R <sup>2</sup>	0.772	0.782	0.728	0.723	0.676	0.694	0.617	0.597
F-stat	4.363	1.554	0.72	0.616	3.419	1.655	3.063	2.504
Prob > F	0.02	0.315	0.728	0.717	0.043	0.278	0.06	0.104
Number of clusters	7	7	7	7	7	7	7	7
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- The regressions on the attendance rates of *Catholics* do not include data for Denmark, Norway and Sweden.

Table 12. Determinants of church attendance in the twentieth century for male Protestants.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Protestant Sons</i>				<i>Dependent variable is Protestant Fathers</i>			
Log GDP per capita	0.145 [1.466]	0.907 [1.456]	-1.163 [1.294]	-1.277 [1.342]	-0.18 [0.334]	0.001 [0.472]	-0.443 [0.394]	-0.192 [0.445]
Births	-4.926 [2.668]	-4.059 [2.555]	-6.745 [4.664]	-8.282 [6.132]	0.159 [1.266]	0.371 [1.158]	-3.33 [2.105]	-4.939 [2.572]*
Industries	1.071 [0.567]*	1.075 [0.489]*	0.531 [0.303]	0.659 [0.407]	0.193 [0.114]	0.197 [0.110]	-0.099 [0.073]	-0.067 [0.099]
Urban	0.016 [0.147]	0.062 [0.075]	0.079 [0.101]	0.088 [0.170]	-0.019 [0.063]	-0.011 [0.058]	0.015 [0.072]	0.08 [0.060]
Secondary Education	-0.006 [0.027]	0.012 [0.019]	0.009 [0.034]	0.078 [0.078]	0.013 [0.011]	0.018 [0.012]	0.016 [0.017]	-0.057 [0.039]
Post-secondary Education	0.098 [0.075]	0.114 [0.072]	0.059 [0.094]	0.056 [0.078]	0.019 [0.026]	0.022 [0.026]	0.01 [0.041]	-0.0004 [0.040]
Govt Spending - Education	-0.785 [0.270]**	-0.958 [0.359]**			-0.296 [0.111]**	-0.345 [0.114]**		
Govt Spending - Health		0.237 [0.168]				0.059 [0.044]		
Govt Spending - Old Age			-0.76 [1.972]	-0.288 [2.213]			-0.174 [0.687]	-0.118 [0.752]
Govt Spending - Family				-0.595 [2.678]				-1.666 [0.691]**
Constant	11.009 [13.456]	6.808 [12.244]	14.122 [8.863]	7.188 [11.709]	16.447 [5.574]**	13.04 [6.200]*	25.81 [4.745]***	23.214 [4.697]***
Observations	101	101	73	69	113	113	83	79
Within R <sup>2</sup>	0.627	0.674	0.681	0.695	0.652	0.662	0.456	0.538
F-stat	3.366	2.526	3.888	179.78	16.142	13.356	8.647	25.322
Prob > F	0.034	0.09	0.02	0.000	0.000	0.000	0.001	0.000
Number of clusters	9	9	9	9	9	9	9	9
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- The regressions on the attendance rates of *Protestant Sons* and *Protestant Fathers* do not include data for Ireland.

Table 13. Determinants of church attendance in the twentieth century for female Protestants.

	OLS Fixed Effects (1)	OLS Fixed Effects (2)	OLS Fixed Effects (3)	OLS Fixed Effects (4)	OLS Fixed Effects (5)	OLS Fixed Effects (6)	OLS Fixed Effects (7)	OLS Fixed Effects (8)
	<i>Dependent variable is Protestant Daughters</i>				<i>Dependent variable is Protestant Mothers</i>			
Log GDP per capita	0.18 [0.993]	0.618 [0.899]	-0.489 [0.691]	-0.375 [0.908]	0.333 [0.641]	0.664 [0.728]	-0.334 [0.627]	-0.159 [0.712]
Births	3.013 [2.333]	3.194 [2.423]	1.463 [3.693]	-0.761 [3.178]	-0.508 [1.534]	-0.114 [1.326]	-5.244 [3.313]	-3.557 [3.400]
Industries	0.89 [0.582]	0.875 [0.535]	0.732 [0.436]	0.786 [0.516]	0.245 [0.198]	0.251 [0.193]	-0.123 [0.366]	-0.163 [0.348]
Urban	-0.018 [0.150]	0.01 [0.115]	0.018 [0.116]	0.055 [0.063]	-0.02 [0.096]	-0.006 [0.082]	0.012 [0.083]	-0.005 [0.054]
Secondary Education	0.057 [0.023]**	0.068 [0.022]**	0.056 [0.029]*	0.073 [0.051]	0.02 [0.016]	0.029 [0.014]*	0.031 [0.009]***	-0.045 [0.053]
Post-secondary Education	0.071 [0.068]	0.085 [0.074]	0.036 [0.090]	0.042 [0.075]	0.043 [0.039]	0.049 [0.041]	0.04 [0.054]	0.05 [0.059]
Govt Spending - Education	-0.42 [0.192]*	-0.529 [0.211]**			-0.472 [0.186]**	-0.57 [0.193]**		
Govt Spending - Health		0.135 [0.112]				0.109 [0.058]*		
Govt Spending - Old Age			-1.053 [1.132]	-0.415 [1.075]			-0.313 [0.560]	-0.568 [0.783]
Govt Spending - Family				-0.701 [2.436]				0.454 [0.809]
Constant	-4.192 [20.255]	-12.26 [19.978]	17.76 [12.394]	14.534 [19.225]	40.617 [6.970]***	13.721 [8.175]	31.714 [10.130]**	36.498 [10.601]***
Observations	100	100	74	71	111	111	80	76
Within R <sup>2</sup>	0.749	0.759	0.708	0.695	0.636	0.657	0.476	0.467
F-stat	4.586	6.902	14.334	69.881	29.668	87.013	17.363	2.561
Prob > F	0.011	0.002	0.000	0.000	0.000	0.000	0.000	0.086
Number of clusters	9	9	9	9	9	9	9	9
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

