Reasons for embracing a religion: The case of Brazilian women

Guilherme Irffi [a], Mércia Santos da Cruz [b,*], Eveline Barbosa Silva Carvalho [c]

[a] *Applied Economics Department – Federal University of Ceará – UFC, Avenida da Universidade, 2700, 2° floor, Benfica, Fortaleza,
CE CEP: 60020-181, Brazil*
[b] *Department of Economics – Federal University of Paraíba – UFPB, Cidade Universitária, João Pessoa, PB CEP: 58051-900, Brazil*
[c] *Department of Economic Theory – Federal University of Ceará – UFC, Avenida da Universidade, 2700, 2° Andar, Benfica, Fortaleza,
CE CEP: 60020-181, Brazil*

Abstract

The Economics of Religion is based on the model proposed by Azzi and Ehrenberg in 1975, which aimed to assess the religious frequency. Therefore, this article proposes to estimate the determinants of religious frequency of Brazilian women. To achieve this goal, information from the National Survey of Demography and Health of Children and Women as of 2006 (PNDS-2006) is employed and from an ordered logistic regression model, socioeconomic determinants, demographic, cultural and behavioral factors that may interfere in such demand are estimeted. According to the results, it can be inferred that religious frequency of Brazilian women receive interposition of their demographic characteristics, in particular rises with age. In relation to income, it was not observed any correlation pattern, while higher level of education reduces the likelihood of the woman never go to church. Thus, we found no evidence that the level of occupation, marital status and death of children affect significantly the frequency to religious services of women surveyed. And finally, the main feature of women impacting the demand for religious activities and services stems from the inspiration that the woman had, that is, if she was raised in a religion, especially Catholic or evangelical.
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Resumo

A Economia da Religião baseia-se no modelo proposto por Azzi e Ehrenberg em 1975, o qual objetivava aferir sobre a frequência a religiosa. Isto posto, o presente artigo se alvitra a estimar os determinantes da frequência religiosa da mulher brasileira. Para tanto, empregam-se as informações da Pesquisa Nacional de Demografia e Saúde da Criança e da Mulher de 2006 (PNDS-2006) e a partir de um modelo de regressão logística ordenada estimam-se os determinantes socioeconômicos, demográficos, culturais e comportamentais que possam interferir em tal demanda. De acordo com os resultados obtidos, pode-se inferir que a frequência religiosa das mulheres brasileiras recebe interposições de suas características demográficas, em especial, se eleva com a idade. Em relação à renda, não se observa nenhum padrão de correlação, ao passo que maior nível de escolaridade reduz a probabilidade de

* Corresponding author.
E-mail addresses: guidirffi@gmail.com (G. Irffi), mercia_sc@hotmail.com (M.S. da Cruz), eveline@ufc.br (E.B.S. Carvalho).

a mulher nunca ir à igreja. Destarte, não foram encontradas evidencias de que o nível de ocupação, estado civil e morte de filhos afetem de modo significativo a frequência a serviços religiosos das mulheres pesquisadas. E, por fim, a principal característica da mulher que impacta a demanda por cultos e serviços religiosos decorre da inspiração que a mulher teve, isto é, se ela foi criada em alguma religião, principalmente, católica ou evangélica.

1. Introduction

Religion can have a healthy effect on civil society by encouraging its members to participate in worship, spend time with their families, as well as learning their own moral lessons of religious traditions (Wuthnow, 1999).

According to Azzi and Ehrenberg (1975), religious behavior of individuals stands out for greater participation of women and socioeconomic features such as income which presents a positive but weak correlation. On the other hand, demographic attributes such as skin color and age also show a positive correlation, with blacks attending church more than whites, and higher ages showing increase on the frequency in religious activities. However, the authors[1] argue that there is an exception for older people due to the possibility of health problems that may hinder mobility. Regional aspects also tend to have an impact on behavior, showing that people living in rural areas attend church more than the inhabitants from urban areas.

Based on these results measured by Azzi and Ehrenberg (1975) model's, this study aims to estimate the determinants of the religious attendance in Brazil. However, the stylized facts indicate that when studying the demand for religious services in any society, there is a greater female participation bias, since most of the members of different religions are women, especially concerning catholic and evangelical religions.

Therefore, we seek to assess the determinants of religious frequency considering only women between 15 and 49 years old.[2] This cut comes from the choice of database, since it was used information collected by the National Survey of Health and Women's Demography as of 2006 (PNDS) conducted by the Brazilian Center for Analysis and Planning (CEBRAP), ordered by Brazilian Ministry Health.

A critical feature of the PNDS for this study is the fact that the questionnaire includes an item that asks the religion in which the woman was created and what is her current religion. From this information, one can grasp the "religious migration," given that it can be controlled by some religions such as Catholic, Traditional Protestant, Pentecostal Protestant, Spiritualist, Afro-Brazilian religions and also other religions.

In Brazil, where Catholic Religion prevails, it has been seen a growth of Protestant members (here termed as evangelicals). According Narita and Anuatti (2004), any study of religions in Brazil must take into account the explosive growth of new Pentecostal institutions during the 1980s and open competition, especially in the 1990s, of the Catholic movement called charismatic renovation.

