Lucía Rey Ares
Universidad de Santiago de Compostela
lucia.rey@usc.es

Milagros Vivel Búa
Universidad de Santiago de Compostela
mila.vivel@usc.es

Sara Fernández López[1]
Universidad de Santiago de Compostela
sara.fernandez.lopez@usc.es

PRIVATE RETIREMENT SAVING: A STUDY OF ITS DRIVING FACTORS. THE CASES OF PORTUGAL AND SPAIN

ABSTRACT

This research analyzes the determinants of saving for retirement in Portugal and Spain on a sample of 1,080 individuals in 2011. This paper includes socioeconomic variables that have already been studied in the prior financial literature focused on other countries, as well as psychological and behavioral determinants that have not been analyzed in depth so far. The results highlight that retirement saving in Spain and Portugal is in general low -in fact, nearly 20% of the sample has a pension plan- and is positively related to education, job situation, area of residence, homeownership and saving habits; and negatively related to financial risk aversion and right-wing political orientation.

Keywords: determinants, retirement, saving, Portugal, Spain.

1. INTRODUCTION

Western societies are facing ageing demographic. In less than fifty years, population over 60 years will have duplicated representing close to 20% of worldwide population and 30% of European population (United Nations, 2013). This trend will certainly have important effects on the public finances of developed countries.

In addition, the long economic downturn suffered by many countries in Europe, and that deeply affects Portugal and Spain, seems demonstrate that traditional *pay-as-you-go* systems are unsustainable. As a consequence, in several countries the onus is inevitably shifting on private savings to supplement the necessary minimum provided by public pension schemes (European Commission, 2007). This trend places a share of the responsibility for retirement planning on individuals.

However, retirement preparation is a complex task because the information required for making decisions is extensive and complex, and the rules concerning Social Security and pensions are

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[1] Correspondence address: Sara Fernández López; Facultad de Ciencias Económicas y Empresariales; Universidad de Santiago de Compostela, Avenida Burgo das Nacións s/n, 15.782 Santiago de Compostela (España). Phone number: +34881811606. E-mail: sara.fernandez.lopez@usc.es.

rather elaborate (Lusardi, 2001). As a consequence, some experts suggest that planning for retirement is least pursued by those who need it the most, namely women, individuals who live alone, and the economically disadvantaged (Hayes and Parker, 1993).

The main objective of this paper is to identify the determinants of the individual's decision to save for retirement through private pension plans in Portugal and Spain. This analysis will allow us to know whether the Portuguese and Spanish are financially prepared for retirement, which is important for two main reasons. Firstly, the recent reforms of their public pension systems are likely to increase reliance on individual saving efforts. Since retirement planning is least pursued by those who need it the most, this shift to a retirement system where individual savings play a growing role means that retirement-income inequality of future retirees will increase. Secondly, this paper also complements the studies focused on European countries, which present important institutional differences. In particular, Portugal and Spain have been characterized by a short tradition of private pension plans and a greater reliance on public pension schemes.

This paper is organized as follows. Section 2 describes the theoretical background and the hypotheses. In section 3 the methodology is explained. In section 4 the empirical results of the univariate and multivariate analysis are presented. Finally, section 5 concludes by summarizing the most important findings, proposing some recommendations and describing the limitations and potential areas for future research.

2. RELATED LITERATURE

There is an extensive theoretical and empirical literature related to the decision of saving for retirement. Thus, the determinants of retirement savings are numerous and range from demographic factors to personality factors -such as the degree of extroversion or neuroticism- or psychological factors-as risk propensity or financial planning horizon-. Overall, they can be classified into two groups: those determinants that have been analyzed in the previous financial literature ("*traditional*" *determinants*) and those determinants that are relatively recent ("*psychological and behavioral*" *determinants*). Thus, based on the review of this literature, we identify a set of individual characteristics that might influence retirement savings.

"TRADITIONAL" DETERMINANTS

AGE: The life-cycle theory of savings predicts that savings will increase over the life-cycle; the older a person gets, the more likely he/she is to save for retirement (Modigliani and Brumberg, 1954; Harris et al., 2002; DeVaney and Chiremba, 2005). Life-cycle economic approach implies that people try to save before retirement in order to finance consumption during retirement (Hira et al., 2009).

However, Huberman et al. (2007) and Fernández et al. (2012) find a positive but decreasing relationship between individual's age and his/her decision to save for retirement. It should be noted that "*the decision of saving for retirement is not as straightforward as the life-cycle theory assumes, as to be fully rational the person would have to know the exact age of retirement, years of retirement and other relevant factors beforehand* [Korhonen (2011), p. 10]".

Hypothesis 1a: There is a positive relationship between age and the decision to save for retirement.

Hypothesis 1b: The probability of saving for retirement will be rising with age, but at a progressively lower rate.