- OLS regressions with time-fixed effects and robust standard errors clustered by countries. Robust standard errors are given in brackets.
- \* indicates significance at the 10%-level; \*\* indicates significance at the 5%-level; \*\*\* indicates significance at the 1%-level.
- The regressions on the attendance rates of *Protestant Daughters* and *Protestant Mothers* do not include data for Ireland.

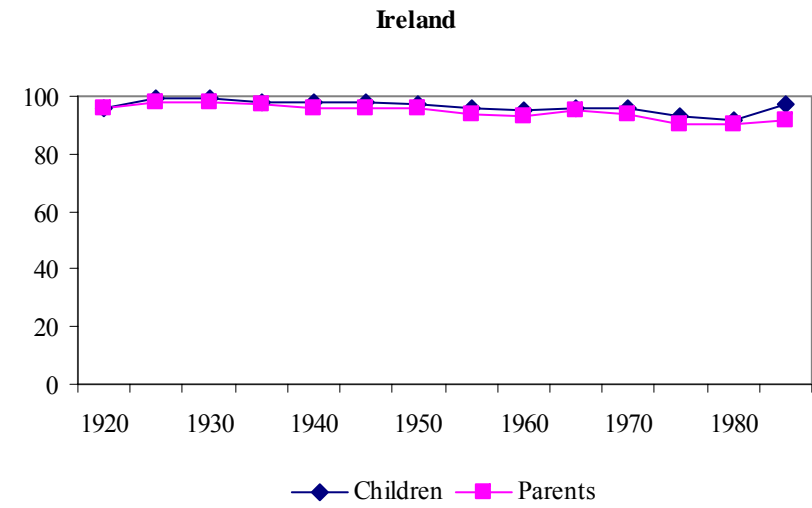
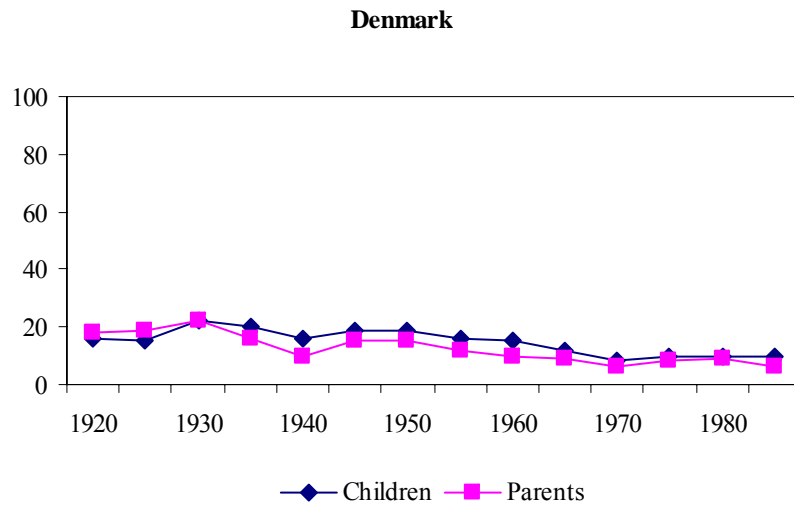
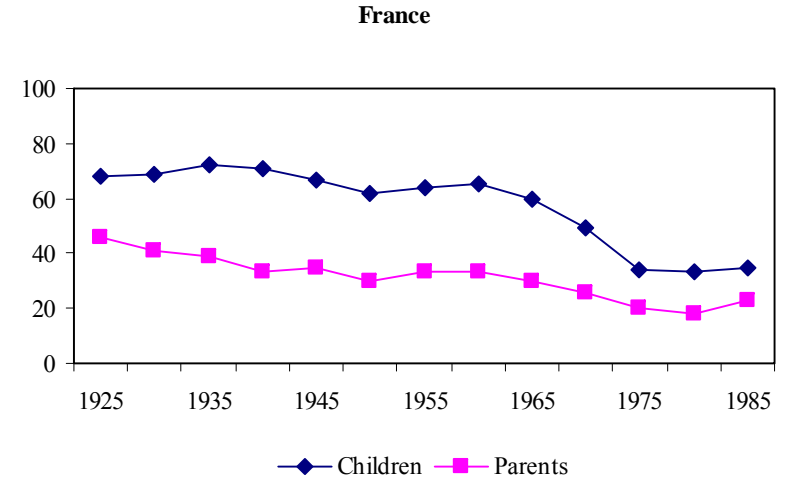
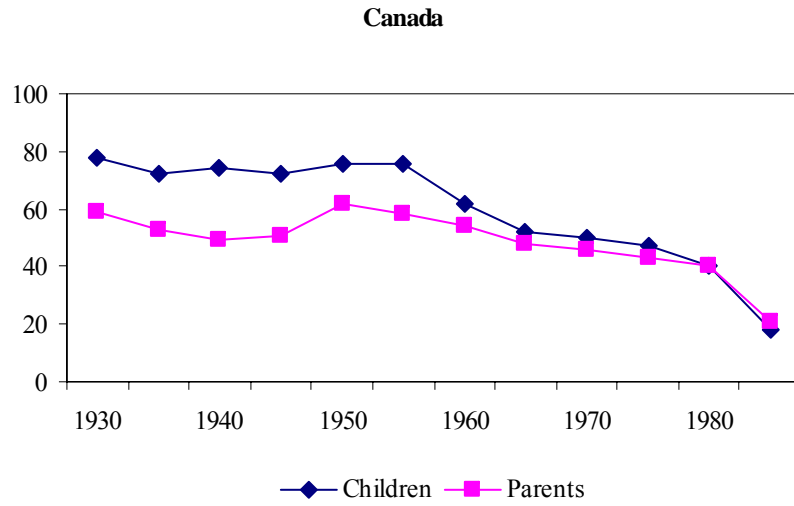
Table A1. List of variables.