In addition, PNDS provides control for socioeconomic, demographic, behavioral and regional factors, which allows testing different assumptions of the model proposed by Azzi and Ehrenberg (1975), as well as by cultural features such as controlled by Featherman (1971). And so, it is also possible to address the issues of religious choice from the above characteristics and test the influence of religious choice in the accumulation of human capital, as done by Narita and Anuatti (2004) using the 1980 and 1991 population census as well as the special National Survey of Households (PNAD) questionnaire as of 1988, to explore some stylized facts of religious affiliation in Brazil.

Besides this information, this article also stands out for addressing other issues such as marital status, the situation of women in the labor market as well as by considering the event of losing a child, as factors that may influence the demand for religion.

Thus, it can be said that this study contributes to the research agenda on the field of Economics of Religion, related to the research on the determinants of religious frequency of women in childbearing age, taking into account

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[1] View Azzi and Ehrenberg (1975), Narita and Anuatti (2004) and Morelli et al. (2013) among others.

[2] For being considered the fertile age according to the Ministry of Health.

Table 1
Distribution of religious self-declaration in Brazil – 2006.

Current religion	Total	(%)	Religion that was educated	Total	(%)
Catholic	7,627	65.3	Catholic	9,557	81.8
Evangelical	2,649	22.7	Evangelical	1,698	14.6
Spiritualist	332	2.8	Spiritualist	135	1.2
African-Brazilian	43	0,4	African-Brazilian	23	0.2
No religion	829	7.1	No religion	184	1.6
Other religions	197	1.7	Other religions	80	0.7
Total	11,677	100.0	Total	11,677	100.0

Source: Considering information the 2006 PNDS.

socio-economic, demographic, cultural, regional and behavioral factors as well as the religion in which the woman was created and the effect "religious migration".

To achieve this goal, the present article was divided into five more sections besides this one. The following section deals with the source and the processing of data, as well as a descriptive analysis to explore the characteristics of women. The third section describes the empirical strategy using ordered discrete choice models. Subsequently, the results are presented and analyzed. And finally, the final considerations are described.

2. Methodological aspects

2.1. Source and data processing

To assess the determinants of religious frequency of Brazilian women, they use the information from the National Survey of Demography and Health of Children and Women 2006[3], here in after PNDS (2006).

It is important to note that this research was conducted in households of the five geographical regions of the Brazil, through visits in urban and rural census tracts. In view of the objective of the research of investigating the health characteristics of women, eligible households should contain at least one woman of childbearing age.

In fact, the data collected by PNDS include an information framework on various characteristics of Brazilian women, not only concerning health, but also related to religion (in which was educated as well as the current religion) and the frequency of religious activities.[4]

With regard to religious affiliation, whether the one which was educated or the one which is currently affiliated, there are six groups available, namely: (1) Catholic (2) Traditional Protestant, (3) Pentecostal Protestant, (4) Spiritualist, (5) Afro-Brazilian religions, and (6) other religions. Whereas the frequency of services or religious activities is reported according to these options: (i) Never; (ii) Less than once per month; (iii) one to three times per month; (iv) once per week; and (v) more than once a week. Therefore, it can be seen that there is a set of information, self-reported on the practice (frequency) to religious services, considering the 2006 PNDS information.

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The amount and percentage of women, considering the religion in which was educated and the current one, are reported on Table 1. Note that, the Traditional Protestant and the Pentecostal Protestant, known as Evangelical were considered as one. This way, religions are subdivided in: Catholic, Evangelical, Spiritualist, Afro-Brazilian, no religion and other than those mentioned.[5]

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[3] The year of 2006 is the most current research period. The PNDS database also includes issues relating to children under 5 years, drug and another set of specific information for pregnant women. The PNDS is a survey commissioned by the Ministry of Health of the Brazilian Government, whose direction and execution was conducted by the Brazilian Center for Analysis and Planning (CEBRAP).

[4] It is noteworthy that there are similar researches in other nations, for example, Religion, Politics and Gender Equality, the United Nations Research Institute for Social Development, held from 2007 to 2009. See: http://www.unrisd.org/research/gd/religionandgender.

[5] A limitation for measuring religious attendance is that the concept of religious member is not the same between different religions. For example, for the Catholic Church, an individual is considered member provided that he has been baptized (which therefore includes children of any age). On the other hand, the Evangelical is an adult who made a profession of faith.
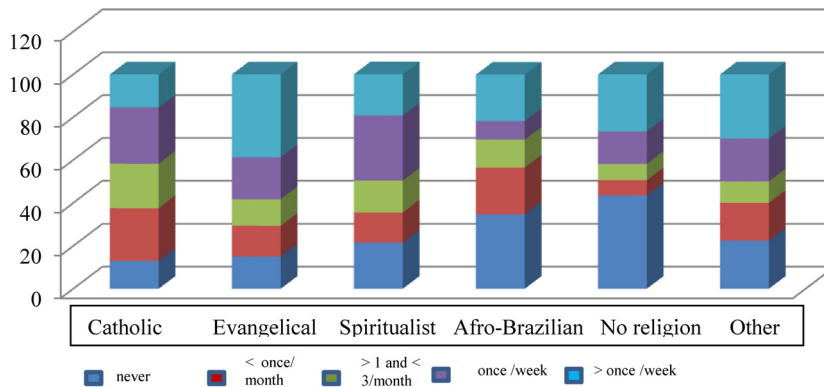
Fig. 1. Frequency to religious activities or services, by religion, considering the religion in which it was educated.
Source: Considering information the 2006 PNDS.

