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CHURCH ATTENDANCE IN SPAIN
(1930–1992):
GENDER DIFFERENCES AND
SECULARIZATION

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Church attendance in Spain (1930-1992): Gender differences and secularization*

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Abstract

This paper uses retrospective data from the ISSP98 database to reconstruct church-attendance trends in Spain from 1930 to 1992. Time series analysis is performed to examine religious changes in two parallel ways: first, to determine both male and female church-attendance trends and second, to study the gender effect, that is, differences between males and females regarding church attendance. Our results indicate that: i) both male and female church attendance is declining at a rate of 2% annually; ii) gender differences remain unaltered for the period analyzed.

Keywords: Spain, church-attendance trends, gender differences, secularization.

JEL Class.: Z12, C32

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1 Introduction

This paper presents an overview of religious trends in Spain during the XX century based on *retrospective* data provided by the ISSP database. The advantage to using this particular database lies in the fact that it uses retrospective questions such as *When you were children, how often did your mother (or father) attend religious services?* Using Iannaccone’s [9] methodology we are able to reconstruct religious trends for the whole of the XX century. However, only data regarding mass attendance and not prayer is available in this database.

Although interest into non-market activities has been on the rise among economists in recent years, the analysis of religious behavior has been widely neglected. This is illustrated by the fact that theoretical contributions on individual religious behavior are extremely scarce, with the exception of Azzi & Ehrenberg [2] and its derivations: Neuman [11], Sawkins *et al.* [16], Rodero *et al.* [13]. Other specific fields of religious activity, such as market structure, have been practically unexplored in theoretical terms (Pita-Barros & Garoupa [12] and Rodero & Brañas-Garza [13] are rare exceptions).

Nevertheless, empirical research into this issue is growing. The vast majority of investigations in this line are devoted to estimating church-attendance equations in specific countries (see for example Brañas-Garza & Neuman [5] for Spain among many others); analyzing the relationship between religiosity and education (see the work by Sacerdote & Glaesser [15]; or cross-country comparisons such as those by Barro & McCleary [3] – among others (see Iannaccone [8] for an extensive survey). Due to data limitations, temporal estimations are rare (with the exception of the above-mentioned paper by Iannaccone [9] or Heineck’s panel-data approach [7]).

The use of retrospective data allows us to explore new empirical issues, namely the evolution of religious activity through time series analysis. Thus, in this paper we analyze the temporal trend of church attendance by both males and females in Spain from 1930 to 1992.

These “dynamic” data permit us to study two specific issues which have motivated much of the previous research in this area: the *secularization thesis* and gender differences in religious activities. According to the former, religion must inevitably decline as science (and technology) advance. Hence, as Starck *et al.* [17] or Sacerdote & Glaesser [15] have investigate that individuals become increasingly less religious as they acquire increasingly more education –however results are quite ambiguous. At the aggregate level, the

religiosity of societies declines as a result of modernization (see Lenski [10] and more recently Chaves [6]).

Several arguments have been put forward to explain *gender differences* (see Beit-Hallahmi [4]). These include purely economic arguments such as the low rate of female employment and wages (the opportunity cost of time) to explain why females dedicate more time to religious activities; sociological issues such as differences in socialization patterns (i.e. females are expected to engage more in congregational activities than men);¹ psychological arguments (gender-based personality traits or different religious tastes, that is, women are more spiritual), and finally, anthropological explanations such as the maternal role of females (women are the main guardians of cultural norms).

Our main results are: i) the secularization thesis is empirically confirmed for the Spanish case given that both the male and female time series are stationary with a significant (negative) deterministic trend; ii) gender differences have not varied during the period at hand; hence economic arguments based on opportunity cost of time do not explain the Spanish case.

Both secularization and gender differences are analyzed here. The paper comprises five sections. Following the introduction in section one, the database and retrospective methodology are presented in section two. Objectives and methodology are summarized in section three, while the results are analyzed in section four. Finally, conclusions are reached in section five.

2 Database and Retrospective Analysis

The data used in the present study was collected in 1998 by the Centro de Investigaciones Sociológicas (CIS) (Center for Sociological Research, Spain) under the International Social Survey Program: Religion, supported by the UNESCO (CIS code #2301). The data was collected from 2488 personal interviews conducted in cities or urban cores in the forty-seven provinces that comprise Spain. Due to missing values for some of the questions, over

¹Sociological arguments are also included in economic theoretical models, such as that by Azzi-Ehrenberg [2]. This model explains individual religious activity as the sum of three motives or factors: *salvation* (the prospect of afterlife consumption), *professional* (strategic behavior) and *consumption*: individuals derive satisfaction from religious practice for purely social reasons, like club-based economic models based on social network externalities (see the above survey by Iannaccone [8]).

two thousand valid observations remained².

