Ora et non labora?
A test of the impact of religion on female labor supply

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Abstract[#]:This study examines the influence of religion on women's decision to enter the labor market using data from the European Values Study (EVS) relative to 47 European countries. We use a logit framework and analyse women aged between 18 and 60 years. The results show that women belonging to the Catholic, Orthodox and, even more, Muslim denomination present a higher risk of non-employment than the agnostics, while being a Protestant increases the probability for a woman to be employed. Although its intensity is slightly weakening, the association between religious affiliation and female labor supply is robust to different sets of controls, such as a number of individual and demographic characteristics as well as welfare regimes and national specificities. The findings are robust also when we control for endogeneity of the religious affiliation and find that the impact of religion is stronger on the probability of participating in the labour market, rather than on the probability of finding a job. .

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Introduction

Economists are generally reluctant to admit the influence of cultural, and, more specifically, religious beliefs on the economic behavior of individuals. This moves away economists from the common way of reasoning and also from the common sense, while bringing their theories at odds with the orthodoxy of other social sciences and also the facts of real life. A large anecdotal evidence suggests that the female behavior in life and specifically in the labor market is dramatically affected by their religious beliefs, by the religious beliefs of their parents and their husbands. On the one hand, a common accusations of EU citizens on immigrants, for instance, or on the countries belonging to the neighboring region of North Africa, is that their religion might be seen as an obstacle on the way to integration with the EU and to the path that should lead to democracy. The attitude of the Muslim religion against women is often mentioned as evidence of this. On the other hand, women in the Nordic Protestant countries often seem to believe that their pairs in the Southern and Orthodox countries are impeded to work by their religious beliefs.

Is there statistical evidence to support these claims? On the one hand, we find an astonishingly neat negative association between the share of individuals belonging to the catholic (and orthodox) religion in the population of European countries and that of active women in the labor market. Is this relationship robust to controls for individual and environmental heterogeneity?

This study examines the influence of religion on women's decision to enter the labor market in a cross-country dimension by using data from the European Values Study (EVS) relative to 47 European countries. We use a logit framework and analyse women aged between 18 and 60 years. The results show that women belonging to the Catholic, Orthodox and, even more, Muslim denomination present a higher risk of non-employment than the agnostics, while being a Protestant increases the probability for a woman to be employed. Although its intensity is slightly weakening, the association between religious affiliation and female labour supply is robust to different sets of controls, such as a number of individual and demographic characteristics as well as welfare regimes and national specificities. The findings are robust also when we control for endogeneity of the religious affiliation and find that the impact of religion is stronger on the probability of participating in the labour market, rather than on the probability of finding a job.

The main novelties of this paper are as follow. This is the first study to employ the European Values Study (EVS since now) data relative to 47 European countries, which makes us possible to test if previous analysis related to a single nation (Heineck 2004, Maneschiold and Haraldsonn 2007), can be extended to a wider sample. The specific nature of the countries considered, which is homogeneous from a geographical, historical and political point of view, allows us to control for different institutional, cultural and religious characteristics in a way that has not been possible earlier. A large literature suggests that European countries belong to several well identified macro clusters which should allow reducing the degree of

heterogeneity in the data, therefore contributing to identify in a way that has not been possible earlier the actual impact of different religious affiliations on the probability of women to participate to the labor market.

The outline of this paper is as follows. Section one motivates the paper by showing the starting hypothesis of it and by discussing its policy relevance. Section two surveys the existing literature on the link between religious beliefs and female labor market participation. Section three discusses the methodology adopted in this study. Section four discusses several features of the data used to carry out the econometric analysis. Section five presents the results of the econometric analysis. Some concluding remarks follow.

1. Motivation

In all EU27 countries, there is a gender gap in employment rates, with the only exception of Latvia and Lithuania where gender differences are irrelevant. The EU27 average female to male employment ratio equals 83% in 2010, as based on Eurostat data. Only in Denmark, Finland and Sweden the ratio between female and male employment rate is between 90% and 98.5%. Thirteen out of twenty-seven nations show female employment rates that are lower than male employment rates by between 10 and 20 percentage points. There is also a group of Mediterranean countries where the difference between the two rates is much higher, reaching 48% in the case of Malta and 32% in the case of Italy and Greece.

Apparently related to this evidence is that relative to the share of individuals that declare to belong to the Catholic and Orthodox (in the case of Romania, Bulgaria, Cyprus, Estonia and Greece) denominations, as they result from the questions asked in the European Values Survey. Figure 1 shows how in countries with higher Catholic or Orthodox presence there is less participation of women in the labor market. Italy, Greece, Poland, Romania and Hungary are part of this group. By contrast, in countries with shares of Catholics lower than 40%, the female participation rates reach values between 65% and 75% (Denmark, United Kingdom, Finland and Sweden).

[Figure 1 about here]

Obviously, religion is just one among many factors that influence women's participation in the labor market, and it cannot be hence satisfactory to run a descriptive analysis. High rates of female participation of Northern Europe Catholic countries, like Austria for example, are mainly due to different welfare state traditions that result in policies promoting women's participation rate. It's worth noting that in many countries work gives access to a range of social rights that people would otherwise lose, such as welfare and health rights. However, the negative relationship between religious denominations and female participation rates is so clear and strong that we naturally wonder if the statistical association reveals the possible existence of a causal link between the phenomena of female labor market participation and belonging to one or another denomination. Our goal is to carry out a cross-country analysis in which

religion explains the low participation rates of women in the labor market. We also ask ourselves if, in addition to the policy factors, also cultural and religious specificities of a nation are able to explain not only the low female participation in the labor market. By influencing individual attitudes and behaviors, culture and religions necessarily have a role in the formation of women's career choices. Undoubtedly, the entry of women into the labor market depends on men' attitude towards female work. Such men's attitude has an effect on decisions that are taken within families. In this sense, male religious values have a role in determining the female participation rate.

We base our hypothesis on the division of roles proposed by the social Catholic doctrine. In the Apostolic Letter *Mulieris Dignitatem* the Catholic doctrine reaffirms full equality between men and women within marriage. However, women are considered to be the most suitable to the roles of care and reproduction activities which must take precedence over other forms of employment. Pope John Paul II was one of the strongest supporters of this argument, pointing out to the specific "feminine genius" in performing caring roles.