EDUCATION: formal education is likely to be positively related to planning skills (Berheim and Scholtz, 1993; Seong-Lim et al., 2000), and it is expected to increase the probability of having adequate financial resources for retirement (Li et al., 1996). People with a low level of education have to make much effort to obtain and understand information about complex investment assets (Lusardi, 2001). It limits their possibilities of saving and investing for retirement, especially in financial products of any complexity. Thus, individuals facing high search costs will be less likely to save for retirement purposes.

Hypothesis 2: There is a positive relationship between education and the decision to save for retirement.

INCOME: The income level is one of the main determinants of retirement savings. Higher levels of income mean higher resources available for saving and investment, so individuals with greater incomes are more able to accumulate wealth for their retirement. Moreover, according to Lum and Lightfoot (2003), higher levels of income tend to obtain higher tax benefits of investing in retirement financial products. On the other hand, Huberman *et al.* (2007) suggest that low-income employees show a lesser need to save for retirement because they consider the public pension systems quite offset the wage gap.

Hypothesis 3: There is a positive relationship between income level and the decision to save for retirement.

EMPLOYMENT STATUS: income level and employment status tend to be highly and positively correlated. Therefore, the employment status indirectly affects the ability to save for retirement (García-Suaza et al., 2009; Fontes, 2011). Additionally, the employment status also has a direct influence on retirement planning. First, individuals with a higher employment status are more likely to have included in their job conditions several benefits such as health and disability insurance or life insurance coverage. This means higher resources available for saving. Second, individuals with a higher employment status are more likely to participate in pension plans. As they are used to thinking about retirement in their jobs, they will have improved their financial planning skills, and thus are expected to increase their retirement saving rates (Sundén and Surette, 1998; Papke, 2003).

Hypothesis 4: There is a positive relationship between being employed and the decision to save for retirement.

GENDER: gender differences can influence the probability of saving, but the authors do not agree on the sign. Thus, authors such as Malroutu and Xiao (1995), Díaz-Serrano and O'Neil (2004) and Dohmen et al. (2005) find that women are less likely to save as compared to men. It could be partially explained by gender differences in some individual characteristics, particularly in financial literacy, income levels and employment status (Fernández et al., 2012). According to Alessie et al. (2011), financial illiteracy is particularly acute for women. In addition, there is substantial evidence that women have lower life-time income and earn less than men. According to *Eurostat* statistics, the gender pay gap[2] in unadjusted form was in 2011

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[2] The unadjusted Gender Pay Gap (GPG) represents the difference between average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. The population consists of all paid employees in enterprises with 10 employees or more in NACE Rev. 2 aggregate B to S (excluding O).

of about 17.8% in Spain and 12.5% in Portugal. Finally, women are still much more likely to have part time and temporary jobs which usually do not provide health and life insurance benefits, reducing their resources available for saving and investment (Bajtelsmit and Bernasek, 1996; Shaw and Hill, 2002).

On the contrary, some empirical results suggest that women are more likely to save as compared to men. It could be explained by two reasons: i) the average life expectancy for women is longer than men, so they have to finance a longer retirement period (Lundberg and Ward-Batts, 2000; Huberman et al., 2007); ii) women are conscious that they will have lower income as retired compared to men because the public pension systems and the occupational pension plans are based on the earnings in the paid labour forces (Johannisson, 2008).

Drawing on previous evidence, we propose the following hypothesis:

Hypothesis 5: There is a positive / negative relationship between gender and the decision to save for retirement.

MARITAL STATUS: a common finding in the empirical literature is that investment decisions, especially for retirement purposes, are affected by marital status (Li et al., 1996; Lundberg and Ward-Batts, 2000; Johannisson, 2008). Married individuals are more likely to be concerned about the financial stability of the family, and thus are expected to be more likely to save for retirement. Lusardi (2001) also finds that individuals who have not thought about retirement are also less likely to be married. Blau et al. (2002) and Johannisson (2008) indicate that the decision on whether to save for retirement is made jointly within the marriage.

Hypothesis 6: There is a positive relationship between being married or living with a couple and the decision to save for retirement.

AREA OF RESIDENCE: Harris et al. (2002) for Australia and García-Suaza et al. (2009) for Colombia found that people living in urban areas have a higher propensity to save. Fontes (2011) also showed a positive relationship between living in an urban area and participating in a retirement plan in the United States. These results could be explained by the fact that people living in urban areas generally have a higher educational level, a higher level of income and a lower degree of risk aversion.

Hypothesis 7: There is a positive relationship between the fact of living in an urban area and the decision to save for retirement.

HOME OWNERSHIP: DeVaney and Chiremba (2005) and Fontes (2011) found empirical evidence that homeowners save more. Moreover, Malroutu and Xiao (1995) pointed out that households reach the greatest possibility to save when they have achieved the stage of "empty nest 1"; after children are raised and home mortgages are paid, resources are finally freed up for retirement saving.

Hypothesis 8: There is a positive relationship between being homeowner and the decision to save for retirement.

