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 depresses 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 validate the religion-market model by showing that the growth of the welfare state significantly diminished religiosity. Such findings therefore suggest that people were historically observant because churches offered welfare services which were not provided by the State.

Keywords: Church Attendance, Economic Growth, Religiosity, Secularization, Welfare State.

JEL Classification: H53, N32, N34, Z12.

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1. Introduction

Contemporary debates over religiosity almost always focus on church attendance, even where the trends (or the data) scarcely exist. [1] 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."[2] 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". In other words,

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[1] Throughout this article, the term "church attendance" is used in place of the awkward, but more accurate, phrase "religious service attendance."

[2] 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") that 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") that 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, such as the establishment of state-religion or the development of a welfare state, should have a significant impact on religiosity.

However, following Weber (1905), proponents of the secularization hypothesis such as Chaves (1994) and Bruce (2001) argue that religious participation is "demand-driven". They consider that economic development, which includes industrialization, an increase 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 (2006) find in a study of religiosity in 68 countries 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 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 depresses 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, this study relies on a large, international database on religious activity spanning many decades based on the recent polls conducted by the International Social Survey Program (ISSP). As discussed in detail by Iannaccone (200X), this dataset allows us to reconstruct long-run church attendance trends in the United States, Canada and most of Western Europe. They do so thanks to a novel set of *retrospective* questions concerning the religious participation of

the respondents and 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 the 1920s through the 1990s – a longer and more detailed series of observations than we have ever had for any nation.

The results suggest that the factors which are associated with the secularization hypothesis, e.g., higher wealth, 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 provide cheap education and health services; afterwards, those individuals for whom personal religion did not have any meaning stop attending services because the welfare state had allowed them to obtain these services from governmental agencies.

The remainder of this article is as follows. Section 2 presents the data. Section 3 discusses the empirical methodology and Section 4 analyzes the results. Section 5 concludes.

2. Data

In this section, we first present the ISSP data on church attendance in the twentieth century. These data suggest that church attendance has decreased in Western European countries, as well as in the USA and in Canada. This decline was particularly sharp in the 1960s, a decade which both saw a quick rise in GDP and the development of the welfare state.

We then review our explanatory variables in light of the secularization hypothesis and of the religion-market model, as well our instrumental variables. 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 thirty different countries between the 1920s and the 1990s, including the 10 countries which constitute the focus of this study: Canada, Denmark, France, Ireland, 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.[3] As such, they did not undertake policies to encourage or discourage church attendance, unlike some twentieth-century dictatorships.[4] In addition, it must be noted that we only analyze church participation in

[3] 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, Netherlands, 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 extensively 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, for the sake of the argument, 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.

[4] Twentieth-century dictatorships like Fascist Italy, Nazi Germany and Communist Russia all discouraged church attendance. The long-term effect of these anti-religious policies is unknown and it is best not to

countries which have historically been Christian, i.e., Roman Catholic and Protestant, and excludes the respondents who identified themselves with a non-Christian religion, e.g., Judaism, Islam. While few, if any, non-Christian countries were democracies during 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, notably Judaism, service attendance may be less central to religious identity.

The retrospective approach in the 1991 and 1998 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 1920s through the 1990s.

Before turning to the problems that may afflict retrospective data in general and the ISSP data in particular, it helps to examine the estimates for several different

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include these countries in our study. On the views of German Nazis and Italian Fascists vis-à-vis Christian churches, see among Nolte (1963). See also Ostenc (1980) on the clashes between Fascism and the Catholic Church on educational matters in Italy. See Conquest (1968) on religion in the USSR.

countries. Table 1 summarizes estimated church attendance rates for parents and children in each ISSP country and each 5-year interval between 1925 and 1990. Figure 1 plots attendance rates for the 10 countries in our sample.[5]

[Table 1 here]

[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 Gallup polls of the 1940's, U.S. surveys have consistently found attendance rates around 40% per week (Finke 1992; Greeley 1989). Repeated polls likewise 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).[6]

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[5] The attendance estimates in tables 1 are "midpoint" predictions derived from a series of overlapping regressions. For example, to obtain the 1960 rate for the U.S. in table 1, I regress parental attendance on to parent gender and parent year for all U.S. observations corresponding to 1960 plus or minus four parent years. ("Parent year" refers to the year to which the retrospective observation should apply.) The regression provides the mid-point estimate listed in table 1 as well as confidence intervals and other relevant statistics). Appendix 2 of Iannaccone (200X) describes the data and estimation methods in more detail, while also reviewing several other methods, which (fortunately) yield similar results.

[6] The U.S. is blessed with three independent sets of annual (semi-annual) surveys that 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.

Figure 1 captures the stable patterns described above while also extending them to decades that predate the earliest available surveys. 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. Because standard surveys only include adults, researchers have previously had little to say about attendance among children.[7]

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 see in Figure 1, coupled with a far more dramatic decline in childhood rates of participation. In the Netherlands, 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

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[7] 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 Table 1 confirm that 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 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 my analysis of data from the 1976 – 1992 "Monitoring the Future" surveys of American High School seniors (Bachman 1997).