The database used in this study included a set of retrospective questions that allowed us to reconstruct church attendance trends throughout the XX century. This method was first proposed by Laurence Iannaccone [9]. The retrospective questions were:

- item 28: “*When you were a child³, how often did your mother attend religious services?*” [categorized values: (1) never attended; (2) once a year; (3) twice a year; (4) several times a year; (5) once a month; (6) two or three times a month; (7) almost every week; (8) every week; (9) several times a week].
- item 29: “*When you were a child, how often did your father attend religious services?*” [identical categorized values]

A total of 2290 observations were made for item 28, while 2240 observations were made for item 29.

To reproduce the past history of church attendance the following procedure was used: The age of each i -subject (age_i) was taken and the answers to item 28 & item 29 were then translated to the proper year. This was done using the following equation:

$$year_i = 1998 - age_i + 12,$$

Once $year_i$ was obtained for each i -subject, we could easily classify item 28 and item 29 by year, that is, by including each of the answers by i -subject (mother and father church attendance) as subjects belonging to the given year⁴. The total number of observations for both mothers and fathers for

²Brañas-Garza & Neuman [5] use this database to perform a cross-section analysis of religiosity determinants in Spain. The authors found that close to 100% of respondents are Catholic and have a Catholic spouse. However, respondents differ in their level of religiosity in terms of prayer observance and mass attendance - women were found to be more religious than men for these two dimensions of religiosity. The “salvation motive” was found to be relevant for both males and females, although “professional motive” is more likely to be associated with males.

³Iannaccone [9] “defined” a child as a 12 year old.

⁴For example, let us suppose a 24-year old subject states that his mother attended church at level 7 and his father at level 3. Using the above formula we obtain one observation for males for 1986 and one observation for females for the same year. If, for example, we count twenty 24-year old subjects, we obtain 20 observations for both males and females in the year 1986 (as long as no answers are left blank).

each year are then used to calculate the average of that year. This mean is then used to indicate the average behavior of mothers and fathers for each year (Table 1 in the Appendix illustrates the average (*mean*) and number of observations (*n*) for both mothers and fathers).

From this point on, we will refer to males as “fathers” and females as “mothers”. By using this method we obtain a full historical map of church attendance in Spain from 1915 to 1992. However, three additional observations must be taken into account:

- We only account for church attendance and not prayer.
- Observations from 1915 to 1929 have been omitted as very few cases are available for that time period (see table A1)
- Our time series for males (m_t) and females (w_t) begin at 1930 ($t = 1939, \dots, 1992$; annual data).

Although this methodology for reconstructing historical data is quite controversial, we should bear in mind that no other source of historical micro-data is available and that retrospective data gives us the opportunity to recover hence unexplored trends. For a more in-depth account of the advantages and drawbacks to this approach see Iannaccone [9]

3 Objectives & Methods

This paper uses a retrospective method to study the secularization thesis and gender differences with time series analysis to achieve both objectives.

To test the *secularization* thesis we analyze stochastic roots and deterministic trends for m_t and w_t . The Augmented Dickey Fuller test (ADF hereafter) is used to check stochastic roots, $I(d)$ –for $d \geq 0$. If $d > 0$, i.e. stochastic roots of d -order, we should not perform predictions. If $d = 0$, i.e. stationary series, we will check if any deterministic trend explains the average path.

To analyze *gender* differences we perform gender regression⁵: $w_t = \alpha + \beta m_t + \varepsilon_t$. Regression residuals ($\hat{\varepsilon}_t = e_t = w_t - \hat{w}_t$) are subsequently used

⁵Note that this methodology is adequate if: i) both w_t and m_t are $I(0)$ or, ii) if the regression residuals are $I(0)$ or there is “cointegration”.

to test gender differences. The time series analysis of these residuals will provide us with some insight as to differences between males and females.

Both objectives are analyzed in the following section.

4 Results

4.1 Testing the Secularization Thesis

Spain has undergone enormous changes in the last 40 years, especially following Franco's death in 1975. As a result of the democratic process occurring in the country, Spain quickly became one of the most modern countries in Southern Europe?. A key feature of this modernization process has been increasing investment in R+D activities. Figure 1 illustrates the total expenditure in R+D activities in Spain from 1964 to 1994 measured in thousands of Euros (1986 base)⁶.