If these are the premises, one may wonder whether a significant percentage of women, that were educated on the basis of these values, can reject the idea of seeking work, not to mention the ambition to be business leaders or politicians.

Moreover, even if the reflection proposed by Guiso et al. (2002)   "…religious teaching do not necessarily reflect the authentic message contained in the sacred texts. They simply represent the way certain religion beliefs became crystallized over time…" is reasonable, the effect on women economic decision to enter the labor market is always detrimental.

Last but not least, we aim to understand whether the catholic believes have a greater or smaller impact than other religious believes. To such an end, we compare individuals belonging to different denominations.

The present study aims to add to the existing literature in several important ways. First, while several recent studies have been focusing on the role of religion on several aspects of economic life , this is the first paper to study the impact of religion on female labor market participation. Second, this paper attempts to test the causality relationship between religious attitudes and female labor market participation, by using different econometric methods.

2. The state of the art

The recent literature, and not just the economic one, is investigating on the relationship between female participation rates and cultural and religious values.

Several studies show how different cultures and institutional structures differently affect the formation of individual attitudes and behaviors. Inglehart and Norris (2003), for example, argue that the process of modernization has produced increasing gender equality. In particular the shift from agricultural societies, which reflect traditional values, to post-industrial societies has generated more egalitarian attitudes. According to the authors, during the modernization process, it is not income anymore to ensure gender equality, but the cultural change and the adaptation of religious values. Another important factor is represented by the role of the state through the promotion of women's agency and social rights. Heather Antecol (2003) analyzes the determinants of female participation rates in Europe, Middle East, Asia, Oceania and North America, using the International Social Survey Program (ISSP) dataset. Cultural aspects are taken into account through proxies that measure men's attitude towards family and the distribution of gender roles. The results show that it is more likely that women enter in the labor market when their partners agree with their choice.

Fernández and Fogli (2006) investigated the influence of culture on married women's work behavior, using a sample of women born in the US but whose parents were born elsewhere. They found a positive and significant effect of cultural factors on women's work behavior even after controlling for individual and spousal characteristics. Fernández (2007) confirms similar results by employing future labor force participation rates, given that culture varies very slowly over time.

In a work about Chile, where there is a rooted Catholic traditions, Contreras and Plaza (2010) tested the hypothesis that in the short term cultural attitudes influence women's participation rate. In particular, more conservative women participate less to the labor market.

It is worth underlining that in this type of analysis there is a problem of causality direction, so that the results presented by the authors have a value of short-term effect or just association between variables. If on the one hand it is possible that cultural attitudes determine female participation in the labor market, on the other hand it is well plausible also that women's participation in the labor market influence their cultural norms.

Stephanie Seguino (2007) shows that the entry of women into the labor market has produced an effect on social norms and stereotypes, albeit with a lag of five years. This time is necessary for women in order to perceive a change in their status.

Another difficulty of these studies is trying to separate out cultural and religious values. However, there are some works that analyze the effects religions produces on women's decision to enter in the labor market. Esping-Andersen (1990) analyses how religious denominations are likely to influence the employment patterns by shaping the subjective values. He classifies nations into social-democratic, liberal and conservative-corporatist countries and associates the latter with the Catholic countries in Continental and Mediterranean Europe. His conclusion is that conservative-corporatism promote the male breadwinner

conception by implementing welfare and family rights detrimental to women labor market participation. However Esping-Andersen does not provide quantitative evidence.

Some recent microeconomic works have focused on the influence exerted by religion on several individuals life aspects and not least on the economic and social choices such as the participation to the labor market. These studies argue that the formal religious institutions exert a strong influence, through the definition of social norms and behaviors, on the distinction between male and female roles (Inglehart and Norris, 2003).

Guiso et al. (2002) use three waves of the World Values Survey (1981-4, 1990-3 and 1995-7). Respondents come from 66 independent countries. These countries include almost 80 percent of the world's population. The authors focus on questions that might influence women's propensity to work. Hence, their dependent variables are represented by responses to a variety of questions ranging from : 1) who should get a job first, a man or a woman, when jobs are scarce; 2) whether men should have priority in obtaining university education; 3) whether both men and women should contribute to household income. They run OLS regressions analysis controlling for demographic characteristics (health, male, age, education, social class, income), some indicators of religiosity. They get that the lower tolerance of individuals most involved in religious activities towards women's work is not specific attribute of Catholicism or Islam, but is widespread across many religions, including Protestantism. This result would seem to comfort the conclusions reached by Knudsen and Waerness (1999), who claim that women's participation in the labor market is rather the consequence of the secularization process, which has led to different attitudes and behaviors in Western industrialized countries. In particular, two major components of this process would be represented by the struggle for gender equality and the process of women personal growth. In a later work, Knudsen and Waerness (2001) construct an indicator that summarizes the attitude towards gender roles and mothers' work using ISSP data. The result obtained is that people who attend religious places with more diligence and study the doctrine show a less liberal attitude. The work of Sjoberg (2004) confirms this result: individuals with less liberal attitudes are those who more frequently attend religious services and study the doctrine. The author uses multilevel regression techniques on data from the 1994 International Social Survey Programme (ISSP) module 'Family and Changing Gender Roles II', relative to 13 industrialized countries. Dependent variable in the estimated models is the "Attitudes towards female labour force participation Index", that includes five items on which respondents have been asked to indicate their degree of agreement or disagreement: 1) 'A preschool child is likely to suffer if his or her mother works.'2) 'All in all, family life suffers when the woman has a full-time job.'3) 'Being a housewife is just as fulfilling as working for pay. 4) 'A man's job is to earn money; a women's job is to look after the home and family.' 5) 'It is not good if the man stays at home and cares for the children and the woman goes out to work.' Dependent variables are sex, age, level of education, religiosity combined with religious belonging. these variables have the expected sign: women have a significantly higher coefficient than men;

level of educational attainment has a significantly positive effect; and age has a significantly negative effect. With respect to religious variables, What matters more is the attendance rather than the belonging to a religious denomination. H'madoun (2010) presents an empirical analysis of the influence of religiosity on women's decision to enter the labor market. The author employs the 2005 wave of the World Value Survey to check whether the decision of women aged 18 to 55 to work is influenced by individual religiosity. H'madoun estimates a a labor force participation equation by employing a probit technique, given that the dependent variable takes value 1 if individuals are in full-time, part-time or self-employment, and 0 for other conditions. In addition to usual dependent variables (age, education, marital status, health and children), the author introduces religious variables such as religious affiliation, intensity of belief and participation in religious services. The analysis confirm the hypothesis of a significant difference between religious and non-religious women's decisions to enter in the labor market: religious women enter less than non-religious women to the labor market. Taking as reference category nonaffiliated women, almost all religious affiliations had a negative impact on female participation. Moreover, as individual's intensity of beliefs increases, the likelihood of employment decreases, confirming that what matters more is religiosity with respect to religious affiliation (Iannacone 1992).