FINANCIAL RISK PREFERENCES: risk aversion (or tolerance) can also influence the decision of saving for retirement. Thus, people with lower risk aversion are more likely to save (Joo and Grable, 2000; Munell et al., 2000), as they tend to invest in riskier financial products with expected higher returns. Conversely, people with lower risk tolerance tend to invest in bonds or deposits, which usually provide lower financial returns. Moreover, DeVaney and Yang (2012) show that the negative relationship between financial risk aversion and the ownership of

a pension plan could be related to available resources, because people with high risk aversion have often a lower amount of economic resources and a higher liquidity preference.

Hypothesis 9: There is a negative relationship between risk aversion and the decision to save for retirement.

SAVING HABITS: saving for retirement should be considered in the context of a wider financial planning. Thus, some studies indicate that financial planning skills such as having longer planning horizons or saving habits have a positive influence on household savings (Malroutu and Xiao, 1995; Li et al., 1996; Seong-Lim et al., 2000; Ameriks et al., 2003; DeVaney and Chiremba, 2005; Lusardi and Mitchell, 2007). Furthermore, Hira et al. (2009) found that saving habits have a positive influence on maximizing contributions to pension plans.

Hypothesis 10: There is a positive relationship between having saving habits and the decision to save for retirement.

"PSYCHOLOGICAL AND BEHAVIORAL" DETERMINANTS

MATHEMATICAL AND FINANCIAL LITERACY: recent studies highlight that financial literacy -rather than formal education- is a more appropriate variable for being considered in the context of financial decision making. In this regard, Korhonen (2011) finds a positive relationship between having economics education and the probability of saving for retirement. Following Gough and Niza (2011), this relationship could be explained by an increase in cognitive and numeracy skills, the enhancement of retirement goals clarity and the improvement of financial planning competencies.

Hypothesis 11: There is a positive relationship between mathematical and financial literacy and the decision to save for retirement.

HEALTH: the effect of health on the individuals' decision to save for retirement has received little attention. According to Lum and Lightfoot (2003), the mechanisms through which individuals' health may influence retirement saving are mainly three. Firstly, individuals with health problems may be forced to take temporary jobs, which negatively affect participation in company pension plans. Secondly, they face major medical expenses. Thus, the amount of resources available to save through pension plans is reduced. Thirdly, they also may assume that their life expectancy will be short, showing a preference for consumption over saving.

Hypothesis 12: There is a positive relationship between the enjoyment of good health and the decision to save for retirement.

TRUST: literature on stock market participation has analyzed the effect of trust on financial decisions. Georgarakos and Inderst (2011) suggest that higher trust levels in financial institutions have a positive effect on the individual's participation in the stock market. In addition, Guiso et al. (2008) find that trusting people are more likely to buy shares and invest a significant portion of their wealth in the stock market. This argument can be extended to the individuals' decision to save for retirement through private pension plans.

Hypothesis 13: There is a positive relationship between trust and the decision to save for retirement.

POLITICAL ORIENTATION: according to Korhonen (2011) and Kaustia and Tostila (2011), the probability of investing in the stock market may significantly increase with right-wing political values. It could be partially explained by the fact that, political orientation reflects, to a certain extent, the voters' values, and right-wing political values have been found to be related

to "self-enhancement values of power and achievement" (Korhonen, 2011). Since we analyze the decision to save for retirement by investing in private pension plans, it can be hypothesized that:

Hypothesis 14: There is a positive relationship between right-wing political orientation and the decision to save for retirement.

INTERNET USAGE: it is assumed that those individuals who use the Internet are more likely to enhance their financial literacy, so they can increase their contribution to saving for retirement. In addition, Internet means access to multiple tools and information that can contribute to the reduction of barriers which can limit participation in pension plans.

Hypothesis 15: There is a positive relationship between Internet usage and the decision to save for retirement.

3. METHODOLOGY

3.1. THE DATA AND THE SAMPLE

The data used for the analysis are from the *Survey of Health, Ageing and Retirement in Europe*, (SHARE), sponsored by the European Commission, the German Ministry of Education and Research, the U.S. National Institute on Ageing as well as different national sources. The fourth wave, which is used in this paper, was conducted by *GfK* and *TNS-Demoscopia/Instituto Nacional de Estadística (INE)* in the cases of Portugal and Spain, respectively. SHARE is a multidisciplinary and cross-national panel database of micro data on socio-demographic information -including health, social and family networks or socioeconomic status- of more than 85,000 individuals (about 150,000 interviews) from 19 European countries, apart from Israel, aged 50 or over who speak the official language of each country and do not live abroad or in any institutions, as well as their spouses or partners regardless of age. Data collection for the fourth wave was carried out mainly in 2011 by using computer-assisted personal interviewing (CAPI) and a self-completion questionnaire.

From among the Portuguese and Spanish respondents (2,080 and 3,570, respectively), we selected the non-retired aged less than 65 years -the legal age of retirement in both countries when survey's data collection was carried out-, resulting in a sample size of 1,808 individuals. Table 1 shows the technical information of the survey.