Insert figure 1 about here

Unfortunately, no previous official data is available for the whole century. This limitation prevents statistical comparisons between male/female church attendance and R+D time series. Thus, the above figure is *merely illustrative*. However, we do believe that it clearly illustrates Spanish technological development.

Figure 2 shows church-attendance trends for both males (m_t) and females (w_t) from 1930 to 1992 (63 periods). The left-hand axis measures church attendance from level 0 "never attended" to level 9 "several times a week" (see section 2). The shaded area to the left represents the Spanish Civil War (1930-1936), while the shaded area to the right represents the "transition" to democracy (late 1970s).

Insert figure 2 about here

At first sight there seems to exist a clearly decreasing trend for both time series, suggesting that the secularization hypothesis fully explains the Spanish religious trend. Nevertheless, these graphical findings should be revised using time-series analysis. We ran the ADF test –with constant and linear trends–

⁶Source: Instituto Nacional de Estadística (Spanish National Bureau of Statistics): www.ine.es.

for both series (at level). This test uses the null hypothesis that the time series has a one-unit root [I(1)]. Our results are as follows:

- ADF (male at level, constant & trend): $t - stat = -7, 21$; $p = 0.00$.
- ADF (female at level, constant & trend): $t - stat = -4, 38$; $p = 0.00$.

In both cases the null hypothesis is rejected. Hence, both series are stationary [I(0)] and have a deterministic trend. Therefore, we are able to estimate the sign and value of these deterministic trends. To perform this analysis the following equations are estimated:

$$m_t = \alpha + \beta T + \varepsilon_t; \quad w_t = \alpha + \beta T + \varepsilon_t$$

where $T = 1, 2, \dots, 63$. The estimated equations are:

Insert table 1 about here

In both males and females, the intercept and the linear trend are significant for $\alpha = 1\%$. However, the most interesting result is that the sign of $\hat{\beta}$ (deterministic trend) is **negative** and identical for both time series. *According to this value, church attendance is decreasing at a rate of 2% annually.*

In short, as both series are stationary and have a significant (negative) deterministic trend, I do believe that these results are a good argument in favor of the secularization thesis for the Spanish case.

4.2 Gender differences

Theoretical models of consumer behavior under religious constraints (see Iannaccone [8] for details) predict less religious observance by males than females due to wage discrimination factors. In contrast, the remaining arguments put forth to explain gender differences do not account for economic variables.

This idea can be analyzed using the previous variables w_t and m_t . Recall that Spain has changed enormously in the last years. This is not only due to the fact that the country has undergone remarkable economic growth, but also because of an astonishing process of transition towards a democratic regime. Moreover, Spanish modernization has led to the wide-spread participation of females in the job market, especially after 1960 (see Azmat, Guell &

Manning [1]⁷. Before this time, the great majority of women were dedicated to caring for their families full time.

Hence, if the purely economic predictions are correct, some kind of convergence should be observed between males and females in the last years. On the contrary, if non-economic arguments are more adequate, then we should find no variation between males and females as a result of increased participation by women in the work force.

Figure 2 above shows the difference between males and females; a difference that appears to remain stable throughout the century. Nevertheless, a statistical analysis must be performed in order to study this process in greater depth. Recall that both m_t and w_t are $I(0)$, thus we can perform an OLS analysis (males vs. females) in order to capture the residuals, that is, the “gender effect”⁸. The analysis is summarized below in Table 2:

Insert table 2 about here

Residuals are in constant variance (the White test does not reject the null hypothesis of homoedasticity), not serial autocorrelation (see Breusch-Pagan and ARCH tests) and also stationary, that is, $I(0)$ (residuals are shown in Figure 2).

Insert figure 3 about here

Hence, if the difference between males and females is stationary with a zero-average then we may argue that no change has occurred in the last 63 years. Since it can be argued that females have only begun to enjoy real economic opportunities in the last 25 years, their religious behavior seems to

⁷This paper studies gender differences in labor participation in OECD countries. The term gender gap is used to indicate differences between male and female participation. The following observations were made for the Spanish case: *i*) 1960 to 1985: increasing labor participation and “no gender gap”. *ii*) 1985 to 1988: increasing labor participation and “increasing gap”. *iii*) 1988 to 1992: decreasing labor participation (rising unemployment) and “stable and positive gap”. *iv*) 1992 to 1995: increasing labor participation and “stable and positive gap”.