Heinek (2004) analyses decisions of married women to divide their time between the participation in the labor market and the other non-market activities. The author (2004) uses data drawn from the German Socio-Economic Panel (GSOEP), providing information on all household members. A multinomial logit model is estimated by the author, where the dependent variable is the employment status of married women in Germany in 1997 (full-time employment, part-time employment, not employed), while the independent variables are age, years of education, children up to age 6 and children aged 7 up to 16, health status, religious affiliation combined with religiosity level, residence's municipal size. The main result is that married women's decisions are influenced by both the role division prescribed by their religion and their level of religiosity. The same result is obtained by Maneschiold and Haraldsson (2007), who uses data drawn from the Swedish Level of living Survey (LNU), selecting only married women. They use a mmultinomial logit framework, where the dependent variable is represented by employment status of married women, while controlling for family and individual background (age, education, age of children, health, main responsibility for the household, size of the city where the women is living) and the importance women attach to a faith who is very strict towards female labor participation. The authors find that married women who belong to a religious denomination very strict towards female work tend to participate less in the labor market with respect to married women who are less strict in their religious convictions.

Some analysis focus on the differences between the various religious denominations and the results are not homogeneous: while the work of Gomilshack et al (2000) show greater aversion to the work of Catholic women, Sjoberg (2004) argues that the Catholic and Protestant doctrines in part share the same

vision of the traditional roles in family. This can be explained thanks to the political institutionalization of religious values and traditions within the party system in some Protestant countries such as Norway and the United States. Catholicism, however, paid particular attention in teaching women's care obligations, producing more influence on a traditional roles distribution.

Another aspect considered in the literature is the influence religions have on the development of laws and national institutions (Algan and Gauch, 2004). If in a nation there is a widespread idea that man is the family breadwinner, probably the policies will reflect this concept. We have also to remember that Italy is among the countries in which family is the main provider of welfare services and in which the emancipation of the family members takes place "within" the family rather than "from" the family (Bettio and Villa, 1998). Women have to take care of their children, parents and the disabled family member during all their life cycle. Policies that encourage the creation of a market for occupations related to care services (such as in-kind services or tied cash transfers) would undoubtedly produce positive effects on women labor market participation.

3. Methodology

The aim of this paper is to understand the religious influence on women's decision to enter the labor market, controlling for a number of socio-demographic and cultural factors. In particular, the hypothesis we want to test is the following: according to the Catholic religion women are particularly good in performing care activities. Therefore, they must give priority to work within, rather than outside the family. The consequence of this division of roles is that women educated on the basis of these values may reject the idea of entering the labor market, not to mention the ambition of being managers or leaders of political parties.

To assess the effect of religion vis-à-vis other demographic, cultural and policy factors on a woman' decision to enter the labor market we estimate the following labor force participation equation:

$$FP_i = \beta_0 + \sum_{i=1}^{n} \beta_i X_i + \sum_{j=1}^{8} \gamma_j R_j + \sum_{m=1}^{9} \delta_m D_m + \varepsilon_i \tag{1}$$

In the simplest specification, the dependent variables is a binary choice outcome:

$$FP_i = \begin{cases} 1 & \text{if the woman is employed} \\ 0 & \text{otherwise} \end{cases} \tag{2}$$

where FP_i is the ith individual's employment status. Notice that in this simplest specification, we group in non-employment all the unemployed and the inactive. We aim to estimate the following probability:

$$\Pr\left(FP = 1 \middle| \sum_{i=1}^{n} X_i + \sum_{j=1}^{8} R_j + \sum_{m=1}^{9} D_m\right) = \frac{e^{\beta_0 + \sum_{i=1}^{n} \beta_i X_i + \sum_{j=1}^{8} \gamma_j R_j + \sum_{m=1}^{9} \delta_m D_m}}{1 + e^{\beta_0 + \sum_{i=1}^{n} \beta_i X_i + \sum_{j=1}^{8} \gamma_j R_j + \sum_{m=1}^{9} \delta_m D_m}} \tag{3}$$

where *FP$_i$* is the employment status of the woman *i*. X$_i$ is a vector of socio-demographic variables that influence labor supply, such as age, education, marital status, number of children, presence of first child under the age of 10 years, presence of parents and grandparents in the household, poverty condition of the family, nationality, parents' and partner nationality, years of immigration. The religious exogenous variables are included in *R$_i$*, while *D$_i$* is the vector describing the welfare state regimes of each country. As better detailed in the data section and in Table A1 in the Appendix, the data allow distinguishing 9 religious denominations, which have been grouped in 6 because of the small cells relative to some denominations (Jewish, Hindu, Buddhists and others), plus the agnostics and the atheists. The components of vector D are 9 dummy variables, each one representing a group of homogeneous countries for the welfare state organization and management. The dependent variable is dichotomous and is hence estimated by a LOGIT:

$$\text{Logit}\Big(E\big[FP_i\big|x_{1,i},\ldots\ldots x_{m,i}\big]\Big)= \text{Logit}\left(p\right)_i = \ln\left(\frac{p_i}{1-p_i}\right)$$

(4)

As already mentioned, in addition to using a dichotomous variable employed/not employed (*FP$_i$*), we use also another way of catching female participation, that is a categorical variable represented by the categories: employed (30 hours a week or more; less than 30 hours a week; self-employed); inactive (housewife not otherwise employed; student); unemployed. For the latter, multiple discrete outcomes model, we observe the following choices:

(5)

$$Y_i = \begin{cases} 1 \;\; employed \\ 2\, unemployed \\ 3 \;\; inactive \end{cases}$$