According to Table 1, 7627 of the respondents (65.3%) declared to be Catholic, while 2649 women (22.7%) declared to be evangelical, so it can be seen that 88% of women either belong to the Catholic or Evangelical religion. On the other hand, 9557 (81.8%) of the surveyed were educated in the Catholic religion, while 1698 were educated in the evangelical religion (14.6%) and only 422 (3.6%) of women reported that did not receive neither Catholic nor evangelical education or did not receive any religious orientation. Thus, performing a counterpoint between the current religion and religion in which the woman was educated, it appears that a 'religious migration' process, is mostly directed to Protestant religions.[6]

Regarding the frequency to religious activities and considering the religion in which the woman was educated using the same religious options already defined in Table 1, note in Fig. 1, that among the ones educated in the Catholic religion 13% never go to church, 24, 6% attend less than once per month, 20.7% attend one to three times per month, 26.3% attend once a week, while 15.4% attend more than once a week.

On the other hand, among women educated in evangelical religions, 15.1% never go to church, 14.3% attend less than once per month, 12.3% attend one to three times per month, 19.6% attend once a week and 38.7% attend more than once a week.

Considering women that were educated in other religions note that there is a tendency of never attending religious services. Finally, with regard to women who reported not having received any religious education, it is observed that the vast majority do not attend any religious service or activity (43.5%).

In general, with respect to frequency in religious activities, considering the religion in which the woman was educated, it is noted that the Brazilian mostly go to church once a week, regardless the religion in which was educated. On the other hand, the ones educated in evangelical precepts go to church more than once per week.

When considering the current religion, as shown in Table 2, it appears that the percentage of women who never attend church, regardless of religion, is 14%. However, most women, 25.1%, attend once a week.

It is observed that most of the Catholic women attend religious activities less than once per month (28.6%), while only 8.9% attend more than once a week. However, among the evangelical, more than half reported attending religious services more than once a week (52.7%) and only 2.8% of the evangelical never attend church.

Regarding the frequency to other religious cults, it is worth noting the high church attendance (42.13%) among women who have 'other' religions. Regarding the Spiritualist and Afro-Brazilian, the pattern is attending once a week. Another relevant observation is that 18.4% of women who reported not having any religious link attend services or religious activities at least once a month.[7]

According to Oliveira et al. (2013) the demand for religious services is related to many factors such as, for example, socioeconomic characteristics, income and education. There is also theoretical indication that the demand for religion is related to age, gender and skin color, in accordance with Azzi and Ehrenberg (1975). In addition to these factors, and

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[6] Using information from Brazilian Institute of Geography and Statistics – IBGE, Demographic Census of 1991 and 2000, found that higher rates of reduction in the proportion of Catholics were in the North and Midwest regions of Brazil. Also according to that author, the areas where the population has remained Catholic, that is, had the lowest migration rate were the rural ones.

[7] Because of this observation, it was decided to consider in the database, women who reported having no religion currently.

Table 2
Frequency of religious activity, considering the current religion[a].

		Attendance to religious activities					Total
		Never	Less than one/month	One to three/month	One time/week	More than once/week	
Full sample	Total	1631	2645	2235	2932	2234	11677
	(%)	14,0	22,7	19,1	25,1	19,1	100
Catholic	Total	899	2186	1786	2080	676	7627
	(%)	11,7	28,6	23,4	27,2	8,9	100
Evangelical	Total	74	220	315	643	1397	2649
	(%)	2,8	8,31	11,8	24,2	52,7	100
Spiritualist	Total	53	55	56	107	61	332
	(%)	15,9	16,5	16,8	32,2	18,3	100
Afro-Brazilian	Total	8	8	8	14	5	43
	(%)	18,6	18,6	18,6	32,5	11,6	100
No religion	Total	570	153	49	45	12	829
	(%)	68,7	18,4	5,9	5,4	1,4	100
Others	Total	27	23	21	43	83	197
	(%)	13,7	11,6	10,6	21,8	42,1	100

Source: Considering information the 2006 PNDS.

[a] Oliveira et al. (2013) draw attention to the limitation that the religious frequency data may have arising from the likely underestimation of the interviewees in relation to questions about their church attendance.

more specifically in Brazil, there is evidence that the place of residence, whether urban or rural, as well as macro-regions, also interfere on religion frequency.

Among the controls already indicated in the literature, on the present study it was decided to test the hypothesis that the marital status of women, the fact of working or not, the current religion, and the fact of women who have gone through the trauma of death a son, may affect the frequency of religious cults. Therefore, we use a set of characteristics of Brazilian women of childbearing age (15–49 years) to estimate the religious demand (frequency). Table 3 shows the variables (demand shifters) and their descriptions.