If there was no discrimination until 1985, and our database ends in 1992, this would suggest that female participation in the job market has continued to grow since 1960.

⁸There are no other possible explicative variables other than male mass attendance. The ISSP retrospective questions only consider church attendance by father, mother or children. Given that most economic models of religious consumer behavior are based on household units (father and mother) we decided to use “male” as explicative of female attendance.

follow the same pattern as males. This result clearly supports non-economic arguments to explain gender differences.

5 Conclusions

This paper uses responses to a retrospective questionnaire provided by the ISSP database to study church-attendance trends in Spain from 1930-1992. The analysis is performed for both males and females. The objectives of the study are twofold: to confirm the secularization thesis and examine gender differences in religious activities. Our main results indicate that:

- The time series for both males and females are stationary with a significant deterministic trend. The estimated value for this trend is: $\hat{\beta} = -0.02$., indicating that church attendance is declining at a rate of 2% annually.
- Differences between males and females remain unaltered throughout the period studied. We analyze the residuals of the OLS regression (female vs. male) and check that these residuals are in constant variance and stationary. In contrast, we observe increasing opportunities for females in the job market. This would seem to suggest that economic arguments based on time opportunity cost are not sufficient to explain these differences.

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6 Appendix

year	MALES		FEMALES		year	MALES		FEMALES	
	mean	n	mean	n		mean	n	mean	n
1915	8,00	1	9,00	1	1954	5,52	25	6,62	26
1916	NA	0	NA	0	1955	5,09	43	6,45	44
1917	8,00	1	8,00	1	1956	5,17	42	6,26	43
1918	NA	0	NA	0	1957	5,22	27	6,00	30
1919	2,00	1	4,00	3	1958	5,10	30	6,24	29
1920	8,00	2	7,67	1	1959	4,53	34	6,27	33
1921	NA	0	1,00	1	1960	5,16	38	6,18	40
1922	6,25	8	7,25	8	1961	4,10	30	5,86	29
1923	7,00	2	7,50	2	1962	5,04	27	5,96	27
1924	2,33	3	5,33	3	1963	5,36	36	6,00	37
1925	5,50	8	7,57	7	1964	4,93	27	6,32	28
1926	5,57	7	6,75	8	1965	4,65	37	5,77	39
1927	6,00	9	7,13	8	1966	4,74	35	5,71	35
1928	6,09	11	7,58	12	1967	5,17	36	6,68	41
1929	5,56	9	7,22	9	1968	4,78	40	6,23	40
1930	6,12	17	7,44	18	1969	4,62	26	6,08	25
1931	6,85	13	7,38	13	1970	4,40	48	6,11	45
1932	6,27	11	6,50	12	1971	4,42	33	5,97	32
1933	5,14	21	6,15	20	1972	4,74	38	6,20	40
1934	5,56	18	6,79	19	1973	4,70	40	6,56	43
1935	4,71	17	5,56	16	1974	4,73	41	5,85	41
1936	3,21	14	4,93	14	1975	4,46	41	5,79	42
1937	6,38	13	6,79	14	1976	4,29	42	6,07	42
1938	4,95	22	7,00	24	1977	4,33	49	5,56	50
1939	5,19	26	6,93	29	1978	4,98	45	6,22	45
1940	5,28	25	7,38	26	1979	4,59	44	6,00	47
1941	5,24	29	6,66	32	1980	4,57	53	6,38	53
1942	6,00	26	6,68	28	1981	3,88	42	5,69	42
1943	6,47	34	7,52	33	1982	3,81	48	5,42	48
1944	5,48	31	5,81	32	1983	5,02	50	6,58	50
1945	5,29	38	6,19	43	1984	4,44	36	5,43	37
1946	5,88	41	7,00	44	1985	4,53	68	5,70	69
1947	4,58	33	5,97	35	1986	3,83	52	5,53	51
1948	5,24	25	6,31	26	1987	4,17	42	5,21	42
1949	5,24	21	6,96	24	1988	4,51	51	5,65	51
1950	5,22	32	6,70	33	1989	3,81	48	5,71	48
1951	4,45	22	6,10	20	1990	3,73	48	5,07	46
1952	4,31	35	5,97	36	1991	3,65	55	5,26	54
1953	5,89	18	6,39	18	1992	3,88	49	5,02	53

7 Tables & Figures

	MALE	FEMALE
$\hat{\alpha}$	6.13	7.1
$p - value$	0.00	0.00
$\hat{\beta}$	-0.02	-0.02
$p - value$	0.00	0.00
R^2	0.39	0.46

TABLE 1: ESTIMATED VALUES

$\hat{w}_t = \hat{\alpha} + \hat{\beta}m_t$			
$\hat{\alpha}$	0.65(0, 00)		
$\hat{\beta}$	2.95(0, 00)		
		$R^2 = 0.66$	
RESIDUALS (e_t)			
MEAN	$1.1E - 16$	BREUSCH-GODFREY	$F = 0.48(0.61)$
ST. DEV.	0.34	ARCH	$F = 0.41(0.52)$
		WHITE	$F = 1.67(0.19)$
		ADF	$t = -6.6(0.00)$

(*) p-value between brackets.