Table 1. Technical data of the study

	SHARE DATABASE		
Universe	Individuals aged 50 and over, and their spouses/partners independently of their age.		
Information collection	*Computer-assisted personal interviewing* (CAPI) and also self-completion of a paper & pencil questionnaire.		
Sample size	1,166 people in Spain and 642 in Portugal		
Data collection	Years 2010 and 2011		
Data release	November 2012		

3.2. DEFINITION AND MEASUREMENTS OF THE VARIABLES

3.2.1. Dependent variable

On the basis on the SHARE questionnaire, the dependent variable was defined as a dummy variable coded as 1 if the respondent answers affirmatively to the following question: *"Do you or your husband/wife/partner currently have any money in individual retirements accounts?"*, and zero otherwise. The questionnaire also clarifies that "a *individual retirement account is a retirement plan that lets the person put some money away each year, to be -partially- taken out at retirement time"*.

3.2.2. Independent variables

As independent variables, we have selected a number of factors that presumably would influence the decision of saving for retirement in the two countries. Most of them are dichotomous variables that have been re-coded from the original questionnaire. Table 2 contains more detailed information on the definition of these independent variables.

Additionally, a country dummy variable was included in order to capture idiosyncratic cultural or institutional factors of Portugal and Spain. These ones are aspects shared by the individuals in one country that affect decisions of saving for retirement. In short, this dummy variable reflects the support for the individuals' retirement planning in each country once the individual factors, such as education, gender or age have been discounted.

Table 2. Definitions of the independent variables and predictions

VARIABLES	DEFINITION	PREDICTION
Age/ Age^2	Natural logarithm of...respondent's age / ...age squared	+/-
Education	Natural logarithm of the years of full-time education	+
Income	Natural logarithm of household overall net monthly income	+
Job situation	Whether the respondent is employed or self-employed -including working for family business- (1) or is in other situations -including being: unemployed; permanently sick or disabled; homemaker; rentier; living off own property or doing voluntary work- (0)	+
Gender	Whether or not the respondent is male (1 or 0)	-/+
Marital status	Whether or not the respondent has a formal commitment -which includes being married or being registered as common-law partners- (1 or 0)	+
Area of residence	Whether or not the respondent lives in an urban area (1 or 0) We consider an "urban area" when the respondent lives in a big city or in the suburbs or outskirts of a big city; while we consider a "rural area" when he/she lives in a large town, in a small town or in a rural area or village.	+
Homeowner	Whether or not the respondent owns the house where he/she lives (1 or 0)	+
Financial risk aversion	Whether the respondent is willing to take some financial risk (0) or is not willing to take any financial risk (1)	-
"Traditional" saving habit	Whether or not the respondent has any of the following products: bank account, transaction account, saving account or postal	+

VARIABLES	DEFINITION	PREDICTION
	account, or money in contractual saving for housing (1 or 0).	
"Sophisticated" saving habit	Whether or not respondent has money invested in any of the following products: government or corporate bonds, stocks or shares, mutual funds or managed investment accounts (1 or 0).	+
Mathematical and financial literacy	See Appendix A	+
Health status	Whether or not the respondent's health status is: - *Very good* (1 or 0): Respondent reports an excellent or very good health status. - *Good* (1 or 0). Respondent reports a good health status. - *Fair* (1 or 0) [Reference group]. Respondent reports a fair or bad health status.	+
Trust	On a scale from 0 to 10, where 0 means the need of being careful in dealing with people and 10 means that most people can be trusted, respondent's trust is: - *Low* if his/her punctuation is between 0-2 (1 or 0) [Reference group] - *Medium* if his/her punctuation is between 3-7 (1 or 0) - *High* if his/her punctuation is between 8-10 (1 or 0)	+
Political orientation	On a scale from 0 to 10, where 0 means the left and 10 means the right, respondent's political orientation is: - *Left-wing* if his/her punctuation is between 0-3 (1 or 0) [Reference group] - *Center* if his/her punctuation is between 4-6 (1 or 0) - *Right-wing* if his/her punctuation is between 7-10 (1 or 0)	+
Internet use	Whether or not the respondent uses Internet frequently (1 or 0)	+
Country	Whether or not the respondent lives in Portugal or Spain (1 or 0)	+/-

4. RESULTS OF THE EMPIRICAL ANALYSIS

4.1. UNIVARIATE ANALYSIS

Summary statistics of selected dependent and independent variables are displayed in Table 3. In 2011, 20.5% of the respondents saved for retirement. The final sample comprises 1,808 individuals, mostly women (62.72%) with a formal commitment (86.53%) and an average age of 55.5 years.

Regarding to the economic variables, most of the individuals were employed or self-employed (52.69%) and the average net income of the household was 5,069€. 86.14% of the sample had saving financial products which could be labeled as "traditional", while only 8.27% had invested in more sophisticated saving financial products. This could be related to the high risk aversion reported by respondents, since only 12.69% was willing to take any financial risk. Most of the individuals were homeowners (82.08%). Moreover, close to 76% of the homeowners didn't have mortgages loans on their property.

Most of the sample lived in a "rural area" (61.15%). The average years of education were 8.39 years and the level of numeracy was generally low, as well as the use of the Internet (34%). Regarding political preferences, most of the individuals claimed to have a center orientation.