Where *Y$_i$* is always the ith individual's employment status, and the estimated probability model can be stated as:

(5)

$$\Pr\left(y_i = m\big|x_i\right)= \frac{\exp\!\left(x_i\beta_m\right)}{\sum\limits_{j=1}^{J}\exp\!\left(x_i\beta_i\right)} \quad \text{with m=1, 2, 3, and j=1,.....m.}$$

4. Data

Our empirical analysis is based on the EVS, a large-scale, cross-national and longitudinal dataset on basic human values. It provides insights into the ideas, beliefs, preferences, attitudes, values and opinions

of European citizens. The available variables are related to the following dimensions of life: Perceptions of Life; Politics and Society; Work; Religion and Morale; Family; National Identity; Environment; Life experiences; Respondent's parents; Respondent's partner Socio Demographics Characteristics[1]. We use the fourth wave of 2008 that covers no less than 47 European countries/regions. The sample is composed by almost 68000 individuals, of which 36800 are women.

Our sample is represented by women aged between 18 and 60 years. The question corresponding to the female labor force participation variable (employed_notemployed) is the following one: "Are you yourself employed or not?". We codify it as a dichotomous variable that takes value 1 if the interviewed is employed, and value 0 if not employed. The same dependent variable is used in the works of Read (2004) and H'madoun (2010).

The explanatory variables included in the equations are: age, age squared, level of education, current civil status of, parents living in the household, grandparents living in the households, household poverty measured through poverty thresholds, number of children, presence of first child under ten years, religious belonging , frequency of religious service attendance.

Age and age squared, calculated by using the year of birth of respondent, tests for the existence of a U-shaped effect. The level of education is represented by three dummy variables, and the expected effect is that of higher level of participation for women who have higher level of education. With respect to the variable legal status, when controlling for women legal status it is possible to understand the different women's behaviour when they have to allocate their time among home domestic production, work outside the family and leisure time. Moreover it is possible to understand the influence of the roles' division and the influence of the husband when women live in a household.

We then consider the variables "presence of parents" and "of grandparents" in the household as regressors. Expected coefficients are not unambiguous, because parents and grandparents that live in the household may have a double effect on female labor force participation: if they are in good health, they can help with both children care and household management, facilitating the work of women. On the contrary, if they are not in good health and need assistance themselves, women may decide not to enter (or not to re-enter after giving birth) the labor market to carry out care activities within the household. Since in our data it is not possible to assess the health status of parents and grandparents, the relation between the presence of parents and grandparents in the household and women' s labor force participation cannot be predicted *a priori*.

Another important factor able to affect a woman' decision to enter the labor market is represented by the presence of children in the household and, in particular, the presence of a first child under the age of 10 years.

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[1]   For a description of all the available variables, see: http://zacat.gesis.org/webview/index.jsp?object=http://zacat.gesis.org/obj/fCatalog/Catalog5.

The variable poverty threshold (poors_Az1) is a dichotomous variable that equals 1 if the households' income is lower than the poverty threshold, and equals 0 when it is higher.

With respect to religion, as said before we consider different variables: i) religious belonging; ii) religiosity, represented by the frequency of religious service attendance. As noted before, religions can influence women's decision to work through the provision of a specific division of gender roles, where women are the ones with primary responsibility for care activities related to the care of children and the family (Fortin, 2005; Guiso et al., 2003). Other than the religious affiliation, an important aspect is represented by the religious capital accumulated through the attendance of religious services. The more respondents are involved in religious activities, the more they are exposed to religious precepts (Heinek 2004), the higher is the influence of religious doctrines on their preferences and decisions in life.

Finally, in order to control for different regimes of welfare state, we divided the 47 nations included in the EVS databank in eight groups, following the definition given by Simonazzi (2008): Scandinavian, Mediterranean, Central European, Anglo-Saxon, East European, which have been further divided in countries that entered the EU in 2004 and countries that entered the EU after 2004, former-Yugoslavian, former soviet, and Turkey and North Cyprus. H'madoun (2010) underlines how the introduction of country dummies determines an underestimation of religion's effect given that such an effect is captured by the national culture. The hypothesis under consideration is exactly that there is some specificity attached to religious beliefs that persists also after controlling for other individual, environmental and cultural factors.

Finally, we control for the nationality of the interviewee, and the number of years she has been living in the country where she is currently residing. A dummy that captures whether at least one parent, or both, are foreigners is included in the estimates to control for the parents' nationality. A dummy variable to describe the nationality of the spouse or partner, that we think can influence the decision of women to enter the labor market, is also included in the estimates as a further control.

5. Results

5.1. Descriptive statistics

Before proceeding with the multivariate analysis, we present some features of female respondents present in the 8th wave of EVS. Table 1 reports the means and the standard deviations of all the variables used in our regression analysis for the sample of women aged between 18 and 60 years (n=25131).

First of all, we need to comment on the dependent variables.

About 53% of the women considered are married or cohabitating, while 47% are divorced, separated, widowed or single. Half of women have a maximum of two children, while 98% have a maximum of 4 children. About 32% of women have no children. Looking at the relation between number of children and

women occupational status (employed /not employed), the transition from having two to three children leads to a reduction of 68% of employed women. Moreover, only when children reach the age of 7 years the number of employed women returns to be higher than that of the women who not employed.

Women who have the first child under the age of 10 years are about 17%, and if we consider the relation between the occupational status and the presence of the first child under 10 years, women who work with young children are approximately 1500, against 13.300 who are employed but do not have their first child under 10 years.

19% of respondents are co-resident with their parents, while only 3% are co-resident with grandparents.

With respect to the economic conditions, the data shows that about 41% of women are under the poverty line.

About 96% of the sample has completed compulsory education, against a share as high as about 84% of those who have completed high secondary school and as 23% of those who have completed tertiary education. Among those women who have completed compulsory education, the employed are a small number than the non-employed. Conversely, among women with a higher educational level, and in particular those holding a university degree, the share of employed ones is greater than that of the non-employed women (about 3% in the former case and double that share in the latter case).