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.[8]

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 England), and examples of 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 in table 1 vary too much to be artifacts of a simple bias; they mirror documented trends in the USA and Britain (and partially-documented trends in Scandinavia, Ireland, and most other Western nations).

Still, 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 (200X), 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

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[8] Catholics constitute a little less than half of the Dutch population. For 5-year intervals running from 1930 through 1985, Iannaccone (200X) 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 (200X).

than today, survey respondents may be inclined to apply this image to their own past. The *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-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. Indeed, when the primary goal is to generate a profile of aggregate *trends and turning points* (as opposed to accurate estimates of some underlying *level*), retrospective methods will often yield extremely robust results, regardless of the sampling method or question content.[9]

In addition, Iannaccone (200X) 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 data's value.

2.2. Explanatory variables

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[9] To see why, let R_t represent the (attendance) estimate for period t generated via retrospective responses to a survey administered at time $M > t$. By definition, R_t is derived from respondents of a single age (or age group), A_t. Hence, the estimated change ΔR or correlation ρ_R across any two periods will be (largely) unaffected factors that exert (nearly) uniform biases across all age groups in the sample. (The major effect will be to shift *overall* levels up or down, while not changing relationships across time periods or between R and its demographic correlates, such as race, region, religion, gender, and marital status.) Extending this result to multiple samples, we see that, despite probable shifts in overall levels, the estimated trends and turning points in retrospective time series will tend to remain consistent despite shifting samples, questions, or survey methods.

Several sources were used to collect our explanatory variables: Carter et al. (2006), Flora (1983), 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 Urbanization and industrialization

If the secularization hypothesis is correct, so that economic development decreases religiosity, then areas where a large share of the population works in the industry, rather than in the agricultural sector, should become more secular. And since industries are usually located in urban areas, we should also find that countries with a high urbanization rate are 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.[10] This would increase church attendance.

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.

2.2.2. Income

[10] 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.

The secularization hypothesis suggests that religious observance is negatively correlated with higher income. Therefore we expect the rise in Gross Domestic Product (GDP) per capita to entail a decrease in religiosity.

The religion-market model would however suggest that the growth in GDP per capita would have no effect on church attendance. 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.

2.2.3. Human capital

The secularization hypothesis and the religion-market model suggest 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, would decrease 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 less 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. It points out to studies by McCleary and Barro (2006) which notably shows that church attendance increases with education.

To test these competing hypotheses, we collected data on fertility and education in the countries that make up our sample. Our measure of fertility, denoted *Births*, is the

number of births per women in each country throughout the period. If the secularization hypothesis is correct, the decrease in fertility should have entailed a decline in church attendance.

In addition, our measure of education is the number of individuals who attend each universities or equivalent post-secondary learning institutions, which we denote *Tertiary_education*.[11] If the secularization hypothesis is correct, the rise in the number of college and university students that occurred during the twentieth century should explain the decline in religiosity.

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 occurred during the twentieth century is the major cause of the decline in religiosity. It allowed individuals to become secular since they could obtain from the welfare state the health-, old-age and education-related services, which they previously received from the churches. The religion-market model therefore predicts a negative relationship between religiosity and the different measures of public spending associated with the welfare state in our sample (the *Education, Family, Health* and *Old Age* variables).

2.3. Instrumental variables

[11] We focus on college and university graduates because this is the group of individuals whose size significantly increased during the twentieth century. Indeed, it would not be relevant to use data on primary or secondary schooling had become mandatory in most of the countries in our sample by the end of the nineteenth century.

As we explain in detail below in Section 3, we rely on instrumental variable to assess the robustness of our regressions. As is well-known, such instrumental variables can only be used if they are not correlated with the dependent variable, but only with the explanatory variables. In particular, in this article, we follow McCleary and Barro (2006, p.164)'s argument and believe this concern is mainly valid for the *GDP per capita* variable.

Thus we employ the *Defense* variable, which computes the share of defense-, justice- and police-related expenditures in the country's total expenditures. It does not seem that this variable is correlated with church attendance. Rather, it depends on internal and external political events: if countries fight fewer wars and/or wars of lower intensity, they would reduce public spending on the defense sector, and maybe redirect the funds to other public programs. For instance, our data show that the defense-, judiciary- and police-related expenditures in France represented 27.8% of the total public expenditures of the government in 1925, and increased to 40.7% just before World War II. This share had already decreased to 27.9% in 1960, when France was fighting a lower-scale conflict than WW2, namely, the Algerian war of Independence. In 1990, when France was not taking part in any conflict, so that its army mostly dealt with peace-keeping missions in various parts of Africa and Europe, defense-, judiciary- and police-related expenditures only represented 17.5% of the total public expenditures of the government.

Our other instrumental variable is *Strike*, which assesses the days of work lost per worker as a result of strike. Strikes obviously have a negative effect on GDP but they do not seem to be correlated with religiosity. Indeed, while the academic literature on strikes, e.g., Kennan, 1987, Cramton and Tracy, 1992, Cramton et al. 1999, singles out

several macroeconomic and microeconomic factors to explain why workers decide to stop working but not church attendance. It is indeed unclear why high or low religiosity would make workers more or less prone to striking, as they usually strike for mundane causes, such as higher wages and better work conditions.