2.2. Data descriptive analysis

Presented the source and description of the data, it is appropriate to analyze the descriptive statistics to expose some empirical evidence. Note in Table 4, that 53% of women interviewed work outside the household, which means that they are included in the labor market. Note that average labor income was R$518.74, while average income of the household in 2006 was R$1264.79.

With regard to demographics, it appears that 14% have less than 20 years (adolescent), while most of the sample consists of women aged 20–30 years (Adult 1), corresponding to 35% of respondents. Moreover, the corresponding clipping ages, Adult 2 and 3, show participation of almost 29% and 21%, respectively.

As for the self-declared ethnicity/race, the white correspond to 38% of the sample, revealing that non-white women have a higher participation in the sample.[8] Further note that 67.62% of the women considered in the sample were married or cohabiting.

Cultural aspects here considered also address the religious binding of the woman, as mentioned before, specifically the religion in which the woman was educated. It is observed that 81.84% of women were educated in the Catholic religion, however considering the Evangelical ones only 14.34% of respondents were educated in the evangelical religion. Regarding the experience of the death of a son or daughter, it was found that 8% of women have had at least one child who died.

Finally, in regard to the census areas, as expected, most of the respondents live in urban areas (72.6%). Being the Southeast region the one that concentrates the majority of the sample (21.08%). Note that different from other

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[8] Result similar to the one measured by the National Household Survey and the Census population, both national and conducted by IBGE representative.

Table 3
Description of variables.

Variables	Description of variables
Frequency to services or religious activities[a]	0 Never 1 Less than once per month 2 One to three times per month 3 Once a week 4 More than one time per week
Demographics	
White	1 if she said White, and 0 otherwise
Adult 1	1 if the woman is between 20 and 30 years, and 0 otherwise
Adult 2	1 if the woman is between 31 and 40, and 0 otherwise
Adult 3	1 if the woman is between 41 and 49, and 0 otherwise
Married	1 if the woman is married, and 0 otherwise
Socioeconomic	
Education	Years of study
Family income	Last month gross income, from the household
Work	Work away from home, last 12 months
Cultural	
Children that died	1 if a son or daughter died, 0 otherwise
Educated in no religion	1 if not educated in any religion, and 0 otherwise
Educated in the Catholic religion	1 if educated in the Catholic religion, 0 otherwise
Educated in the Evangelical religion	1 if educated in Traditional or Pentecostal Protestant, named Evangelical, and 0 otherwise
Currently Catholic	1 if said to be Catholic, and 0 otherwise
Currently Evangelical	1 if said to be Evangelical, and 0 otherwise
Currently has no religion	1 is said to have no religion, and 0 otherwise
Geographic	
Urban	1 if live in urban area, and 0 if he live in rural area
Southeast	1 if live in the Southeast, and 0 otherwise
South	1 if live in the South, and 0 otherwise
Midwest	1 if live in the Midwest, and 0 otherwise
Northeast	1 if live in the Northeast, and 0 otherwise
North	1 if live in the North, and 0 otherwise (reference category)

Source: Considering information the 2006 PNDS.
[a] Dependent variable.

household surveys conducted in the country, for example, National Sample Survey (PNAD) and Population Census, the South region has the second largest representation, concentrating a population of 20.73%, followed by the Midwest, Northeast and North with 20.42%, 19.21% and 18.56%, respectively.

3. Description of ordered models of discrete choice

To assess the determining factors of the frequency to services or religious activities in Brazil, we adopted an econometric model of discrete choice, since the dependent variable does not have a quantitative but a qualitative character.

In particular for the research carried out here, as already defined, there are exactly five possible answers, of qualitative character, concerning the demand for religious services in Brazil, which shows that the dependent variable has more than two categories, specifically distributed in an orderly manner.

According Long and Freese (2006) an ordered pattern in its most simplified version is the ordered pattern logit (or parallel lines), which assumes that the response of the dependent variable can take various levels explained by a set of independent controls defined according to theoretical statement. Whereas in that model, the dependent variable $y*$ is subdivided into J different ordinal categories, we have:

$$y = j \quad \text{if} \quad k_{j-1} \leq y < k_j \quad \text{to} \quad 1 \leq j < J \tag{1}$$

Table 4
Descriptive statistics[a].

Variable	Minimum	Maximum	Average	Standard deviation
Work outside the household	0,0	1,00	0,5353	0,49877
Household income	7,00	50.000,00	1264,79	1.869,12
Labor income	0,0	20.000,00	518,74	885,92
Adolescent	0,0	1,00	0,1434	0,35054
Adult 1	0,0	1,00	0,3554	0,47865
Adult 2	0,0	1,00	0,2895	0,45357
Adult 3	0,0	1,00	0,2116	0,40847
Years of study	0,0	12,00	7,9827	3,24954
Catholic religion education	0,0	1,00	0,8184	0,38549
Evangelical religion education	0,0	1,00	0,1454	0,35253
No religion education	0,0	1,00	0,0158	0,12454
Urban	0,0	1,00	0,7260	0,44601
North	0,0	1,00	0,1856	0,38878
Northeast	0,0	1,00	0,1921	0,39396
Southeast	0,0	1,00	0,2108	0,40786
South	0,0	1,00	0,2073	0,40541
Midwest	0,0	1,00	0,2042	0,40317
Married	0,0	1,00	0,6762	0,46794
Death of son	0,0	6,00	0,0806	0,34543

Source: Considering information the 2006 PNDS.
[a] The sample has 11.677 observations for all variables included except for labor income which has 7.949 observations.