[Table 1 about here]

5.2. The determinants of female participation

Table 2 presents results of different LOGIT models of the determinants of *FPi*, as based on equation [1]. We start from introducing only demographic and individual control variables (Model A); then we introduce the religious variables (Model B); and finally we control for different welfare regimes as well as for per-capita social expenditure (Model C), to see whether the impact of religious beliefs on female participation is influenced by the type of welfare regime adopted in the country. For ease of interpretation, the table reports odds ratio of the independent variables[2], rather than estimated coefficients.

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[2] The odds ratio is the ratio of the odds of an event occurring in one group to the odds of it occurring in another group. The term is also used to refer to sample-based estimates of this ratio. These groups might be men and women, an experimental group and a control group, or any other dichotomous classification. If the probabilities of the event in each of the groups are p_1 (first group) and p_2 (second group), then the odds ratio is:

$$\frac{p_1/(1-p_1)}{p_2/(1-p_2)} = \frac{p_1/q_1}{p_2/q_2} = \frac{p_1 q_2}{p_2 q_1},$$

where $q_x = 1 - p_x$. An odds ratio of 1 indicates that the condition or event under study is equally likely to occur in both groups. An odds ratio greater than 1 indicates that the condition or event is more likely to occur in the first group. And an odds ratio less than 1 indicates that the condition or event is less likely to occur in the first group.

Turning first to the results of Model A, the probability of female participation in the labor market increases with age, but the effect is concave, since the squared term is negative and statistically significant. It means that the probability of being employed reduces the closer women get to the retirement age. The estimates confirm the typical inversely U-shaped pattern commonly found also in other empirical papers (Lehrer 1995, HeinecK 2004).

Women who have completed compulsory school are more likely to be employed with respect to women who have only pre-primary education or no education, and this probability increases with the level of education increasing. Interestingly, the impact of education on the employment chances of women is higher for those women who have attained high secondary education rather than those who have attained tertiary education. Nonetheless, once controlling for religious beliefs and welfare policy variables, the probability to find employment increases monotonically with education, which suggests that the result in Model A might be the consequence of a composition effect.

An increasing number of children reduces the probability of finding employment, and this is especially the case when the first child is younger than 10 years.

Being married or in a registered partnership reduces the probability to be employed, while having parents living in the households increases the employment probability of women. This may be due to the help women receive from their parents, especially when children are very young.

Turning to the economic conditions, women who are under the poverty threshold present a higher risk to be unemployed than women who are above the poverty threshold. This can be explained given the deprivation condition that features individuals living under poverty thresholds, not only in terms of income and consumption, but also in terms of social relationships, lower levels of education, financial exclusion etc. All these factors make it hard looking for a job and, even more so, finding a job.

These results are confirmed for all regressions in Table 2. Model B includes also controls for religious affiliation and the odds ratios seem to confirm some of the theoretical expectations. Women belonging to the Catholic, Orthodox and, even more, Muslim denomination present a higher risk of non-employment than the agnostics, while, interestingly, being a Protestant increases the probability for a woman to be employed. The women who belong to other denominations (Jew, Buddhist, Hindu, others) have the same employment chances as the baseline group of the agnostics, maybe because of the small number of observations available.

More specifically, Catholic women have about 13% lower chances of finding employment than an agnostic woman. The comparable figure is 40% less for the Orthodox women and about 68% less for Muslim women. Protestant women have about 60% more chances of employment than agnostic women.

Finally, Model C incorporates several variables for the different welfare regimes of European countries, in order to capture institutional characteristics that may influence women' decision to work. Also the per-capita social expenditures has been introduced in order to quantify the possible impact on female decisions of the social services supplied in each country. Nonetheless, in this specification of the model this variable is not statistically significant. Taking into account welfare regimes variables does not change the results about religious affiliation: Catholics, Orthodox and Muslims present a higher than average risk to be unemployed with respect to the agnostics, while for Protestant women there is always a higher probability to be employed. The only difference is in the intensity of the association, which is slightly lower in this specification of the model.

[Table 2 about here]

The greatest effect of policy regimes variables is found in the case of Muslim women whose chances of finding a job are double those without controls: considering the impact of policy variables the probability of a Muslim woman to find employment reduces to just 34% less than average. For the Orthodox women, the effect is reduced to about 32%. For Catholic women, there is only a small impact. The effect of belonging to the Protestant religion is reduced down to 22% and loses much in statistical significance.

Overall, these findings confirm those of previous research according to which the impact of religious denominations on female participation is robust to the inclusion of controls for national specificities and different welfare regimes, although the religious influence on the labor market behavior of women seems to reduce as a consequence of controlling for other national and cultural specificities. The reduction of the impact is greater the greater is the original impact and therefore in the case of Muslim, Orthodox and Protestant women.

Table 3 focuses on the effect of active religiosity on female labor force participation. For each religious affiliation we consider two groups of individuals: the religiously active and the non-active, which is measured with respect to the intensity of religious services attendance. Comparison of model C of Table 2 and of the model presented in Table 3 shows that for some religious denominations the overall impact of religion on female participation is, in fact, essentially due to those individuals who live actively their religiosity. This is especially the case of the catholic women, whose non-employment risk is statistically lower than average, by 33%. This is not the case of catholic women who do not live actively their religion: the latter have the same employment chances as the baseline group of agnostic women.

Differences among active and non-active women can be found also for other religious denominations, though such differences are less marked and of different nature. Muslim and orthodox women are confirmed to have a higher than average risk to be unemployed, and a higher level of religiosity increases

even more the risk to stay out of the labor market. In the case of Protestant women, living actively their religiosity tends to reduce the employment chances in the sense that only the non-active have higher than average employment probability.

The inclusion of these variables leaves the effects of other control variables, including not only the demographic and individual level variables, but also the institutional variables, more or less unchanged.

Turning to multinomial logit analysis for the variable paidempl_nonpaidempl, in this case there are three categories (employed, inactive, unemployed) and we assume as baseline unemployed women.

Concluding Remarks

This paper has attempted to empirically assess the common belief, neglected in the economic literature, that religious affiliations may possibly affect female labor market participation. We do so by estimating several types of participation equations of women belonging to 47 different countries of the European continent, by using the European Values Study databank. We control not only for the classical individual characteristics of women – education, civil status, children, presence of parents and grand-parents in the household - , but also for such characteristics as living out of an income that is below the poverty line, the possibly different nationality of parents and partners, the different intensity with which individual women live their religious sentiments. We also control for a number of other possibly concurring factors: a) the role of policy variables, here represented by the amount of the social expenditure and the belonging to a given welfare regime; b) possible endogeneity bias due to the tendency of women to declare their religious affiliation in relation to their labor market status; c) the hypothesis that religion affects not the probability to find gainful employment, but to enter the labor market altogether.