3. Methodology

To find the determinants of the decline in religiosity in 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 measure the church attendance of children and parents in country c in year t as computed from the ISSP survey, X is a vector of explanatory variables and ε is an error term such that $\varepsilon \to N(0,\sigma^2)$. 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 the country- and year-fixed effects α_c and α_t in Equations (1) and (2).

The specification in Equations (1) and (2) suggests that a change in economic circumstances has an immediate effect on church attendance. However, it seems more likely that changes in religiosity may occur slowly. For instance, a sudden governmental increase in welfare spending may not have an impact of the religiosity of old parishioners who already benefit from the social services of the Church. It may however have an effect on the level of church attendance of young individuals who could rely on the State to finance their future stay in old-age homes.

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

$$Children_{c,t} = \alpha_c + \alpha_t + \beta X_{c,t} + \gamma Children_{c,t-1} + \varepsilon_{c,t} \quad (3)$$

and

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

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

While Equations (3) and (4) cannot be estimated with a pooled OLS estimator (see Greene, 2008), the fixed effects OLS estimator can be consistent provided that in Equation (3),

$$\text{Cov}(Children_{c,t-1}, \varepsilon_{c,t}) = \text{Cov}(X_{c,t}, \varepsilon_{c,t}) = 0 \text{ as } T \to \infty \quad (5)$$

and that in Equation (4),

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

Furthermore, the fixed effects OLS estimator can be shown to become consistent when the number of time periods in the sample increases, i.e., as $T \to \infty$ (Wooldridge, 2002).

But beyond the econometric concerns, it is possible that the fixed effects OLS estimator is not appropriate, i.e., that $\text{Cov}(Children_{c,t-1}, \varepsilon_{c,t}) \neq 0$ or $\text{Cov}(Parents_{c,t-1}, \varepsilon_{c,t}) \neq 0$, because of a reverse causality issue. This is particularly likely to bias the results, especially when the regressions include the *GDP per capita* variable as noted by McCleary and Barro (2006). Indeed, our study posits that GDP per capita affects religiosity, but we cannot rule out that there is a causal relationship from religiosity to GDP per capita. To solve for this potential endogeneity bias in our regressions, we rely

on the *Defense* and *Strike* instrumental variables to estimate Equations (3) and (4) following Anderson and Hsiao (1982)'s 2SLS approach.[12]

4. Results

This section analyzes the results of our regressions. Tables 2 and 3 present OLS regressions with fixed effects that are used to estimate Equations (1) and (2), i.e., to estimate the determinants of religiosity in democratic countries during the twentieth century. In Tables 4 and 5, we use the 2SLS method to estimate to Equations (3) and (4) where we employ *Defense* and *Strike* to instrument for the possible endogenous relationship between religiosity and GDP per capita.

Each column in all the Tables displays the same specification. Columns (1) to (4) focus on the effects of health and education on religiosity while Columns (4) to (8) show the effects of old-age family-related expenditures, such as child benefits, on church attendance. We also include in Columns (1), (3), (5) and (7) the *Births* variable. All the regressions include the *GDP per capita*, *Tertiary_Education, Urban* and *Industries* variables.

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

4.1 Wealth and human capital

[12] Anderson and Hsiao (1982)'s method provides consistent estimates, but it must be acknowledged that it does always provide an efficient estimation (see Wooldridge, 2002). Unfortunately, we cannot rely on the Arellano-Bond (1991) GMM estimator in this study because it was designed to handle samples that have a limited number of temporal observations on a large number of countries ("small T, large N"). Unfortunately, there were not many countries which were democracies throughout the twentieth century and for which there are retrospective data on church attendance. These constraints sharply reduce the number of observations our sample, and make it impossible for us to use the Arellano-Bond (1991) estimator.

In our regressions, we find that the *GDP per capita* variable does not have any effect on the change in religiosity, or even has a positive impact, depending on the specification. Such a finding obviously constitutes a major invalidation of secularization theories.

This result also suggests that McCleary and Barro (2006)'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 quite secular, but there is no reason to believe that they became less observant as their income grew during the 1925-1990 period. 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. It ultimately led to the separation between Church and State in France in 1905.[13]

Secularization theories also suggest that higher education levels would lead to less church participation. But McCleary and Barro (2006) had already remarked that higher levels of education could be associated higher religiosity. Some of our regressions actually corroborate McCleary and Barro (2006)'s result, as we find that the

[13] On the dechristianization of France, see among others Badone (1989), Ford (1993), Franck (2009) and Weber (1976).

Tertiary_education variable has a positive coefficient in several, but not in all the regressions. The results are therefore not robust enough for us to suggest that they invalidate another claim of the secularization hypothesis.

Actually, only one result in our regressions is in line with the claims of the secularization hypothesis on the link between high human capital and religiosity: we find that the *Births* variable has a significant and positive coefficient in several regressions, thus suggesting that a decrease in fertility entails a decline in religious participation. However, this result is not robust in all our specifications. Furthermore, it does not really invalidate the religion-market model. This is because proponents of the religion-market model would suggest that individuals with a limited number of children, or even without 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 urbanization and industrialization have reduced religiosity. However, the *Urban* variable is not significant in the OLS regressions of both Tables 2 and 3. It nonetheless has a significant and a negative coefficient in some of the 2SLS regressions in Tables 4 and 5.