Respondents were mostly Spanish (64.49%), which is consistent with the figures of population, as in 2011 Portuguese population represented 22.66% of Spanish population, according to ODCE statistics.

Table 3. Summary statistics of the variables

		Observations	Mean	Standard deviation	Minimum	Maximum
Retirement plans		931	20.52%	0.404	0	1
Age		1808	55.47	5.036	27	64
Education		1381	8.39	4.824	0	25
Income		932	5069.02	15532.82	1	360000
Job situation		1784	52.69%	0.499	0	1
Gender		1808	37.28%	0.484	0	1
Marital status		1388	86.53%	0.342	0	1
Area or residence		888	38.85%	0.488	0	1
Homeowner		932	82.08%	0.384	0	1
Mortgage or loans on home property		742	24.39%	0.430	0	1
Financial risk aversion		1347	87.31%	0.333	0	1
"Traditional" saving habit		1017	86.14%	0.346	0	1
"Sophisticated" saving habit		931	8.27%	0.276	0	1
Mathematical and financial literacy	None	1363	8.14%	0.274	0	1
	Low	1363	69.26%	0.462	0	1
	Medium	1363	17.31%	0.379	0	1
	High	1363	5.28%	0.224	0	1
Health	Very good	1796	23.11%	0.422	0	1
	Good	1796	39.81%	0.490	0	1
	Fair	1796	37.08%	0.483	0	1
Trust	Low	1348	13.35%	0.340	0	1
	Medium	1348	65.50%	0.476	0	1
	High	1348	21.14%	0.408	0	1
Political preferences	Left	1192	22.65%	0.419	0	1
	Center	1192	59.06%	0.492	0	1
	Right	1192	18.29%	0.387	0	1
Internet use		1359	34.00%	0.474	0	1
Country		1808	35.51%	0.479	0	1

Notes: Continuous variables are not in logs. Mean value is expressed in unit values in the case of continuous variables and in percentage values in the case of dichotomous variables -showing the percentage of people that satisfy the condition under which the value of the variable equals one-.

Table 4 shows the mean values of the independent variables and the results of a t-test of the differences in means between the individuals who have a private pension plan and those who have not.

Table 4. Mean values of the independent variables by savers and non-savers for retirement

	Obs.	Private pension plan		p-value
		Yes	No	
Age	931	55.37	55.94	0.121
Education	698	10.26	7.79	0.000
Income	930	5533.92	4954.46	0.646
Job situation	930	0.738	0.445	0.000
Gender	931	0.492	0.351	0.000
Marital status	704	0.780	0.769	0.775
Area of residence	887	0.522	0.354	0.000
Homeowner	930	0.874	0.806	0.029
Financial risk aversion	693	0.725	0.906	0.000
"Traditional" saving habit	931	0.990	0.926	0.001
"Sophisticated" saving habit	929	0.236	0.042	0.000
Mathematical and financial literacy				
None	698	*0.040*	*0.091*	*0.043*
Low		*0.658*	*0.721*	*0.131*
Medium		*0.228*	*0.144*	*0.013*
High		*0.074*	*0.044*	*0.136*
Health				
Very good	931	*0.330*	*0.201*	*0.000*
Good		*0.424*	*0.380*	*0.263*
Fair		*0.246*	*0.419*	*0.000*
Trust				
Low	696	*0.094*	*0.152*	*0.071*
Medium		*0.664*	*0.634*	*0.499*
High		*0.242*	*0.214*	*0.470*
Political orientation				
Left	627	*0.296*	*0.219*	*0.057*
Center		*0.556*	*0.575*	*0.689*
Right		*0.148*	*0.206*	*0.122*
Internet use	697	0.544	0.297	0.000
Country	931	0.387	0.332	0.154

Notes: Obs. refers to the number of observations. A p-value less than 0.05 leads us to conclude that there are significant differences between the two groups considered. Continuous variables are not in logs.

There are significant differences between savers and non-savers for retirement in terms of education, employment status, gender, area of residence, homeownership, financial risk preferences, saving habits, numeracy, health and Internet usage. In this sense, it seems that retirement savers have higher levels of formal education and numeracy and higher probabilities of having both traditional and sophisticated financial saving products. They also use the Internet to a greater extent and show lower financial risk aversion. Compared to non-savers, they are mostly men and homeowners, live in urban areas, enjoy a better health and are employed or self-employed. These differences are all consistent with the hypotheses previously proposed.

4.2. MULTIVARIATE ANALYSIS

In this section we present the results of the econometric models that have been applied in order to analyze the determinants of the decision to save for retirement. Due to the dichotomous nature of the dependent variable, we had to use estimation different from the Ordinary Least Squared. Most empirical studies test the hypotheses established in the theoretical framework by means of conditional likelihood models. Therefore, we have chosen to apply a probit model. This model establishes a nonlinear relation between a dummy dependent variable and a set of independent variables. The model specification is carried out with the following normal distribution equation.

$$Probability(\,Y_i = 1\,) = \phi(\,\beta_0 + + \sum_{j=1}^{10} \beta_j \; Traditional_i + \sum_{j=11}^{15} \beta_j \; Psychobehavioral_i + \beta_{16} Country_i\,)$$

The dependent variable (Y_i) quantifies the individual's probability of saving for retirement, i is the index of individuals and ϕ denotes the standard normal distribution function.