Our enquiry finds strong evidence of the role of religious beliefs on the labor supply decisions of women. Women belonging to the Catholic, Orthodox and, even more, Muslim denominations present a higher risk of non-employment than the agnostics, while being a Protestant increases the probability for a woman to be employed. The impact is the greatest among the Muslim believers and the smoothest among the Catholic believers. More specifically, in the estimates that control for the type of welfare regime adopted in the country, a Catholic woman has a ceteris paribus probability to be employed about 15% lower than an agnostic woman, used as a baseline. The Orthodox and Muslim women have a probability of employment between 40 and 60% lower than average. The protestant believers have a probability of finding a job about 50% higher than average.

The greatest part of the religious effect is due to the groups that live their religious beliefs more intensively in the case of the Catholics and the Protestants, whereas the effect of religion is much more

common across the population in the case of the women that belong to the Orthodox and Muslim denominations.

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Appendix of Tables and Figures
Tables

Table 1 Descriptive statistics

Dependent variables		
Employed_inactive	1.586575	0.6690962
Employed_notemployed	0.51455	0.499792
Independent variables		
Below compulsory	0.12943	0.3356776
Compulsory	0.12943	0.3356776
Lower secondary	0.165553	0.371682
Secondary	0.410734	0.4919707
Post secondary	0.056498	0.2308829
Tertiary	0.235652	0.4244086
Age	50.34585	17.85852
Age squared	2853.626	1907.791
Married or registerd partnership	0.558223	0.4966023
Widowed, divorced, separeted	0.184607	0.387981
Single	0.250324	0.433203
Civil status	2.745065	2.12604
Number of children	1.580992	1.418246
Children with less than 10 years of age	0.077601	0.2675439
Parents are co-resident	1.786828	0.4095514
Grandparents are co-resident	1.9649	0.1840331
Women living below the poverty line	0.390234	0.4878064
Social expenditure pro-capite	34.2039	37.85572
Parents are immigrants	0.916971	0.2759285
Foreign partner	0.048859	0.2155737
Nationality	0.948412	0.2211952
Year of immigration	30.62054	18.40132
Welfare regimes		
Mediterranean countries	0.090841	0.2873844
Center European countries	0.139307	0.3462691
Scandinavian countries	0.082366	0.2749232
Anglosaxon countries	0.067241	0.2504403
Est European countries, entered in 2004	0.215988	0.4115088
Est European countries entered after 2004	0.0445	0.2062056
Est European countries, ex sovietic republic	0.15695	0.3637566
Ex Yugoslavian countries	0.15965	0.3662835
Turkey	0.043158	0.2032149
Religion		
Religiosity	0.181138	0.3851356
Catholic	0.277106	0.4475726
Protestant	0.10779	0.3101176

Evangelic	0.004057	0.0635615
Muslim	0.114682	0.3186398
Orthodox	0.232832	0.4226391
Religion other (Hindu, Buddist, Jews)	0.019755	0.1391566
Atei	0.170688	0.3762389
Active catholic	0.092907	0.2903035
Active catholic	0.184199	0.3876497
Active protestant	0.010149	0.1002289
Non active protestant	0.097642	0.2968316
Active evangelist	0.001749	0.0417878
Non active evangelist	0.002307	0.0479783
Active muslim	0.029134	0.1681837
Non active muslim	0.085548	0.2796969
Active orthodox	0.035845	0.185904
Non active orthodox	0.196987	0.3977255
Active other religion	0.007269	0.0849454
Non active other religion	0.012486	0.111042

Source: own elaboration on EVS data.

Table 2: Logit estimates of the determinants of the employment status of women aged between 18 and 60 years

Variable	Model A	Model B	Model C
	Odds ratio	Odds ratio	Odds ratio
age	1.3889***	1.4041***	1.4197***
age squared	0.9966***	0.9964***	0.9962***
Education (baseline: below compulsory)			
lower secondary	2.3222***	1.6279***	1.2063*
secondary	3.8164***	2.8320***	2.2179***
post secondary	5.7787***	4.2332***	3.0641***
tertiary	9.3513***	6.9108***	5.2759***
Parents are co-resident	1.4958***	1.3024***	1.2736***
Grandparents are co-resident	1.2538**	1.0065	1.0841
number of children	0.7305***	0.7347***	0.7251***
Women living below the poverty line	0.4398***	0.4863***	0.4922***
civil status (baseline: married)			
civil status	0.9480**	0.8988***	0.8853***
children with less than 10 years	0.7101***	0.6933***	0.6683***
Religion (baseline: agnostic)			
catholic		0.8901	0.8828
protestant		1.5822***	1.2093*
evangelic		1.0588	0.9461
muslim		0.3283***	0.6984***
orthodox		0.5600***	0.6684***
religion_other		0.8211	0.8478
atei		0.9243	0.9991
welfare regimes			
Mediterranean countries			5.9849***
Center European countries			6.4087***
Scandinavian countries			10.2930***
Anglosaxon countries			6.6310***
Est European countries, entered in 2004			7.2889***
Est European countries entered after 2004			8.1941***
Est European countries, ex sovietic republic			4.6823***
Ex Yugoslavian countries			3.3723***
Social expenditure procapite			0.9985
Number of observations	23963		

*Notes: *significant at 10%; **significant at5%; *** significant at 1%.*

The figures in the Table represent odds ratios. The odds ratio associated to a characteristic j is the relative risk of female participation for individuals with a given characteristics in the reference group. E.g., if the estimated odds ratio equals 1.5, the woman with a characteristics j have a 50% higher probability of participating to the labor market than the reference group; if the odds ratio equals 0.5 the individual with characteristics j have 50% lower probability of participating to the labour market than the reference group.

Source: own elaboration on EVS data.