The odds are linked to an array of explanatory variables, as explained in (2):

$$Pr(y = j|X) = Pr(k_j - 1 \le y^* < k_j|X) = F(k_j - X\beta) - F(k_{j-1} - X\beta) \tag{2}$$

It is noteworthy that the pattern of parallel lines, shows the distributional hypothesis that there is no individual difference between the ordinal J categories of the dependent variable, which refers to the value of β and Statistical significance. That is, the standard model assumes that the coefficients (β) keeps the same over existing category, this hypothesis is called Hypothesis of Parallel regressions for any ordered model. However, a problem with this proposal is that it invariably is violated, that is, commonly one or more of the β's differ, making the parallel lines model restricted.

Thus, the possibility of violation of the parallel regressions hypothesis, has two methodological possibilities, generalized ordinal model and the ordered model of partial proportional odds.

Regarding the general ordered model, it makes flexible the constancy of the coefficients from the equations, and can be written as:

$$P(Y_i > j) = \frac{\exp(\alpha_j + X_i\beta_j)}{1 + \{\exp(\alpha_j + X_i\beta_j)\}} \quad j = 2, \ldots, M - 1 \tag{3}$$

In practice, the generalized model has the difference of the hypothesis that the estimated β's are divergent for all *J* categories of the dependent variable. According Long and Freese (2006) and Williams (2006) the equations of the formulas of the parallel lines model and of the generalized ordered model are the same, except that in the parallel lines ordered logit, the β's match with the *j*'s, but not the α's.

The other option mentioned for the occurrence of violation of the hypothesis of parallel regressions is the ordered logit model of partial proportional odds. The model in question is a more parsimonious alternative between the two models already presented, being an intermediate model between the standard and the generalized models, as in this case, as Williams (2006) we have a partially restricted generalized ordered logit; when some β's are the same for all values of *j*, but others are free to vary. Putting into an equation we have:

$$P(Yi > j) = g(X\beta) = \frac{\exp(\alpha_j + X1_i\beta1 + X2_i\beta2 + X3_j\beta3_j)}{1 + [\exp(\alpha_j + X1_i\beta1 + X2_i\beta2 + X3_j\beta3_j)]}, \quad j = 1, 2, \ldots, M - 1 \tag{4}$$

To choose one of the three models to adopt, the Brant test (1990)[9] was used as a criterion and indicated the ordered logit model of partial proportional odds as the most appropriate (see Table 6). Therefore, the ordered model used in this research will estimate the coefficients and the marginal effects of the frequency measure to services or religious activities in Brazil, using socioeconomic, demographic and cultural indicators.

4. Analysis and discussion of estimated results

This study aims to identify the determinants of religious frequency of women in Brazil. For this, an ordered logit model of partial proportional probability is estimated and the results are reported in Table 5.[10] It should be noted that the table reports the estimation of two models. In one of them it is considered the religion in which the woman was educated (Catholic, Evangelical and none), while the other includes information about the current religion. The results analysis is derived from interpretation of the marginal effects.[11]

It is verified that cultural aspects influence the frequency to the activities or religious services. Specifically, the fact of having been educated in an evangelical religion increases the likelihood of attending church more than once a week at 10.03 percentage points (p.p). The results also show that being educated in evangelical precepts reduces the probability of a women never attend a church in about 6 percentage points.

Still referring to religious aspects, in the case of the Catholic religion, it is noted that the educated in the Catholic religion, are less likely to demand religious services more frequently. In fact, being educated in the Catholic religion reduces the likelihood of attending church more than once a week at about 11.27 p.p.

Finally, regarding the religious education, it is observed that a woman who never received encouragement in her education to attend churches, tend to not require this type of service in the future. Specifically, women who did not receive previous religious orientation, has a probability of 11.7 p.p of never attending religious services or activities.

Concerning the current religion it is noted that not having any religion increases the likelihood of women never go to church in 48.21 p.p, whereas being evangelical, reduces this probability by 11.25 percentage points, while being Catholic the probability reduction of never going to church is of only 1.57 p.p.

Also in relation to the declared religion during the survey, it appears that the Protestant (Evangelical) attend church more assiduously than the Catholic as the results show that being Evangelical increases in 17.64 p.p the probability of going to church more than once a week.

Among women who attend church more than once a week, being Catholic reduces this probability in 17 p.p. Moreover, it is observed that the Catholic women have a higher probability of going to church less than once per month (11.08 p.p), and one to three times per month (7.49 p.p).

In a study of religion and fertility among adolescents in Brazil, Verona and Dias Júnior (2012) also find that the Protestant women aged 15–24 years old attend church more assiduously than the Catholic.

Allusive to socioeconomic aspects, results show that the fact that women work (or have worked) in the last 12 months away from home has no relationship with her church attendance. The same applies to the household income.