To test the previous hypotheses, different empirical models were estimated (Tables 5 and 6). Model 1 constitutes the basis of the following models, which add new variables that may affect private saving for retirement. The first variables we add are those that we labeled as traditional determinants, and then we add the psychological and behavioral determinants, most of which have not been studied in depth so far.

Table 5. Average partial effects (I)

	M1	M2	M3	M4	M5
	Dependent variable: having a individual pension plan				
Age	33.115	23.235	21.75	21.768	20.421
	(19.16)	(17.45)	(16.61)	(16.76)	(17.68)
Age^2	-4.141	-2.891	-2.702	-2.712	-2.549
	(2.39)	(2.17)	(2.07)	(2.09)	(2.20)
Education	0.137***	0.097**	0.077*	0.068*	0.061*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Income	0.035**	0.024*	0.017	0.011	0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gender	0.077*	0.026	0.02	0.024	0.025
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Marital status	0.014	0.022	0.03	0.029	0.02
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)
Country	0.095**	0.078*	0.075*	0.045	0.053
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Job situation		0.141***	0.126***	0.112***	0.111***
		(0.033)	(0.030)	(0.033)	-0.033
Financial risk aversion		-0.175***	-0.133**	-0.132*	-0.132*
		(0.05)	(0.05)	(0.05)	(0.05)
"Traditional" saving habit			0.140**	0.145**	0.144**
			(0.05)	(0.05)	(0.04)
"Sophisticated" saving habit			0.239***	0.213**	0.198**
			(0.07)	(0.07)	(0.07)
Area of residence				0.078*	0.088**
				(0.03)	(0.03)
Homeownership					0.083*
					(0.03)
N	680	675	673	638	638
Wald X^2 (d.f.)	45.29***	82.12***	93.05***	85.74***	92.89***
	(7 d.f.)	(9 d.f.)	(11 d.f.)	(12 d.f.)	(13 d.f.)
R^2 Mcfadden	0.0727	0.1203	0.1498	0.1531	0.16
Pseudolikelihood	-330.3553	-312.3071	-301.4083	-281.0634	-278.7522
Akaike criterion (d.f.)	676.7107	644.6141	626.8166	588.1267	585.5044
	(8 d.f.)	(10 d.f.)	(12 d.f.)	(13 d.f.)	(14 d.f.)
Hosmer-Leshow X^2 (8 g.l.)	6.74	5.84	6.87	5.09	2.29
	(8 d.f.)	(8 d.f.)	(8 d.f.)	(8 d.f.)	(8 d.f.)

Notes: Probit regression estimates of the relation between the likelihood of saving for retirement and the listed variables. Table shows average partial effects (APE). As noted by Bartus (2005), APEs provide a more realistic interpretation of the estimation results and more consistent estimates than marginal effects at the mean. The Stata *margeff* command was used to calculate the APEs. ***, **, * denotes significance at the 0.001, 0.01 and 0.05, respectively. Robust standard errors are in parentheses. d.f. denotes degrees of freedom. Continuous variables are in logs.

Table 6. Average partial effects (II)

	Dependent variable: having a individual pension plan				
	M6	**M7**	**M8**	**M9**	**M10**
Age	20.577	21.594	19.793	20.481	20.249
	(17.72)	(17.73)	(22.15)	(17.69)	(17.68)
Age²	-2.568	-2.692	-2.485	-2.557	-2.526
	(2.21)	(2.21)	(2.76)	(2.21)	(2.20)
Education	0.061*	0.05	0.066*	0.062*	0.053
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Income	0.009	0.007	0.008	0.008	0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Gender	0.024	0.023	0.029	0.025	0.023
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Marital status	0.02	0.017	0.026	0.02	0.021
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Country	0.052	0.06	0.06	0.053	0.052
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Job situation	0.111***	0.107**	0.101**	0.111***	0.108**
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Financial risk aversion	-0.132*	-0.122*	-0.129*	-0.131*	-0.125*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
"Traditional" saving habit	0.143**	0.142**	0.141**	0.144**	0.142**
	(0.04)	(0.05)	(0.05)	(0.04)	(0.05)
"Sophisticated" saving habit	0.198**	0.202**	0.209**	0.199**	0.192**
	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)
Area of residence	0.089**	0.089**	0.091**	0.090**	0.085**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Homeownership	0.084*	0.086*	0.094*	0.084*	0.083*
	(0.03)	(0.03)	(0.04)	(0.03)	(0.03)
Mathematical and financial literacy: low	0.019				
	(0.06)				
Mathematical and financial literacy: medium	0.012				
	(0.07)				
Mathematical and financial literacy: high	0.029				
	(0.10)				
Health: very good		0.055			
		(0.05)			
Health: good		0.055			
		(0.04)			
Political orientation: center			-0.049		
			(0.04)		
Political orientation: right			-0.098*		
			(0.04)		
Trust: medium				0.005	
				(0.05)	
Trust: high				-0.006	
				(0.05)	
Internet usage					0.027
					(0.05)
N	638	638	575	638	638
Wald X² (d.f.)	95.64***	95.50	92.49***	92.87***	93.89***
	(16 d.f.)	(15 d.f.)	(15 d.f.)	(15 d.f.)	(14 d.f.)
R² Mcfadden	0.1602	0.1637	0.1625	0.1602	0.1608
Pseudolikelihood	-278.68515	-277.5213	-257.38223	-278.70215	-278.49359