Furthermore, the *Industrialization* variable has a positive and significant coefficient in all the regressions in Table 2 and in most of those in Table 3. However, our robustness checks in Tables 4 and 5 fail to confirm these results: in most of the regressions, the *Industrialization* is insignificant, and is even negative in a few instances.

Hence, these observations fail to confirm the conjecture of the secularization theories, which contend that urbanization and industrialization have a negative effect on

religiosity. At the same time, they do not fully vindicate the claims of the religion-market model, which suggests that these factors may enhance 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

While the results in Tables 2 and 3 suggest that church attendance was not influenced by health- or family-related public expenditures, they show that the growth in public spending on education and the growth in old-age expenditures led to a decline in religiosity. These observations are confirmed in the robustness checks carried out in Table 4 and in nearly all the regressions in Table 5.

These results vindicate the claims of the religion-market model, which consider that religious participation is supply-driven. It thus explains the decline in church attendance by the crowding effect of public spending on charitable activities of the Protestant and Catholic churches.

However, it would be wrong to interpret our results as suggesting that religious participation is never demand-driven. Instead, they suggest that in the countries which were democracies during the twentieth century, and where religious participation was neither encouraged nor discouraged, the demand for religious participation has been stable. What changed in these 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 valuable. It changed the supply conditions of religious activities and triggered the secularization process that took place in the Western

World during the 1960s, as individuals who look to churches for social services were henceforth able to obtain them from governmental agencies.

5. Conclusion

This article provides a test of the secularization hypothesis and of the religion-market model by exploiting the retrospective questions in the 1991 and 1998 ISSP surveys which yield detailed estimates of religious trends across dozens of countries. They 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 during the twentieth century.

Our results provide scant evidence for the secularization hypothesis. They invalidate the claims that the increase in GDP per capita which occurred in Western European countries in the USA and Canada would a negative effect on religiosity. In addition, they fail to find any systematic effect of industrialization and urbanization on church attendance.

Conversely, our results indicate that the development of the welfare state significantly depressed religiosity. Such findings clearly vindicate the religion market model hypothesis, which argues that there is a "supply-side" to religious participation: many individuals have historically been observant because churches funded welfare services which the State did not provide.

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 regions of the world, notably the Muslim countries 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.

Second, while our findings show that the growth of the welfare state explains the decline in church participation during the twentieth century, they do not explain why some individuals, notably those who are educated and belong to the middle-class, have nonetheless remained observant. Such an aspect of human behavior is also clearly left unanswered by the secularization hypothesis. This issue could thus be a topic for future research.

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Table 1. Estimated attendance rates, 1925-1990

		1925	1930	1935	1940	1945	1950	1955	1960	1965	1970	1975	1980	1985	1990
Canada	**children**	--	--	78	72	74	72	76	76	62	52	50	47	40	18
	parents	--	--	59	53	49	51	62	58	54	48	46	43	40	21
Denmark	**children**	16	15	22	20	16	19	19	16	15	12	8	10	10	10
	parents	18	19	22	16	10	15	15	12	10	9	6	8	9	6
France	**children**	--	68	69	72	71	67	62	64	65	60	49	34	33	35
	parents	--	46	41	39	33	35	30	33	33	30	26	20	18	23
Great Britain	**children**	76	76	71	65	64	63	56	54	48	40	38	33	28	18
	parents	43	38	31	33	32	29	24	28	24	22	24	23	18	17
Ireland	**children**	96	99	99	98	98	98	97	96	95	96	96	93	92	97
	parents	96	98	98	97	96	96	96	94	93	95	94	90	90	92
Netherlands	**children**	61	60	58	60	64	66	64	61	54	47	40	34	37	54
	parents	61	56	56	58	60	61	59	60	55	51	44	38	40	54
Norway	**children**	27	20	20	23	24	23	21	18	18	17	15	15	15	10
	parents	27	18	18	22	19	18	17	14	14	12	9	10	13	11
Sweden	**children**	--	50	25	25	23	21	18	14	15	14	12	11	12	10
	parents	--	14	18	16	13	14	14	15	12	12	11	10	10	11
Switzerland	**children**	--	--	48	57	65	67	62	56	54	51	48	44	36	30
	parents	--	--	32	40	49	44	41	38	40	41	38	34	26	23
United States	**children**	66	74	75	72	73	71	72	72	70	66	65	59	56	52
	parents	62	61	59	57	56	53	54	56	57	55	54	52	54	59

Table 2. The religiosity of children, 1920-1990: OLS regressions.