TABLE 2: OLS ESTIMATION

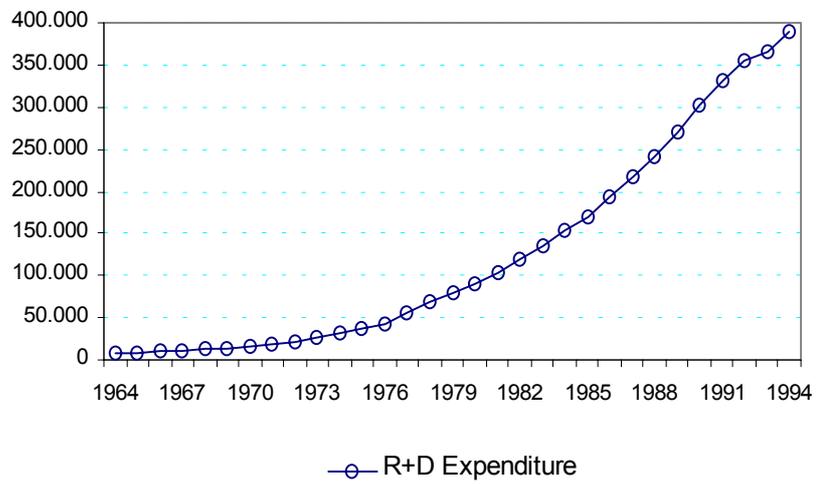


Figure 1:

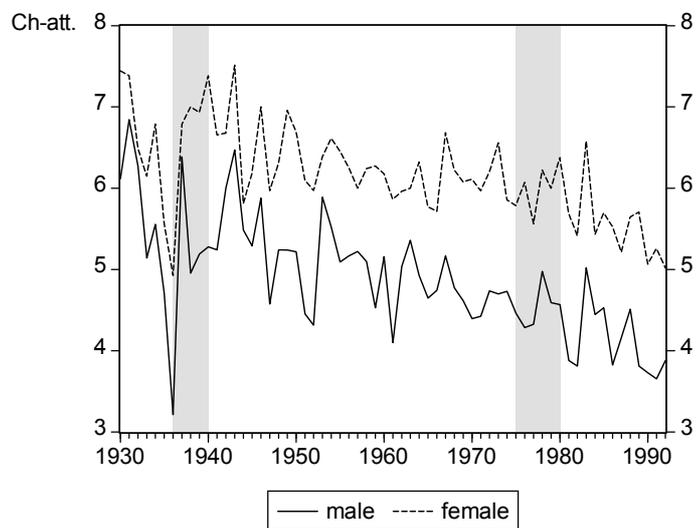


Figure 2: Male/Female Church-Attendance

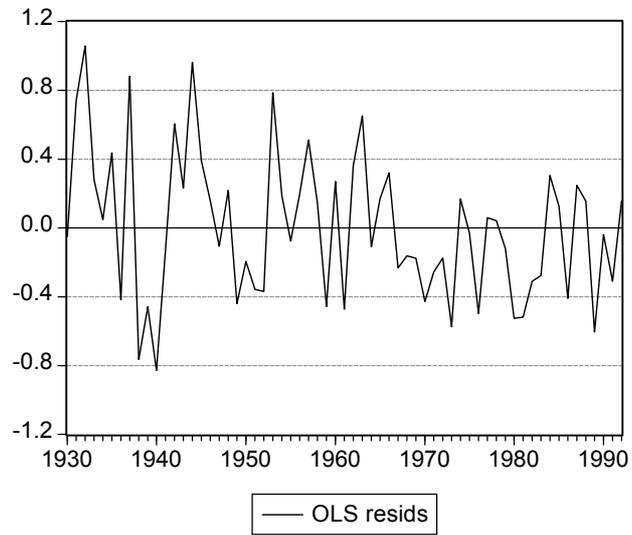


Figure 3: OLS residuals