The model that considers the religion in which the woman was educated, shows that higher household income levels are associated with a greater likelihood of women never require religious services. However, it is important to note that the effect of household income in church attendance is not the same for all frequencies. Considering that the relationship between household income and going to church at least once a week is positive, while going that going to church more than once week is less likely to happen, it can be said that in general the greater the household income, the probability is that the woman attend activities or religious services once a week.

The educational level has a positive correlation with religious frequency of Brazilian women, which is contrary to the study of Moreira-Almeida et al. (2010) for Brazil, and Halman and Draulans (2006) for European countries. However, it is observed that the effect is small, considering that the higher the educational level (years of schooling)

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[9] The statistical significance provides evidence that the parallel regression assumption was violated (Brant, 1990).

[10] The results of the standard and general models can be obtained from the authors.

[11] The estimated coefficients of models with discrete variables – including the logit and probit models – have a little intuitive interpretation. More consistent interpretable options are possible through the odds ratios or marginal effects. Anyway, the estimated coefficients are presented in Appendix – Table 7 for conference purposes.

Table 5
Estimates of the marginal effects for ordered logit of partial proportional odds.

Dependent variable: attendance to religious activities

Variables	Religion in which was educated					Current religion				
	Never	Less than once per month	One to three times per month	Once a week	More than once a week	Never	Less than once per month	One to three times per month	Once a week	More than once a week
Household income	3,34e−06	−1,72e−06	−3,78e−07	4,91e−06	−6,15e−06	9.52e−07	1.43e−06	2.07e−07	−1.35e−06	−1.25e−06
	(1,73)	(−0,60)	(−0,43)	(2,07)	(−2,88)	(1.04)	(1.04)	(1.03)	(−1.04)	(−1.04)
Years of schooling	−0,0052	−0,0033	−0,0016	0,0077	0,0025	−0.00488	−0.00364	−0.00167	0.009024	0.001178
	(−5,16)	(−2,45)	(−1,24)	(5,66)	(2,10)	(−5.42)	(−2.59)	(−1.22)	(6.07)	(1.14)
Catholic	−0,0989	0,0547	0,0651	0,0917	−0,1127	−0.01567	0.11075	0.074895	8.84e−05	−0.17006
	(−8,24)	(6,17)	(5,40)	(4,01)	(−4,67)	(−1.53)	(8.09)	(5.73)	(0.00)	(−10.47)
None	0,1170	−0,0656	−0,243	−0,0239	−0,0033	0.482144	0.075034	−0.13901	−0.27124	−0.14693
	(−8,24)	(−3,15)	(−1,22)	(−0,85)	(−0,11)	(16.67)	(5.02)	(−17.7)	(−37.45)	(−34.96)
Evangelical	−0,0596	−0,705	−0,0201	0,0499	0,1003	−0.11251	−0.13325	−0.01046	0.079789	0.176439
	(−10,06)	(−3,45)	(−0,51)	(6,82)	(4,98)	(−16.53)	(−9.76)	(−0.74)	(4.26)	(9.65)
Urban	0,3178	−0,0068	−0,0578	0,0015	0,0319	0.02538	0.007358	−0.05203	0.012418	0.006878
	(4,77)	(−0,94)	(−6,21)	(0,02)	(3,99)	(4.32)	(0.75)	(−5.2)	(1.16)	(0.92)
Northeast	0,0516	0,0503	0,0413	−0,0944	−0,0488	0.048319	0.051616	0.04506	−0.11561	−0.02939
	(4,75)	(4,34)	(4,88)	(−8,97)	(−4,74)	(5.08)	(4.1)	(4.14)	(−10.29)	(−3.72)
Southeast	0,0391	0,0359	0,0020	−0,0337	−0,0433	0.043308	0.057919	0.002722	−0.05723	−0.04672
	(4,70)	(6,01)	(1,78)	(−4,16)	(−3,60)	(6.91)	(7.87)	(2.79)	(−7.51)	(−8.38)
South	0,0445	0,0426	0,0980	−0,0873	−0,0977	0.04873	0.041325	0.099797	−0.11601	−0.07385
	(4,76)	(3,78)	(9,71)	(−7,85)	(−11,54)	(5.01)	(3.26)	(8.52)	(−9.93)	(−10.19)
Midwest	0,0347	0,0063	0,0020	−0,0300	−0,0390	0.025987	0.036442	0.003009	−0.03537	−0.03007
	(3,59)	(0,47)	(2,53)	(−3,05)	(−4,18)	(4.53)	(4.89)	(5.17)	(−4.74)	(−5.12)
Married	−0,0031	−0,0031	−0,0004	0,0027	0,0039	0.003416	0.005174	0.000772	−0.00485	−0.00451
	(−0,60)	(−0,60)	(−0,61)	(0,60)	(0,67)	(0.93)	(0.93)	(0.89)	(−0.93)	(−0.92)
Death of son	0,0060	0,0061	0,0008	−0,0053	−0,0080	0.008931	0.013455	0.001938	−0.01264	−0.01168
	(0,96)	(0,96)	(0,95)	(−0,96)	(−1,05)	(1.97)	(1.97)	(1.93)	(−1.97)	(−1.97)
Adult 1	0,0054	0,0054	0,0007	−0,0048	−0,0068	0.011661	0.017287	0.002246	−0.01637	−0.01482
	(0,77)	(0,77)	(0,80)	(−0,77)	(−0,85)	(2.19)	(2.23)	(2.4)	(−2.21)	(−2.26)
Adult 2	−0,0454	−0,0231	0,0085	0,0111	0,0400	−0.02577	−0.01809	0.025894	0.011164	0.006794
	(−5,85)	(−2,30)	(2,00)	(1,14)	(3,57)	(−3.76)	(−1.57)	(2.64)	(0.92)	(0.74)
Adult 3	−0,0714	−0,0648	0,0067	0,0303	0,0991	−0.04375	−0.06277	0.015594	0.037033	0.053893
	(−9,75)	(−6,13)	(0,63)	(2,76)	(7,30)	(−6.54)	(−5.36)	(1.42)	(2.84)	(4.8)
Work	0,0042	00,0043	0,0006	−0,0037	−0,0053	0.004102	0.006186	0.000899	−0.00581	−0.00538
	(1,04)	(1,03)	(1,02)	(−1,04)	(−1,07)	(1.28)	(1.28)	(1.26)	(−1.28)	(−1.28)
White	0,0129	−0,01930	0,0027	0,0153	−0,0117	0.01151	−0.02402	0.00369	0.016094	−0.00728
	(1,91)	(−2,23)	(0,46)	(1,71)	(−1,53)	(1.93)	(−2.61)	(0.41)	(1.63)	(−1.09)