Variables	Definition
<i>Dependent variables</i>	
Children	Church attendance rate of the survey respondents
Parents	Church attendance rate of the survey respondents' parents
Catholic Children	Church attendance rate of the Catholic survey respondents
Catholic Parents	Church attendance rate of the survey respondents' Catholic parents
Protestant Children	Church attendance rate of the Protestant survey respondents
Protestant Parents	Church attendance rate of the survey respondents' Catholic parents
Sons	Church attendance rate of the male survey respondents
Daughters	Church attendance rate of the female survey respondents
Fathers	Church attendance rate of the survey respondents' fathers
Mothers	Church attendance rate of the survey respondents' mothers
Catholic Sons	Church attendance rate of the Catholic male survey respondents
Catholic Fathers	Church attendance rate of the survey respondents' Catholic fathers
Protestant Sons	Church attendance rate of the Protestant male survey respondents
Protestant Fathers	Church attendance rate of the survey respondents' Protestant fathers
Catholic Daughters	Church attendance rate of the Catholic female survey respondents
Catholic Mothers	Church attendance rate of the survey respondents' Catholic mothers
Protestant Daughters	Church attendance rate of the Protestant female survey respondents
Protestant Mothers	Church attendance rate of the survey respondents' Protestant mothers
<i>Explanatory variables</i>	
Log GDP per capita	Logarithm of the Gross Domestic Product per capita
Births	Ratio of births per women in the population
Industries	Share of the population working in the industrial sector
Urban	Share of the population living in urban areas (in 1,000,000)
Secondary Education	Share of individuals in the population attending high school
Post-secondary Education	Share of individuals in the population in universities and equivalent post-secondary institutions
Govt Spending - Education	Share of education-related expenditures in the country's total public expenditures
Govt Spending - Health	Share of health-related expenditures in the country's total public expenditures
Govt Spending - Family	Share of family-related expenditures in the country's GDP
Govt Spending - Old Age	Share of old age-related expenditures in the country's GDP
<i>Instrumental variables</i>	
Interest rate	Interest rate on the government's long-term bonds
Exchange rate	Exchange rate between the country's currency and the US dollar
Net Immigration	Difference between the number of immigrants and emigrants
Strike	Days of work lost per worker as a result of strikes
Tariff	Import duties over exports
Unemployment	Logarithm of the unemployment rate