Akaike criterion (d.f.)	591.3703 (17 d.f.)	587.0426 (16 d.f.)	546.7645 (16 d.f.)	589.4043 (16 d.f.)	586.9872 (15 d.f.)
Hosmer-Lemeshow X^2 (8 g.l.)	3.88	3.78	11.77	5.18	3.58

Notes: Probit regression estimates of the relation between the likelihood of saving for retirement and the listed variables. Table shows average partial effects (APE). As noted by Bartus (2005), APEs provide a more realistic interpretation of the estimation results and more consistent estimates than marginal effects at the mean. The Stata *margeff* command was used to calculate the APEs. ***, **, * denotes significance at the 0.001, 0.01 and 0.05, respectively. Robust standard errors are in parentheses. d.f. denotes degrees of freedom. Continuous variables are in logs.

As is shown Tables 5 and 6, there are a group of variables that are significant in all the estimated models. Thus, the decision to save for retirement is positively related to the level of formal education, employment status, saving habits, area of residence, and homeownership, and negatively related to financial risk aversion and a right-wing political orientation.

The level of formal education, measured by the years of full-time education, has a positive impact on the decision to save for retirement, as the results found by Sundén and Surette (1998), Seong-Lim et al. (2000), Lum and Lightfoot (2003), DeVaney and Chiremba (2005), García-Suaza et al. (2009), Fontes (2011) or DeVaney and Yang (2012). This relation could be explained by a reduction in the information and psychological barriers that keep individuals from participating in voluntary pension plans. However, our results fail to find support for the hypothesis that mathematical and financial literacy exerts a positive effect on retirement savings.

The individuals' socioeconomic status is tested in the models by introducing two proxy variables: household income and employment status. While the former fails to be significant, the latter is positively related to the probability of saving for retirement. These results are consistent with the findings of García-Suaza et al. (2009) and Fontes (2011) for the Colombian and American cases, respectively. The estimated coefficients indicate that the employed individuals have, on average, nearly 12% higher probability of saving for retirement than the unemployed.

Empirical evidence does not support the hypotheses that gender and marital status affect the decision to save for retirement. In this regard, Johannisson (2008) and Sundén and Surette (1998) proposed that a combination of gender and marital status would be more suitable than the independent study of both variables.

As we mentioned, a country dummy variable is considered to capture idiosyncratic cultural or institutional factors for both countries. However, it fails to be significant. This result could be partially explained by the similarities between Portuguese and Spanish pension systems, making that the profiles of the retirement savers do not differ too much between countries. It is worth noting that most of the previous studies on the decision to save for retirement are focused on Anglo-Saxon countries, where retirement incomes depend to a large extent on individuals' private savings during their working life, which is quite different from the Spanish and Portuguese contexts, where public pensions play a key role.

Similarly, empirical evidence does not support the hypothesis that the individual's health has an impact on the decision to save for retirement. In Portugal and Spain, health care is mainly based on the public system with universal coverage, in contrast with other countries, such as the

United States, where health care is mainly based on private health insurance, whose hiring may decrease the resources available to save for retirement.

As we expected, financial risk aversion is strongly and negatively related to the decision to have a pension plan. Particularly, the results suggest that those individuals who refuse to take any financial risks have almost 14% lower probability of having a retirement plan. These results are consistent with the findings of DeVaney and Yang (2012).

Having saving habits is positively and strongly related to the decision to save for retirement. The results indicate that those individuals who show more "sophisticated" saving habits have a higher probability of saving for retirement than those who show more "traditional" saving habits

Those individuals who live in urban areas have almost 9% higher probability of saving for retirement than those who live in rural areas. This result is consistent with those found by García-Suaza et al. (2009) and Fontes (2011), and could be explained by the fact that people who live in urban areas usually have higher educational levels and higher economic resources, which in turn have a positive influence on retirement savings.

As we expected, homeownership also has a positive effect on the decision to have a pension plan. In particular, homeowners have nearly 8% higher probability of saving for retirement. Thus, homeownership can be seen as a driving force of saving for retirement, mainly if the homeowners do not have mortgage charges, as it is the case of most of the individuals in our sample.