Source: Prepared from estimated results.
Note: Statistical Z in brackets, for $N = 11{,}677$.

Table 6
Brant test for assumption of Parallel Regressions Parallel.

Variable	Prob $> \chi^2$
Variables with indication for ordered logit	
Married	0,9377
Death of son	0,5745
Work	0,4687
Adult 1	0,3578
Educated in Evangelical religion	0.3617
Southeast	0,1419
Variables with indication for generalized ordered logit	
Household income	0,0266
Years of schooling	0,0048
Educated in Catholic religion	0,0000
No religion education	0,0000
Urban	0,0000
Northeast	0,0000
South	0,0000
Midwest	0,0754
Adult 2	0,0037
Adult 3	0,0137
White	0,0068
Set of variables	χ^2 (48) = 1280,56 *Prob* $> \chi^2$ = 0.0000

Source: Authors from the results provided by the software used.

of the Brazilian woman, it is more likely that she attend church once a week, 0.9 p.p Also note that the higher the educational level, it is less likely that woman never go to church (12.49 p.p).

With regard to marital status of Brazilian women, one can say that the fact of being married or does not affect church attendance. Note that there is no statistical significance of the married variable with any level of frequency, in other words there is no consistent association between marital status and religiosity of Brazilian women. It is noteworthy that Moreira-Almeida et al. (2010) also did not observe any association.

Another feature that did not show any effect on frequency was the fact of having a son or daughter that died. This result does not corroborate the description of Morelli et al. (2013) for whom spirituality and religiosity are perceived as coping strategies to obtain comfort, relief from suffering and acceptance.

On the other hand, church attendance is more intense among women with at least 31 years old, especially and specifically for those older than 41 years old since for the respondents in the age group of 41–49 years the probability of never demand religious services is smaller, about 4.4 percentage points, in comparison to other women ages. Yet for this age group, it is observed that women interviewed of 40 years old and more increases likelihood of attending religious services more than once a week by 5.4 p.p.

People who declared to be non-white attend religious activities more than white people. However, this result occurs only among women who attend church less than once a month. This result is consistent with the hypothesis raised by Azzi and Ehrenberg (1975) model which explains differences in demands for religion, observed by color/race.

On geographical aspects, it is observed that residing in urban areas reduces the likelihood of women require more frequently religious activities or services. That is, a resident of urban areas has a higher probability of 2.5 p.p of never demanding religious services. Also, among women who attend one to three times per month, it turns out that those living in urban areas are less likely (5.2 p.p) in comparison to women residing in rural areas.

Also note that women who live in the Northeast, Southeast, South and Midwest are more likely to never go to church comparing to women of the North region of the country, and are less likely to attend more than once a week and also go once a week.

Therefore, the results of this study are in accordance with the stylized facts indicated by Azzi and Ehrenberg (1975). In fact, church attendance increases with age and is more intense among non-white and residents of rural areas. Besides that it was confirmed that schooling does not affect the frequency the activities or religious services. It can be said that the results presented here are in compliance with Narita and Anuatti (2004), Oliveira et al. (2013), among others.

Moreover, it is confirmed that women educated in Catholic and Evangelical religions (especially those educated in evangelical religions – Pentecostal or traditional Protestant), tend to go to church more frequently in adulthood. Thus, it can be said that the main determinant for religious frequency is the formation (education) that the woman have received in childhood.

5. Final considerations

To estimate the determinants of the frequency to services or religious activities in Brazil, we used the theoretical support of economics of religion, developed by Azzi and Ehrenberg (1975), and information from the National Demographic and Health of Children and Women (PNDS) 2006.