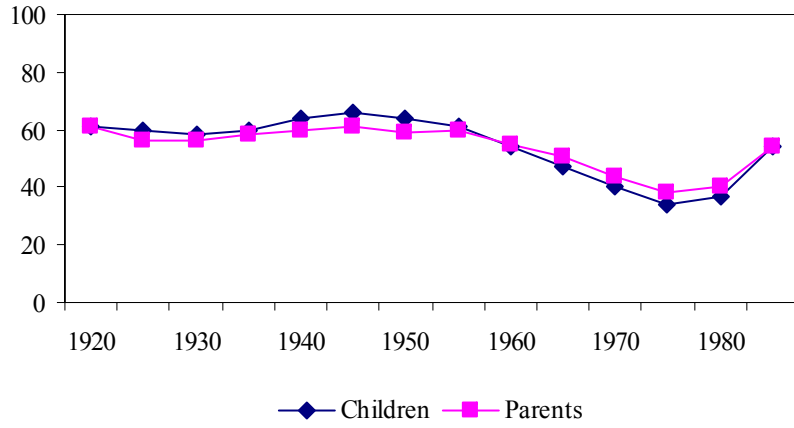
Table A2. Descriptive statistics

	Observations	Mean	Std. Dev.	Minimum	Maximum
<i>Dependent variables</i>					
Children	134	49.19	26.84	8.00	99.00
Parents	134	39.23	25.36	6.00	98.00
Catholic Children	65	77.28	15.86	45.10	100.00
Catholic Parents	93	64.30	20.22	18.95	99.01
Protestant Children	102	34.78	20.25	5.00	75.30
Protestant Parents	132	29.21	19.43	3.85	93.00
Sons	122	45.49	26.74	6.78	98.66
Daughters	120	51.19	27.03	8.36	99.53
Fathers	129	35.94	25.46	5.44	98.09
Mothers	130	43.14	25.85	6.19	98.99
Catholic Sons	64	76.66	15.85	38.58	100.00
Catholic Fathers	82	60.36	22.80	18.48	98.90
Protestant Sons	101	30.74	19.48	4.25	72.65
Protestant Fathers	114	22.22	13.57	2.97	50.88
Catholic Daughters	70	78.13	18.58	6.71	100.00
Catholic Mothers	85	67.63	19.62	19.55	99.26
Protestant Daughters	100	37.28	20.92	5.63	80.38
Protestant Mothers	112	29.13	17.50	0.90	66.81
<i>Explanatory variables</i>					
Log GDP per capita	140	1.04	1.83	-2.18	5.16
Births	140	0.59	1.00	0.04	4.35
Industries	140	35.51	7.45	14.50	50.40
Urban	140	59.26	17.33	27.50	88.80
Secondary Education	140	51.76	56.76	0.19	265.81
Post-secondary Education	140	11.78	15.23	0.92	93.42
Govt Spending - Education	137	10.67	6.99	0.00	27.00
Govt Spending - Health	137	22.93	14.62	0.65	60.34
Govt Spending - Family	88	1.47	1.08	0.00	4.46
Govt Spending - Old Age	92	4.07	2.63	0.00	9.25
<i>Instrumental variables</i>					
Interest rate	140	6.34	3.5	2.51	19.88
Exchange rate	139	2.97	2.46	0.02	10.60
Net Immigration	95	27903.21	92370.05	-280000	334000
Strike	139	3776527	9085877	163	66400000
Tariff	117	0.07	0.06	0.008	0.382
Unemployment	133	1.36	1.16	-2.3	3.46