Table 3. Odds ratio of logit model by employment status of women aged between 18 and 60 years-religiosity

Variable	Model D Odds ratio
Age	1.4318***
agesquared	0.9961***
compulsory_school (baseline no title)	1.2775
Secondary (baseline no title)	1.8261***
Tertiary (baseline no title)	2.5945***
	1.2511***
cores_grpa (baseline women with no co-resident grandparents)	1.0758
poors_Az1 (baseline women above poverty treshold)	0.4884***
Legal status (baseline women widowed, separeted, divorced or never married)	0.8933***
how many children do you have	0.7152***
child_minore10 (baseline women whitout first child under 10 years)	0.6684***
Religion	
catholic_active	0.6414***
catholic_nonactive	0.9692
protestant_active	0.7872
protestant_nonactive	1.2943**
evangelic_active	0.7488
evangelic_nonactive	1.1107
muslim_active	0.5315***
muslim_nonactive	0.6736***
orthodox_active	0.4887***
orthodox_nonactive	0.6947***
religion_other_active	0.8804
religion_other_nonactive	0.7822
Atei	0.9679
Welfare regimes	
Mediterranean countries	5.6144***
Center European countries	6.0403***
Scandinavian countries	9.3661***
Anglosaxon countries	5.7584***
Est European countries, entered in 2004	7.2963***
Est European countries entered after 2004	8.1097***
Est European countries, ex	5.2197***

sovietic republic	
Ex Yugoslavian countries	3.4246***
socialex_procapite	0.9989

*Notes: *significant at 10%; **significant at5%; *** significant at 1%. The figures in the Table represent odds ratios. Source: own elaboration on EVS data.*

Table 3. Odds ratio of logit model by employment status of women aged between 18 and 60 years-religiosity

Variable	ModelloA1	ModelloA2	ModelloA3
Employed			
Age	1.1909***	1.2002***	1.2034***
Age squared	0.9982***	0.9981***	0.9980***
compulsory_school	14.419	12.278	12.851
Secondary	1.7202***	1.3557**	1.5467***
Tertiary	2.4304***	2.4435***	2.3305***
Lstatus	0.9993	0.9246*	0.9014**
how many children do you have	0.8503***	0.8455***	0.8405***
child_minore10	0.7032***	0.6784***	0.6457***
cores_par	1.8085***	1.5634***	1.5047***
cores_grpa	1.5219***	1.2055*	12.004
poors_Az1	0.3253***	0.3669***	0.3962***
catholic		11.049	10.665
protestant		1.7015***	1.5765**
evangelic		22.803	15.922
muslim		0.3387***	0.6056***
orthodox		0.5482***	0.6429***
religion_other		0.8227	0.8810
atei		0.7768*	0.9160
dum_med			0.4119***
dum_centreu			0.2072***
dum_scand			0.2959***
dum_anglo			0.7773
dum_esteu_primi_entr			11.020
dum_esteu_second_entr			1.9769***
dum_esteu_exrep_soc_sov			1.3353***
dum_exyug			0.5665***
socialex_procapite			1.0225***
Constant	0.0099***	0.0403***	0.0248***
Inactive			
age	0.7307***	0.7289***	0.7290***
age2	1.0033***	1.0034***	1.0034***
compulsory_school	0.8480	0.8279	0.8892
secondary	0.4174***	0.4519***	0.6016***
tertiary	0.9093	0.9163	0.8864
lstatus	0.8244***	0.8173***	0.7873***
how many children do y~Q	1.2224***	1.2151***	1.2066***
child_minore10	0.8206**	0.8221**	0.7823**
cores_par	1.2529***	1.2345***	1.1548*
cores_grpa	1.3723***	1.3370**	1.2138*

|			
poors_Az1	0.6288***	0.6635***	0.7630***
catholic		1.3741**	1.4212**
protestant		11.646	10.549
evangelic		20.821	12.426
muslim		10.123	1.7849***
orthodox		0.8126	11.240
religion_other		0.9581	11.126
atei		0.7406**	0.9666
dum_med			0.1711***
dum_centreu			0.0742***
dum_scand			0.0936***
dum_anglo			0.3240**
dum_esteu_primi_entr			0.5125***
dum_esteu_second_entr			0.7740
dum_esteu_exrep_soc_sov			0.6836***
dum_exyug			0.3169***
socialex_procapite			1.0295***
Constant	2.4e+03***	2.6e+03***	2.6e+03***
N	24044	24044	24044

Base outcome : unemployed

Table 4: frequencies employed/not employed women by religious affiliation

Are you employed?	yes	no	total
roman catholic	4.700	6.264	10.964
% values	42,87	57,13	100
Orthodox	3.795	5.446	9.241
% values	41,07	59	100
Protestant	2.305	1.810	4.115
% values	56	43,99	100
Muslim	1.118	2.811	3.929
% values	28,46	71,54	100
free church/jew/hindu/buddist/other	422	531	953
% values	44,28	55,72	100
Total	12.340	16.862	29.202
	42,26	57,74	100