	(1) Children	(2) Children	(3) Children	(4) Children	(5) Children	(6) Children	(7) Children	(8) Children
GDP per capita	0.049	0.047	0.05	0.048	0.095	0.089	0.07	0.065
	[0.049]	[0.052]	[0.049]	[0.052]	[0.034]**	[0.032]**	[0.040]	[0.039]
Industries	0.921	0.973	0.829	0.875	0.731	0.739	0.636	0.639
	[0.274]***	[0.283]***	[0.297]**	[0.331]**	[0.263]**	[0.282]**	[0.288]*	[0.315]*
Tertiary_education	0.463	0.146	0.466	0.158	0.474	0.304	0.408	0.229
	[0.378]	[0.255]	[0.362]	[0.248]	[0.361]	[0.325]	[0.357]	[0.345]
Urban	-0.689	-0.202	-0.690	-0.218	-0.596	-0.390	-0.517	-0.300
	[0.529]	[0.324]	[0.502]	[0.314]	[0.523]	[0.511]	[0.524]	[0.535]
Births	0.013		0.013		0.011		0.011	
	[0.009]		[0.009]		[0.008]		[0.007]	
Education	-0.722	-0.729	-0.664	-0.668				
	[0.199]***	[0.179]***	[0.234]**	[0.213]**				
Health			-0.114	-0.12				
			[0.128]	[0.144]				
Old Age					-2.632	-2.458	-2.65	-2.488
					[1.124]**	[1.161]*	[0.903]**	[1.020]**
Family							2.234	2.09
							[1.728]	[1.693]
Constant	15.359	13.071	20.809	18.859	34.836	23.868	30.037	28.05
	[12.855]	[14.159]	[16.396]	[18.880]	[11.641]**	[10.128]**	[13.371]*	[12.365]**
Observations	133	133	133	133	92	92	88	88
Within R2	0.771	0.757	0.779	0.766	0.766	0.757	0.76	0.749
Adjusted R2	0.733	0.718	0.74	0.726	0.708	0.702	0.693	0.683
F-stat	9.095	8.888	5.639	11.312	29.437	22.42	10.924	5.618
Prob > F	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.003
Number of clusters	10	10	10	10	10	10	10	10
Time 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 3. The religiosity of parents, 1920-1990: OLS regressions.

	(1) Parents	(2) Parents	(3) Parents	(4) Parents	(5) Parents	(6) Parents	(7) Parents	(8) Parents
GDP per capita	0.017	0.017	0.018	0.017	0.056	0.053	0.039	0.037
	[0.021]	[0.021]	[0.019]	[0.019]	[0.024]**	[0.023]**	[0.020]*	[0.020]*
Industries	0.378	0.389	0.322	0.331	0.217	0.222	0.093	0.095
	[0.111]***	[0.111]***	[0.096]***	[0.097]***	[0.202]	[0.211]	[0.176]	[0.189]
Tertiary_education	0.193	0.126	0.195	0.133	0.069	-0.031	0.045	-0.058
	[0.137]	[0.070]	[0.107]	[0.056]**	[0.170]	[0.135]	[0.155]	[0.138]
Urban	-0.212	-0.108	-0.213	-0.118	0.127	0.247	0.149	0.275
	[0.194]	[0.094]	[0.152]	[0.081]	[0.233]	[0.201]	[0.217]	[0.203]
Births	0.003		0.003		0.006		0.007	
	[0.003]		[0.003]		[0.004]		[0.003]*	
Education	-0.435	-0.436	-0.399	-0.4				
	[0.187]**	[0.195]*	[0.182]*	[0.189]*				
Health			-0.07	-0.071				
			[0.069]	[0.069]				
Old Age					-1.493	-1.391	-1.404	-1.31
					[0.543]**	[0.574]**	[0.406]***	[0.483]**
Family							0.96	0.877
							[0.782]	[0.737]
Constant	25.228	24.741	28.556	28.164	45.17	42.665	45.499	46.927
	[5.284]***	[5.193]***	[4.796]***	[4.970]***	[7.934]***	[7.579]***	[8.607]***	[7.440]***
Observations	133	133	133	133	92	92	88	88
Within R2	0.682	0.68	0.691	0.69	0.611	0.602	0.585	0.572
Adjusted R2	0.628	0.629	0.636	0.637	0.515	0.51	0.469	0.46
F-stat	41.838	52.766	11.614	16.342	24.425	12.563	10.376	37.486
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Number of clusters	10	10	10	10	10	10	10	10
Time 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 4. The religiosity of children, 1920-1990: 2SLS regressions.