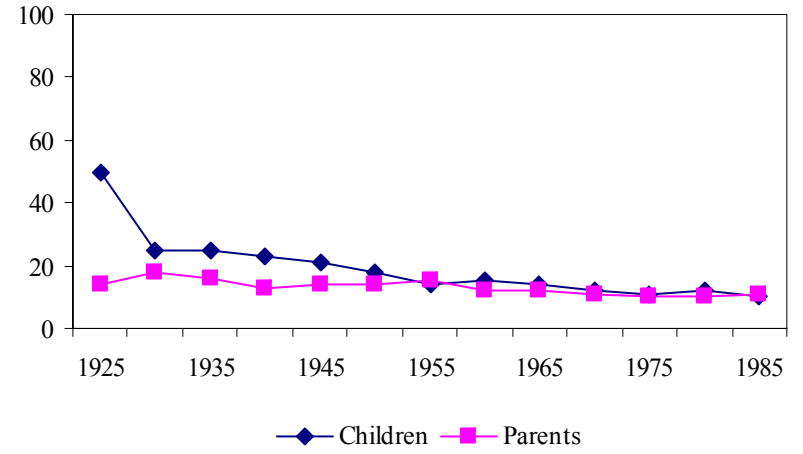
Figure 1. Church attendance, 1920-1990



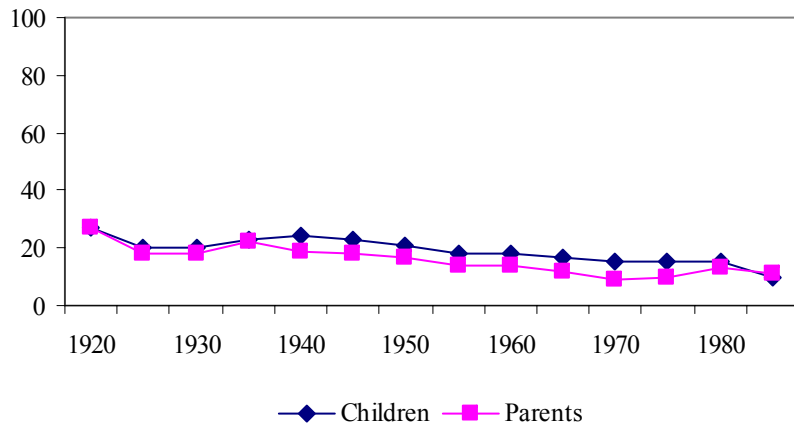
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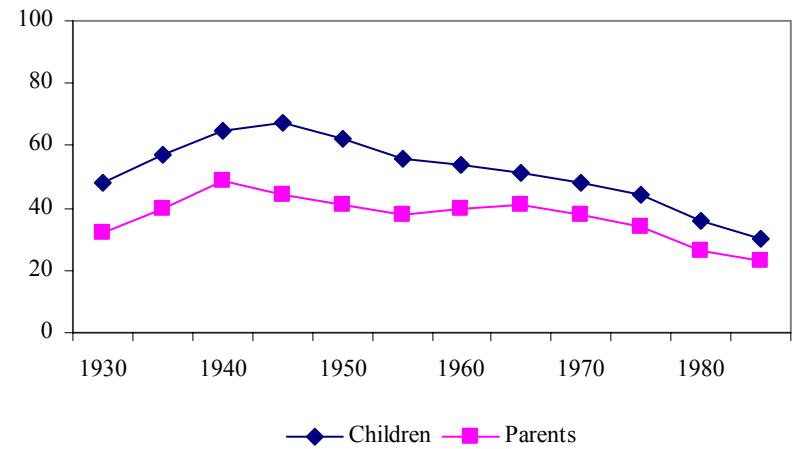
Sweden