As for religion demand indicator, is employed a discrete variable with five different options for attending the services or religious activities, namely: (i) never; (ii) less than once per month; (iii) one to three times per month; (iv) once per week; and (v) more than once a week. To estimate this demand, the ordered logit model of partial proportional odds is employed.

From the descriptive analysis of the data, it is verified a "religious migration", especially from the women who were established in the Catholic religion to the Evangelical (traditional and Pentecostal). This follows from the fact that 81.8% of women were educated on Catholic principles, while 65% reported being Catholic at the time of the research. Yet, among evangelical it is observed a growth of more than 8 percentage points since 14.6% said they had been educated in evangelical religion and 22.7% said they are currently evangelical. Note that these percentages are equivalent to the Moreira-Almeida's research (2010) on religious involvement and sociodemographic factors, which from a random sample of Brazilian population ($n = 3007$) found that the most common religious affiliations were Catholic (68%) and Protestant/Evangelical (23%).

Regarding the econometric results, it can be said that the socioeconomic and demographic characteristics of women affect the frequency of religious practices in Brazil. However, the main feature on the demand for religious activities or services is related to the religion in which the women was educated, if Catholic or Evangelical (considering Protestant religions: Traditional and Pentecostal). However, it is noteworthy that among those educated in evangelical religions, there is a greater likelihood of church attendance more than once a week.

In relation to household income, the results do not provide evidence on the relationship between income and church attendance. On the other hand, still considering socioeconomic aspects, it appears that the higher the education level, the less likely the woman never go to church, and also the greater the chance of going once a week.

Regarding demographic characteristics, those self declared white are more likely to never demand activities or religious services, vis-à-vis women of other colors/races. In relation to age, it can be seen that the greater the age, the higher the chance of having greater religious attendance. These findings corroborate the evidence of Azzi and Ehrenberg (1975).

Therefore, in general, evaluations of this research show a profile of demanding women for activities or religious services, composed of non-white and that received religious education (Catholic and Evangelical) in childhood and/or adolescence. In addition, it is noteworthy that no evidence of impact was found in relation to marital status and the fact of having experienced a death of a son or daughter on the frequency of religious activities.

Appendix A.

Table 7
Ordered Logit of partial proportional odds – frequency to religious activities – (Base category = attend church more than once a week).

Variables	Never	Less than once per month	One to three times per month	One time per week
Household income	−0,00002	−7,32e−06	−3,82e−06	−0,00004
	(−1,73)	(−0,65)	(−0,35)	(−2,88)
Years of Schooling	0,04794	0,0379	0,04193	0,0173
	(5,14)	(5,63)	(6,37)	(2,10)
Educated in Catholic	1,0898	0,26117	−0,07609	−0,6015
religion	(10,04)	(2,61)	(−0,76)	(−5,18)

Table 7 (*Continued*)

Variables	Never	Less than once per month	One to three times per month	One time per week
No religion education	−0,7823	−0,2171	−0,1109	−0,0229
	(−4,09)	(−1,16)	(−0,59)	(−0,11)
Educated in	0,9623	0,6683	0,6058	0,6978
Evangelical religion	(7,75)	(6,02)	(5,54)	(5,66)
Urban	−0,2994	−0,1049	0,1306	0,2293
	(−4,52)	(−2,27)	(2,88)	(3,85)
Northeast	−0,4781	−0,3971	−0,6316	−0,3325
	(−5,23)	(−6,25)	(−10,19)	(−4,42)
Southeast	−0,4630	−0,2811	−0,3506	−0,2467
	(−5,14)	(−4,48)	(−5,84)	(−3,43)
South	−0,4707	−0,3174	−0,8081	−0,7816
	(−5,21)	(−5,03)	(−13,10)	(−9,74)
Midwest	−0,3550	−0,2144	−0,3191	−0,2879
	(−3,86)	(−3,38)	(−5,28)	(−3,94)
Married	0,0238	0,0238	0,0238	0,0238
	(0,60)	(0,60)	(0,60)	(0,60)
Death of son	−0,0073	−0,0073	0,0076	−0,0073
	(−0,96)	(−0,96)	(0,337)	(−0,96)
Adult 1	−0,0425	−0,0425	−0,0425	−0,0425
	(−0,77)	(−0,77)	(−0,77)	(−0,77)
Adult 2	0,4243	0,3047	0,2106	0,2661
	(5,46)	(4,80)	(3,35)	(3,69)
Adult 3	0,7290	0,6240	0,5224	0,60181
	(8,23)	(9,16)	(7,93)	(8,00)
Work	−0,0356	−0,035	−0,0356	−0,0356
	(−1,03)	(−1,03)	(−1,03)	(−1,03)
White	−0,09961	0,03036	0,01372	−0,08279
	(−1,72)	(0,70)	(0,33)	(−1,56)
Constant	0,8180	0,0762	−0,4165	−1,2469
	(5,24)	(0,58)	(−3,22)	(−8,21)

Source: Prepared from the results estimated with the software.
Note: Statistical Z in brackets, for $N = 11,696$.

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