Empirical evidence does not support the hypotheses that the use of the Internet and trust affect the decision to save for retirement.

Finally, contrary to expected, the empirical evidence partially supports that people who have a right-wing political orientation, compared to those who have a left-wing orientation, have a lower probability of saving for retirement. This finding could be partially explained by the fact that in 2011 (when the survey was carried out) right-wing parties were elected to government in Portugal and Spain. At that moment, right-wing voters believed that this change would help in restoring market confidence and economic recovery, and basic services such as public pensions systems would become sustainable again. These thoughts may have discouraged the right-wing voters to privately save for retirement.

5. CONCLUSIONS

The ageing process is a success of the developed societies, but, at the same time, is one of the biggest challenges that they face. The sustainability of the *pay-as-you-go* pension systems is being jeopardized. As a result, it becomes necessary to look for other alternatives that allow the livelihood of elderly. Voluntary saving in private pension plans has emerged as one of the most popular alternatives. In this context, if there are individual factors that determine having or no pension plans, the shift to a retirement system more based on individual savings means that retirement-income inequality of future retirees will increase.

The main objective of this paper has been to identify the determinants of the individual's decision to save for retirement through private pension plans in Portugal and Spain. Our results have shown that the decision to save for retirement is positively related to the level of formal

education, employment status, saving habits, area of residence, and homeownership, and negatively related to financial risk aversion and a right-wing political orientation.

This study contributes to the literature in three ways. First, it provides a profile of the Portuguese and Spanish retirement savers. Other works had previously covered some of the issues analyzed here mainly focusing on the Anglo-Saxon countries. Thus, this paper complements the studies focused on European countries, which present important institutional differences. In particular, Portugal and Spain have been characterized by a greater reliance on public pension schemes and a shorter tradition of private pension plans.

Secondly, this paper considers relatively new psychological and behavioral determinants of the decision to save for retirement, most of which have been hardly analyzed in the previous financial literature, as it is the case of the variables referred to political orientation, trust or Internet usage.

Thirdly, our findings provide quantitative evidence on the determinants of the individuals' retirement attitudes. Moreover, the results have show that most of the Portuguese and Spanish do not have a private pension plan for retirement purposes, questioning how well they are financially prepared for retirement. With our results in mind, the policy-makers responsible for designing pension schemes will be able to make better decisions in order to develop policy responses that would encourage sufficient additional saving. This objective is particularly important in the present economic context where both trends in ageing and employment and the ongoing economic downturn will put intense pressure on the already hard-pressed public pension systems.

Thus, the results show the need of accounting for the individuals' heterogeneity in retirement planning. Therefore, any policy geared towards enabling individuals to prepare adequately for retirement should consider that different population groups present marked differences in retirement saving behavior. Thus, educational programs can help people, especially the economically disadvantaged or those leaving in rural areas, better plan their retirement and make informed decisions about voluntary private pension savings. These programs will be most effective if they are targeted to particular population subgroups, in order to address differences in saving needs and in preferences.

Finally, this paper presents some limitations. It is worth noting the high age of the individuals in the database. After discarding those over 65 years, the sample size has been considerably reduced. Additionally, our results are based on a cross section of data that show different people at the same moment. Although it is tempting to draw conclusions about how the decision of saving for retirement varies over the life-cycle based on these results, which would be incorrect. Therefore, future research on this topic might benefit by collecting data with a longitudinal nature. This will allow knowing whether the economic downturn started in 2007 has impact on the ownership of private pension plans. Similarly, it could be interesting to study the interaction between gender and marital status variables.

6. ACKNOLEGMENTS

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APPENDIX A. Mathematical and financial literacy

The questions on mathematical and financial literacy are as follows:

Q1. *If the chance of getting a disease is 10 per cent, how many people out of one thousand would be expected to get the disease?* The possible answers are 100, 10, 90, 900 and another answer.

Q2. *In a sale, a shop is selling all items at half price. Before the sale a sofa costs 300 euro. How much will it cost in the sale?* The possible answers are 150, 600 and another answer.

Q3. *A second hand car dealer is selling a car for 6,000 euro. This is two-thirds of what it costs new. How much did the car cost new?* The possible answers are 9,000, 4,000, 8,000, 12,000, 18,000 and another answer.

Q4. *Let's say you have 2,000 euro in a saving account. The account earns ten per cent interest each year. How much would you have in the account at the end two years?* The possible answers are 2,420, 2,020, 2,040, 2,100, 2,200, 2,400 and another answer.

If a person answers Q1 correctly he/she is then asked Q3 and if she answers correctly again she is asked Q4. Answering Q1 correctly -but not Q3- or answering Q1 incorrectly -but not Q2- results in a score of what we define as "low" mathematical and financial literacy; answering Q3 correctly but not Q4 results in a score of "medium" mathematical and financial literacy while answering Q4 correctly results in a score of "high" mathematical and financial literacy. On the other hand if he/she answers Q1 incorrectly she is directed to Q2. If she answers Q2 incorrectly she gets a score of "none" mathematical and financial literacy.