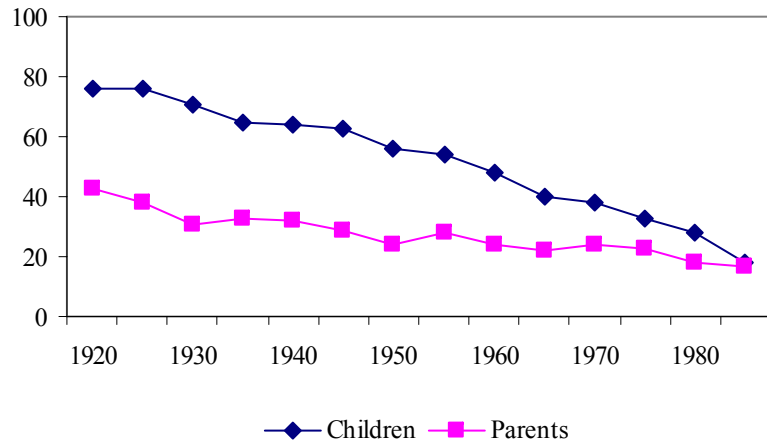
Norway



Switzerland



United Kingdom



USA

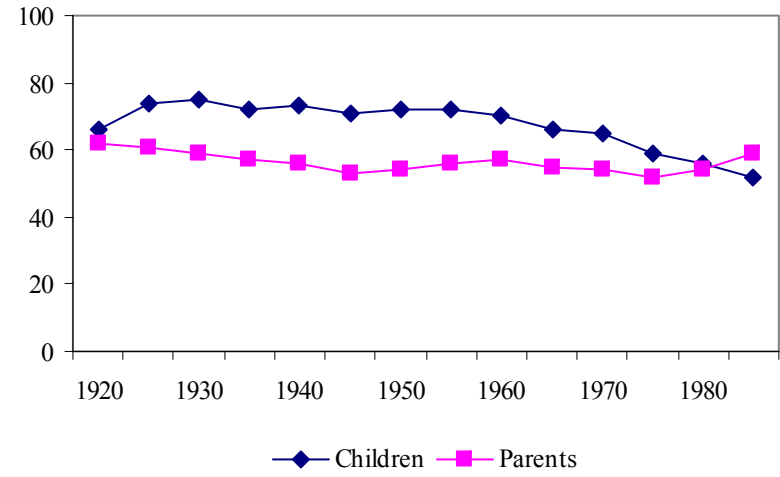
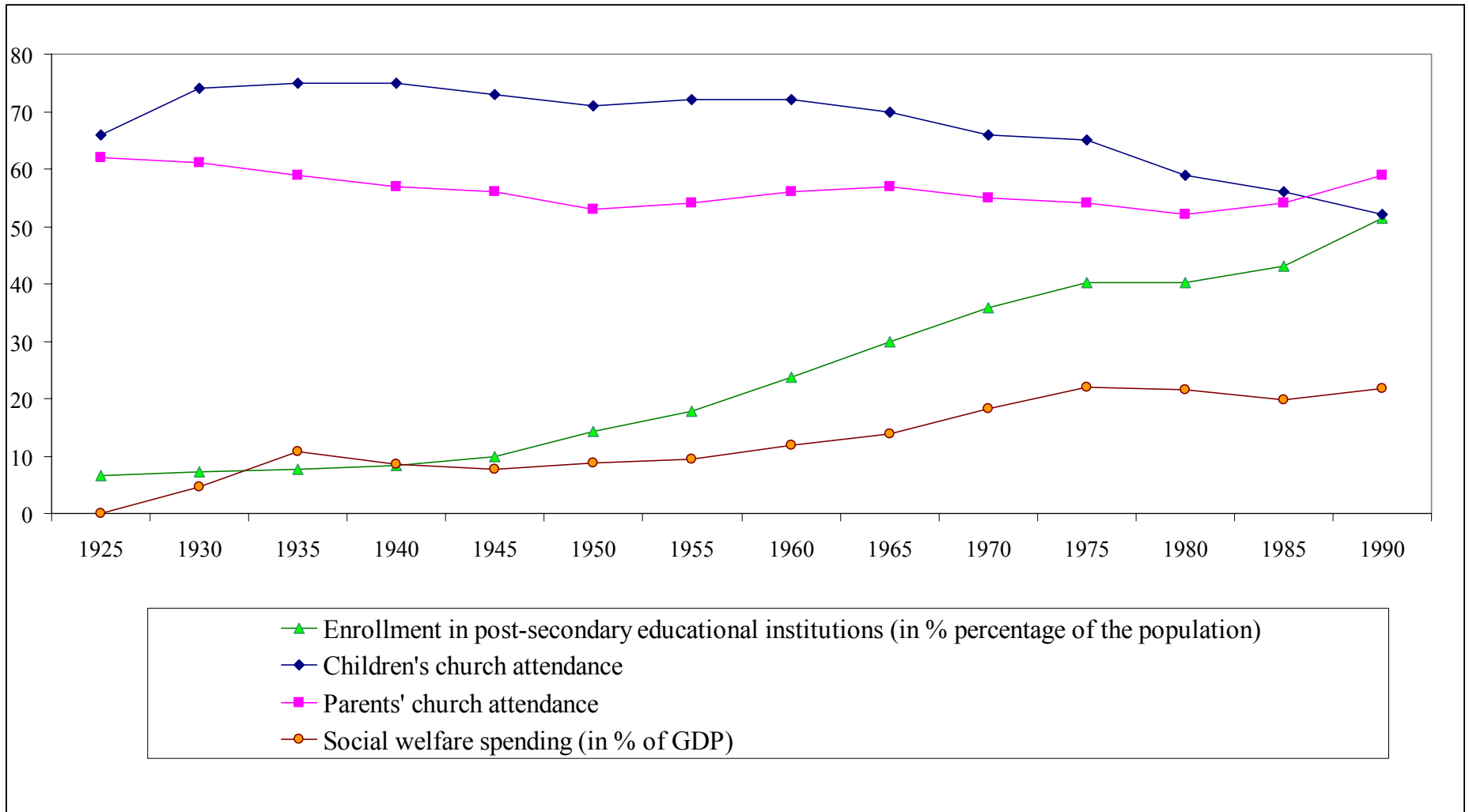