Figure 1: Female labour market participation and share of individuals in the population belonging to the catholic and orthodox denominations in 2008
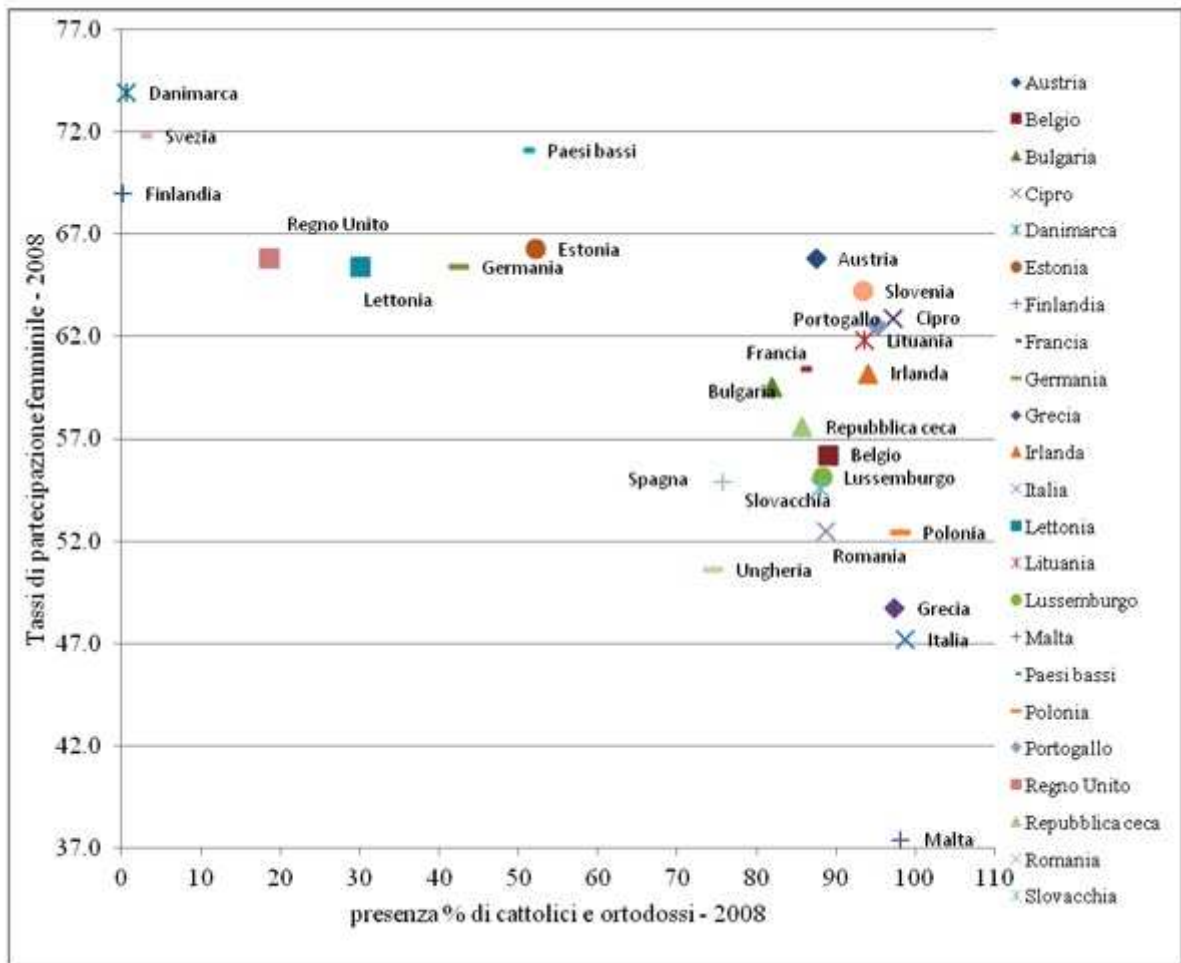
Note: in the case of Romania, Bulgaria, Cyprus, Greece and Estonia, the share of individuals belonging to the orthodox denomination is considered.
Source: our elaboration on Eurostat (female participation) data and European Value Survey (religious denomination).

Annex

Table A1. Variables' definition

Variable name	Definition
	Dependent variables
Employed_not employed	=1 if occupied; =0 otherwise
Employed_inactive	=1 if employed full-time, part-time or self employed; =2 if inactive; =3 if unemployed
	Independent variables
Compulsory_school	= 1, if compulsory school; = 0, otherwise
Secondary	= 1, Lower secondary or second stage of secondary school, upper secondary education, Post- secondary non- tertiary education; = 0, otherwise
Tertiary	= 1, first stage of tertiary education or second stage of tertiary education; = 0, otherwise
Legal status	= 1, if married or registered partnership; = 0, otherwise
Co-resident parents	= 1, if parents are co-resident; = 0, otherwise
Co-resident grandparents	= 1, if grandparents are co-resident; = 0, otherwise
poors_Az1	=1, if the individual' income is under poverty threshold; =0 otherwise
n_children	Number of children
Child_minore10	=1 if first child under 10 years; 0= otherwise
Catholic	=1 if belonging to chatolicism; =0 otherwise
Protestant	=1 if belonging to protestantism; =0 otherwise
Evangelic	=1 if belonging to Evangelic church; =0 otherwise
Muslim	=1 if belonging to Muslim religion; =0 otherwise
Orthodox	=1 if belonging to orthodox religion; =0 otherwise
Religion_other	=1 if belonging to jews, hindu and buddist religions; =0 if hindu, jews, buddist
Atei	=1 if now and in the past did not belong to a religious affiliation; =0 otherwise
Agnostic	=1 if agnostic; 0= otherwise
Religiosity	=1 if attending religious services more than once a week or once a week; =0 otherwise
Years of immigration	Years from which the interviewed lives in the country where he resides
nationality	=1 if interviewed has country nationality; 0= otherwise
Parents are immigrants	=1 if one or both parents are immigrants; 0= otherwise
Foreign partner	=1 if partner has foreign nationality
Active catholic	=1 if catholic and attend religious services more or once a week; =0 otherwise
Non active catholic	=1 if catholic and attend religious services less than once a week; =0 otherwise
Active protestant	=1 if protestant and attend religious services more or once a week; =0 otherwise
Non active protestant	=1 if protestant and attend religious services less than once a week; =0 otherwise
Active evangelist	=1 if evangelist and attend religious services more or once a week; =0 otherwise
Non active evangelist	=1 if evangelist and attend religious services less than once a week; =0 otherwise
Active muslim	=1 if muslim and attend religious services more or once a week; =0 otherwise
Non active muslim	=1 if muslim and attend religious services less than once a week; =0 otherwise
Active orthodox	=1 if orthodox and attend religious services more or once a week; =0 otherwise
Non active orthodox	=1 if orthodox and attend religious services less than once a week; =0 otherwise

Active other religion	=1 if other relgion and attend religious services more or once a week; =0 otherwise
Non active other religion	=1 if other religion and attend religious services less than once a week; =0 otherwise
Mediterranean countries	=1 if country belong to Mediterranean welfare regime; =0 otherwise
Center European countries	=1 if country belong to center european welfare regime; =0 otherwise
Scandinavian countries	=1 if country belong to scandinavian welfare regime; =0 otherwise
Anglosaxon countries	=1 if country belong to anglosaxon welfare regime; =0 otherwise
Est European countries, entered in 2004	=1 if country if part of est european countries, entered in EU in 2004; =0 otherwise
Est European countries entered after 2004	=1 if country if part of est european countries, entered in EU after 2004; =0 otherwise
Est European countries, ex sovietic republic	=1 if country if part of ex sovietic republic, entered in EU in 2004; =0 otherwise
Ex Yugoslavian countries	=1 if country is ex yugoslavian; =0 otherwise