	(1) Children	(2) Children	(3) Children	(4) Children	(5) Children	(6) Children	(7) Children	(8) Children
Children $_{t-1}$	1.003	1.006	1.004	1.005	0.977	0.986	0.975	0.979
	[0.011]***	[0.012]***	[0.011]***	[0.012]***	[0.013]***	[0.014]***	[0.013]***	[0.013]***
GDP per capita	0.007	0.008	0.007	0.007	0.012	0.016	0.011	0.015
	[0.009]	[0.009]	[0.009]	[0.009]	[0.011]	[0.011]	[0.011]	[0.012]
Industries	-0.02	-0.02	-0.006	-0.029	-0.157	-0.107	-0.127	-0.119
	[0.046]	[0.046]	[0.047]	[0.047]	[0.057]***	[0.056]*	[0.058]**	[0.057]**
Tertiary_education	0.059	-0.004	0.067	-0.007	0.067	-0.008	0.072	-0.005
	[0.030]**	[0.024]	[0.031]**	[0.024]	[0.033]**	[0.023]	[0.034]**	[0.024]
Urban	-13.50	-1.07	-14.54	-1.17	-13.89	1.07	-14.36	1.14
	[3.88]***	[1.72]	[3.97]***	[1.72]	[4.08]***	[1.40]	[4.39]***	[1.54]
Births	0.003		0.004		0.004		0.004	
	[0.001]***		[0.001]***		[0.001]***		[0.001]***	
Education	-0.12	-0.135	-0.13	-0.143				
	[0.055]**	[0.058]**	[0.054]**	[0.057]**				
Health			0.016	-0.011				
			[0.022]	[0.020]				
Old Age					-0.39	-0.414	-0.655	-0.653
					[0.174]**	[0.178]**	[0.165]***	[0.167]***
Family							0.467	0.276
							[0.229]**	[0.265]
Constant	0.234	0.099	-0.596	0.938	5.805	3.485	5.493	4.986
	[1.874]	[1.911]	[2.157]	[2.149]	[2.643]**	[2.549]	[2.650]**	[2.531]**
Observations	123	123	123	123	92	92	88	88
Hansen J-test	24.829	29.313	25.19	29.987	29.546	31.81	28.639	28.053
Prob J-test	0.305	0.136	0.288	0.119	0.13	0.081	0.155	0.174
Number of clusters	10	10	10	10	10	10	10	10
Time 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. The religiosity of parents, 1920-1990: 2SLS regressions.

	(1) Parents	(2) Parents	(3) Parents	(4) Parents	(5) Parents	(6) Parents	(7) Parents	(8) Parents
$Parents_{t-1}$	1.002	1.009	1.002	1.011	0.985	0.99	0.995	0.997
	[0.012]***	[0.011]***	[0.012]***	[0.011]***	[0.013]***	[0.013]***	[0.013]***	[0.012]***
GDP per capita	0.011	0.014	0.013	0.016	0.007	0.01	0.013	0.015
	[0.010]	[0.009]	[0.009]	[0.009]*	[0.009]	[0.009]	[0.010]	[0.009]*
Industries	0.05	0.063	0.06	0.075	-0.133	-0.116	-0.085	-0.075
	[0.056]	[0.055]	[0.056]	[0.056]	[0.053]**	[0.053]**	[0.055]	[0.056]
Tertiary_education	0.064	0.035	0.065	0.034	0.035	0.014	0.037	0.023
	[0.0325]**	[0.0205]*	[0.0312]**	0.021	0.027	0.022	0.030	0.022
Urban	-7.660	-2.350	-7.940	-1.990	-3.700	0.214	-3.210	-0.325
	[4.30]*	[1.18]**	[4.07]*	[1.36]	[3.25]	[0.94]	[3.91]	[1.05]
Births	0.001		0.002		0.001		0.001	
	[0.001]		[0.001]*		[0.001]		[0.001]	
Education	-0.138	-0.127	-0.132	-0.124				
	[0.041]***	[0.041]***	[0.040]***	[0.041]***				
Health			0.023	0.015				
			[0.018]	[0.019]				
Old Age					-0.139	-0.199	-0.131	-0.162
					[0.157]	[0.158]	[0.159]	[0.162]
Family							-0.193	-0.223
							[0.238]	[0.214]
Constant	-1.281	-2.313	-2.511	-3.284	4.382	3.794	2.492	2.17
	[2.212]	[2.141]	[2.429]	[2.424]	[2.594]*	[2.602]	[2.543]	[2.565]
Observations	123	123	123	123	92	92	88	88
Hansen J-test	24.049	24.577	23.153	24.164	25.644	26.329	28.553	27.901
Prob J-test	0.345	0.318	0.393	0.339	0.267	0.238	0.158	0.179
Number of clusters	10	10	10	10	10	10	10	10
Time 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.