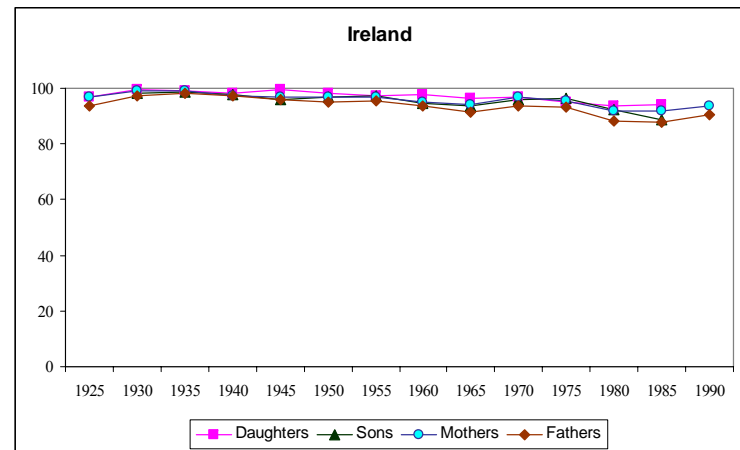
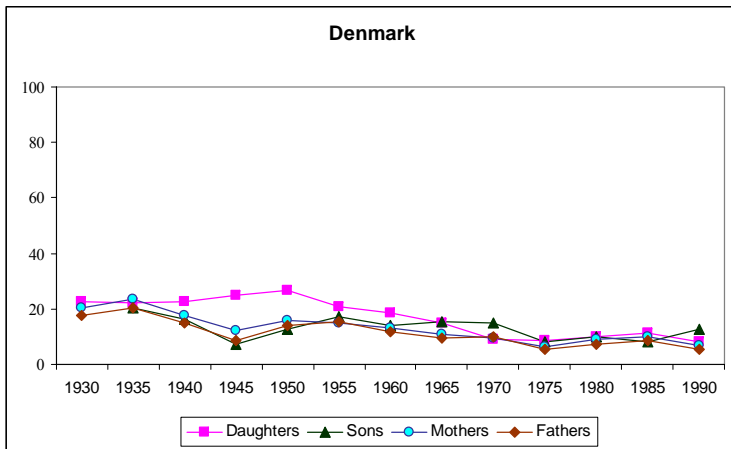
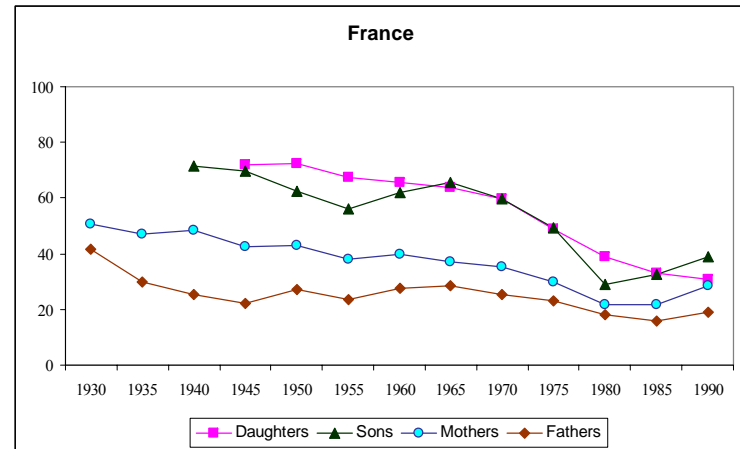
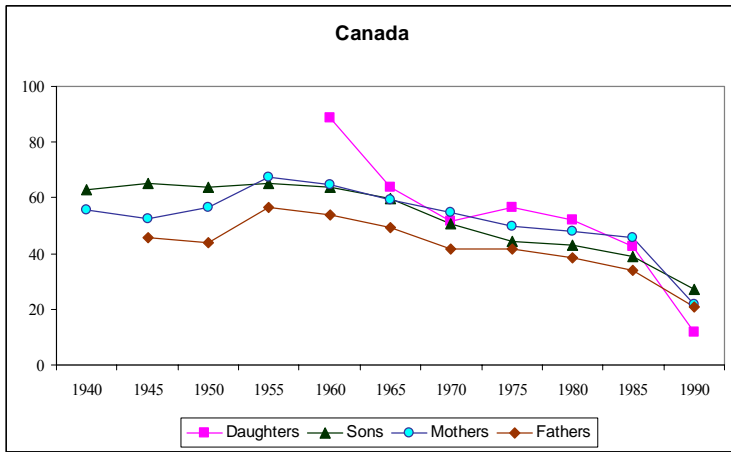


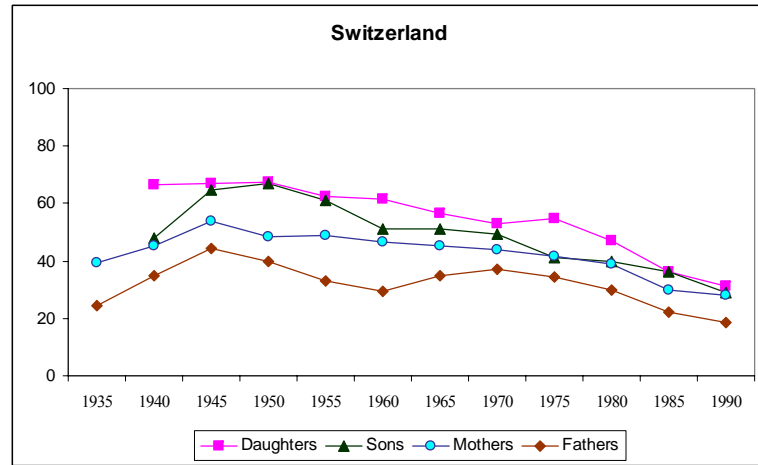
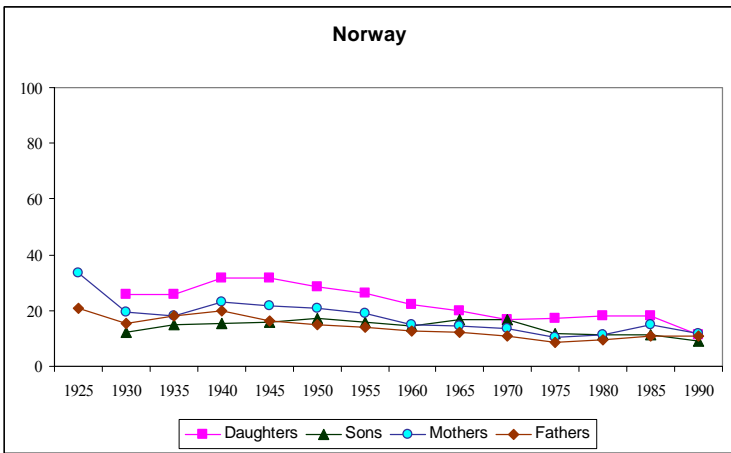
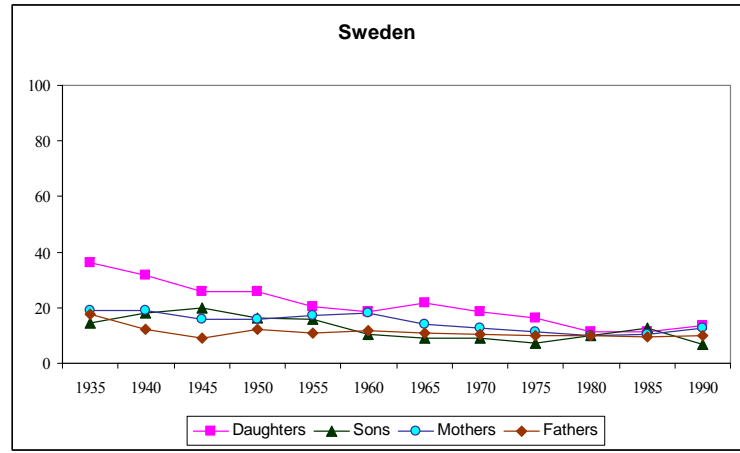
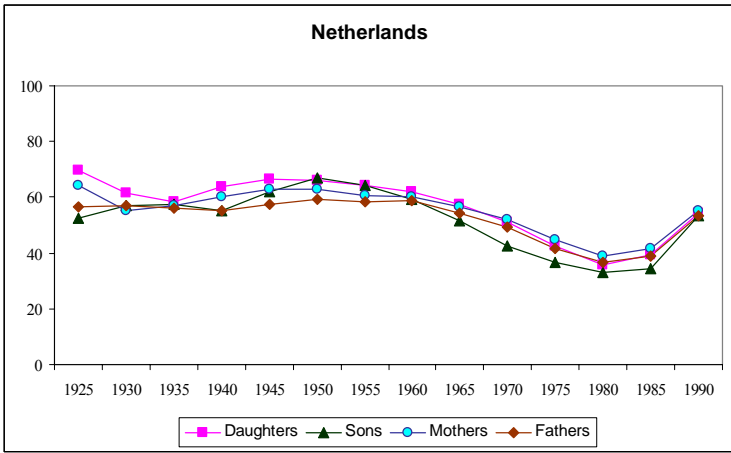
Figure 2. Church attendance, enrollment in post-secondary institutions and social welfare spending in the United States, 1925-1990.



Note: The data on post-secondary institutions enrollment are from Goldin (2006, Series Bc524), while social welfare spending in share of the GDP is computed from Fishback and Thomasson (2006, Series Bf188) and Sutch (2006, Series Ca10). The attendance of children and parents computed by the authors from the ISSP surveys as discussed in Appendix 1.

Figure 3. Church attendance of men and women, 1920-1990





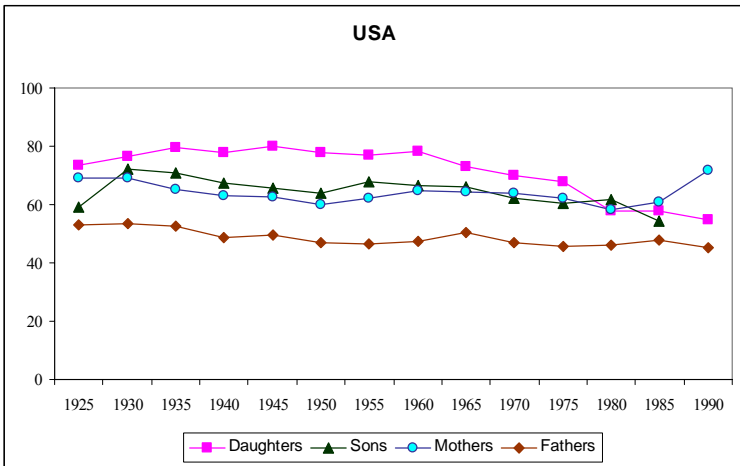
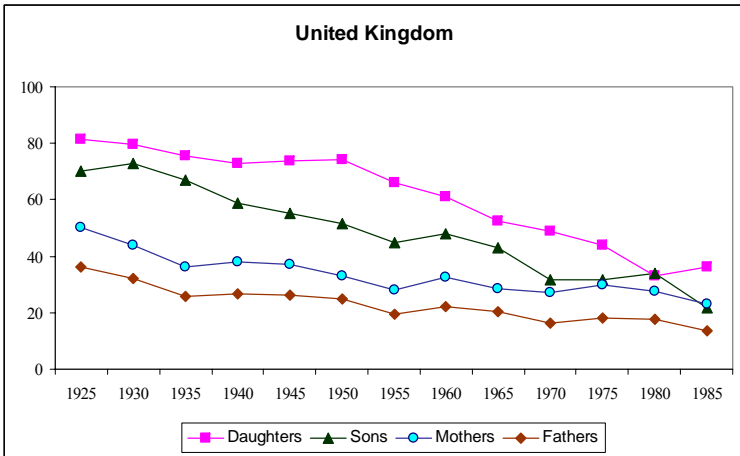


Figure 4. Church attendance of Catholics and Protestants, 1920-1990