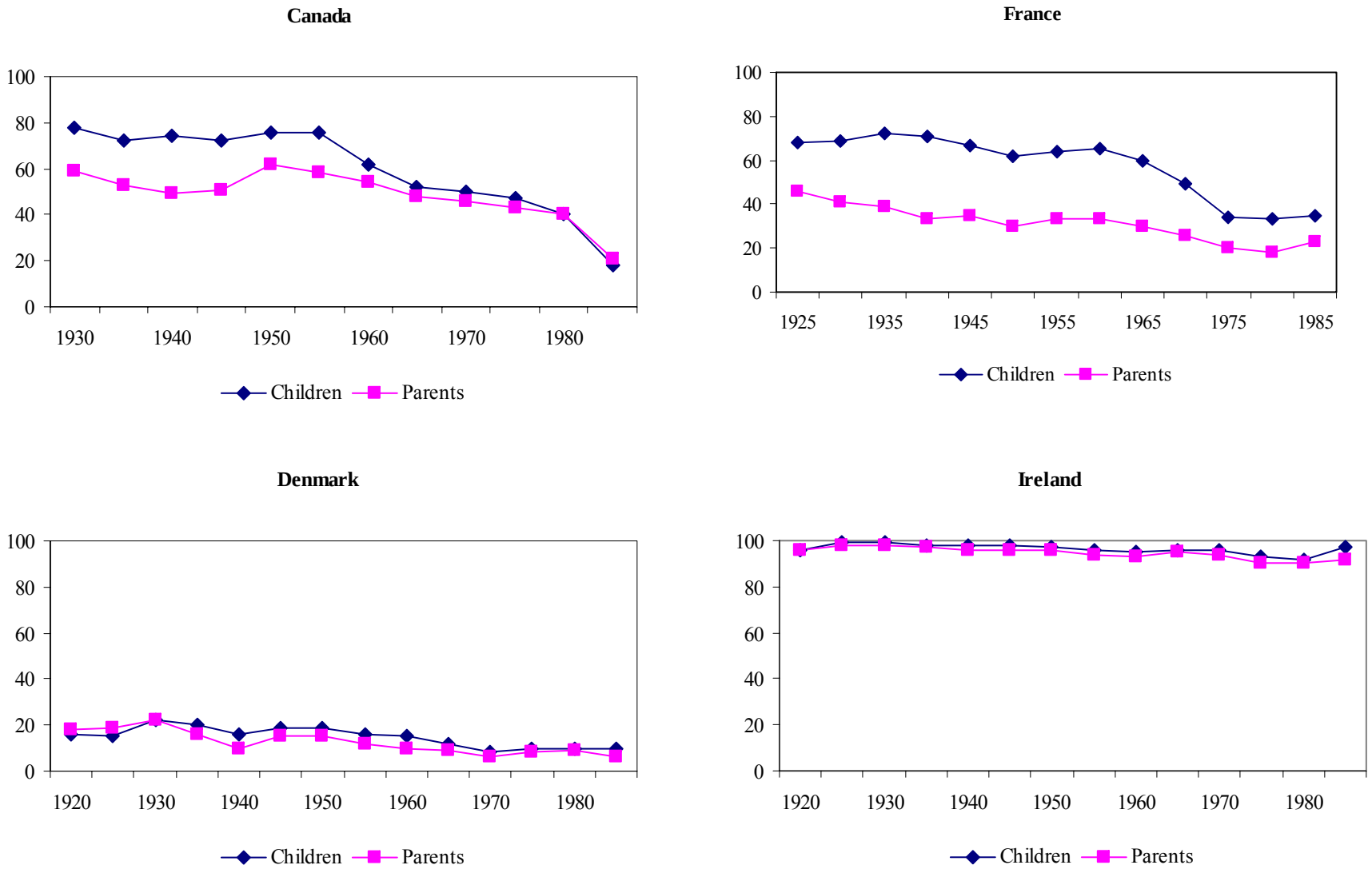
Table A1. List of variables.

Variables	Definition
Dependent variables	
Children	Parents' church attendance
Parents	Children's church attendance
Explanatory variables	
GDP per capita	Growth rate of GDP per capita
Industries	Share of the population working in the industrial sector
Tertiary_education	Individuals in universities and equivalent post-secondary educational institutions (in 100,000)
Urban	Population living in urban areas (in 1,000,000)
Births	Ratio of births per women in the population
Education	Share of education-related expenditures in the country's total public expenditures
Family	Share of family-related expenditures in the country's total public expenditures
Health	Share of health-related expenditures in the country's GDP
Old Age	Share of old age-related expenditures in the country's GDP
Instrumental variables	
Defense	Share of defense-related expenditures in the country's total public expenditures
Strike	Days of work lost per worker as a result of strikes

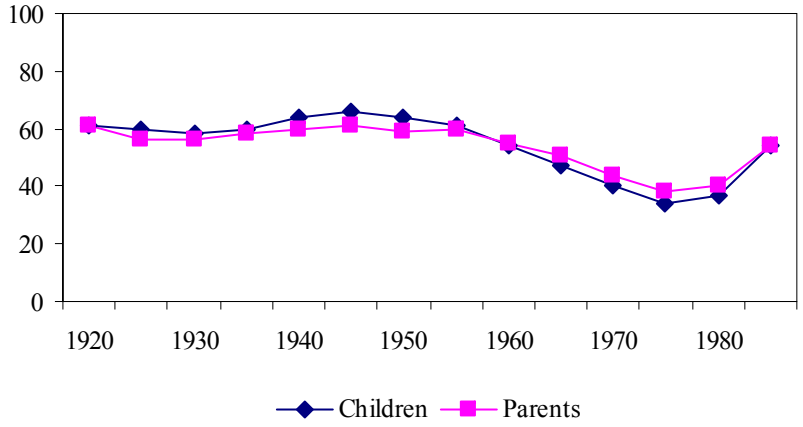
Table A2. Descriptive statistics

	Observations	Mean	Std. Dev.	Minimum	Maximum
Dependent variables					
Children	134	49.19	26.84	8	99
Parents	134	39.23	25.36	6	98
Explanatory variables					
GDP per capita	134	14.69	32.60	0.11	173.61
Industries	134	35.28	7.40	14.50	50.40
Tertiary_education	134	7.61	22.96	0.03	138.00
Urban	134	224.00	383.03	7.70	1870.54
Births	134	600.78	1016.18	41.32	4350.00
Education	133	10.86	6.96	0	27
Health	133	23.38	14.58	0.65	60.34
Old Age	92	4.07	2.63	0	9.25
Family	88	1.47	1.08	0	4.46
Instrumental variables					
Defense	133	25.45	21.31	3.30	97.13
Strike	133	3919515	9262921	163	66400000

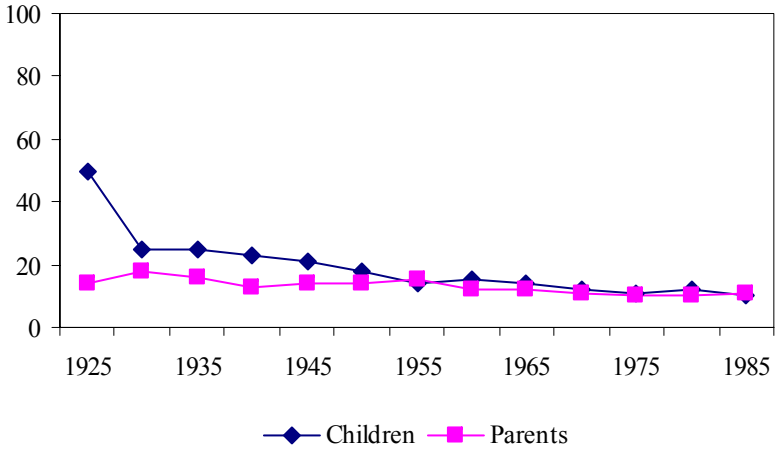
Figure 1. Church attendance, 1920-1990



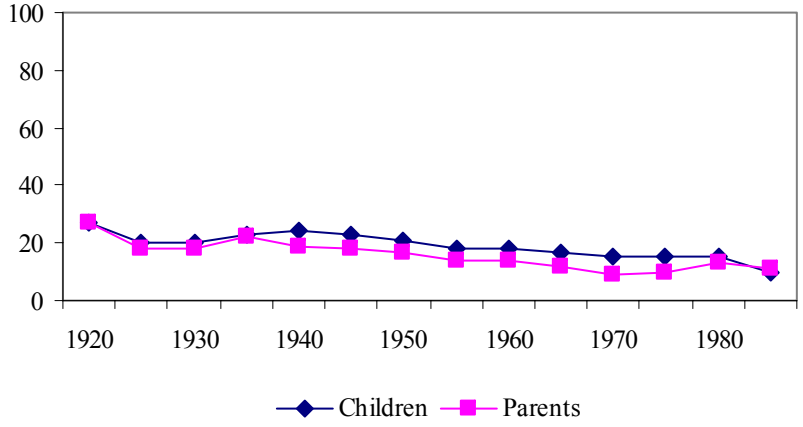
Netherlands



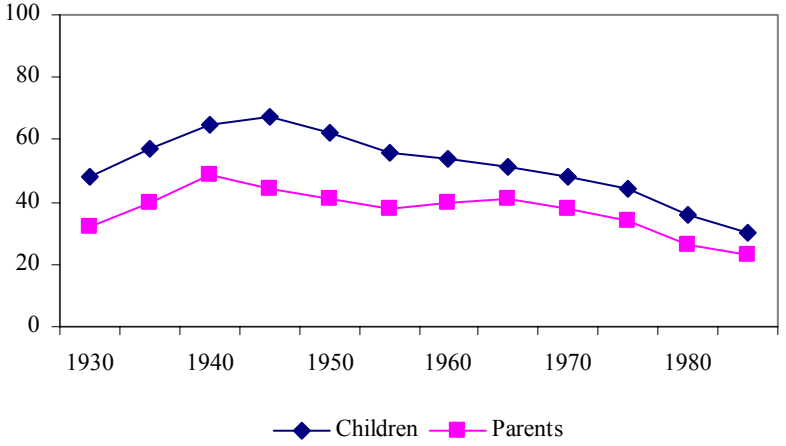
Sweden



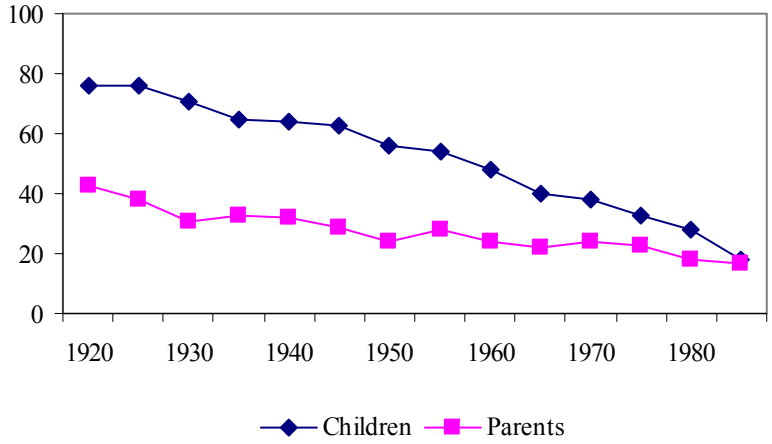
Norway



Switzerland



United Kingdom



USA