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Research Paper

The determinants of privately saving for retirement: the cases of Portugal and Spain

LUCÍA REY ARES[1]
SARA FERNÁNDEZ LÓPEZ[2]
MILAGROS VIVEL BÚA[3]

Abstract

Purpose: Population ageing is a challenge for many developed countries, but constitutes a matter of particular concern for Southern European countries, which are still suffering the consequences of the economic downturn started in 2007. Therefore, our main objective is the study of the potential driving factors of saving for retirement in Portugal and Spain, two countries where public pension systems play a crucial role.

Design/methodology/approach: The research comprises two main sections: firstly, the literature review of the recent advances in this area; and secondly, an empirical analysis of data from the Survey of Health, Ageing and Retirement in Europe.

Findings: The results of the multivariate analysis highlight that saving for retirement in Portugal and Spain is in general low -in fact, nearly 20% of the sample have a pension plan- and is positively related to education, job situation, residential area, homeownership and saving habits; and negatively related to financial risk aversion and right-wing political orientation.

Research limitations/implications: A potential limitation of the study could be the use of cross-sectional data. However, the research has important implications in the future design of financial retirement planning, as the need for considering individuals' heterogeneity.

Originality/value: The main contributions of this research are related to the characterization of Portuguese and Spanish savers for retirement -as opposed to previous studies, mainly focused on Anglo-Saxon countries-; as well as the inclusion of new potential driving factors of retirement saving, such as political orientation or health status, hardly studied by previous financial literature.

Keywords: Determinants, retirement, saving, pension plans, Portugal, Spain.

[1] University of Santiago de Compostela. E-mail: lucia.rey@usc.es.
[2] University of Santiago de Compostela.
[3] University of Santiago de Compostela.

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1. INTRODUCTION

Population ageing is one of the greatest economic and social challenges that western societies will have to face. Life expectancy has been growing during the last decades, as opposed to fertility rates. As a result, 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).

These socio-demographic trends, together with the serious economic downturn suffered by many countries in Europe, and that deeply affects Portugal and Spain, imply a big uncertainty concerning the sustainability of traditional *pay-as-you-go* systems. As a consequence, in several countries the onus is inevitably shifting towards 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 not an easy task as the information required for making decisions is extensive and complex, and the rules concerning Social Security and pensions are 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, two countries where the public pension system plays a crucial role. This analysis will allow us to know whether the Portuguese and the 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 shorter tradition of private pension plans and a greater reliance on public pension schemes.

The rest of the paper is organized as follows. The second and third sections present the theoretical background and the methodology, respectively. The fourth section describes the empirical results of the univariate and multivariate analysis. Finally, the fifth section draws the conclusion, 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. As a result, the determinants of retirement saving are numerous and range from a wide variety of factors, from demographic to personality -such as the degree of extroversion or neuroticism- or psychological ones.

Table 1 summarizes the main empirical studies on retirement saving determinants.

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Table 1. Summary of the main empirical studies on retirement savings

Author/-s	**Country: unit of analysis – Source (Year)**	**Dependent variable (Model)**	**Results**
Alessie *et al.* (2012)	The Netherlands: 1,091 households – *DNB Household Survey* (2005)	Simple retirement planning (MCO)	Financial knowledge: basic (+) and advanced (+); Age intervals: 50-70 (+); Gender: man (-); High trust (+)
DeVaney and Chiremba (2005)	USA: 3,428 households with pre-retired - *Survey of Consumer Finances* (2001)	Having a retirement account (Logit)	Age (+); Education (+); Risk tolerance (+); Saver (+); Planning horizon (+); Spending (-); Self-employment (-); Homeownership (+); Married (+); Race: white (+)
Fernández *et al.* (2012)	Europe (eight countries): 8,044 people - *The EU Market for Consumer Long Term Retail Savings Vehicle* (2007)	Saving for retirement (Probit)	Age (+); Age squared (-); Financial literature (+); Household's income (+); Type of employment (+); Saving habit (+)
Fontes (2011)	USA: 62,251 people- *Survey of Income and Program Participation* (2004)	Retirements plans' participation (Logit)	Age (+); Education (+); Gender: man (+); Housing (+); Urban residence (+); Marital status: married (+); Number of children (-); Immigrant (-); Employed (+)
Guataquí *et al*. (2009)	Colombia *Gran Encuesta Integrada de Hogares* (2007)	Decision of saving on a pension fund (Logit)	Age (+); Gender: man (+); Education (+); Urban residence (+); Marital status: couple (+); Wealth (+); Employees (+)
Harris *et al*. (2002)	Australia: 17,585 people - *Melbourne Institute Survey* (1999)	Saving decision (Probit)	Age (+); Income (+); Wealth (+); Urban residence (+); Housing property (+); Number of children (-); Optimism (-)
Hira *et al.* (2009)	USA: 911 people – *National telephone survey (2005)*	Ownership of IRA/Keogh accounts (Logit)	Age (+); Race: Caucasian (+); "Early" investor (+); Sources of financial information (+); Investment activity (+)

Huberman *et al.* (2007)	USA: 793,794 workers – *Vanguard Group* (2001)	Contribution to a retirement plan (Probit)	Gender: woman (+); Pension plan (+); Age (+); Age squared (-); Job seniority (+) /squared (-); Financial wealth of the neighbourhood (+); Income (+)
Lee *et al.* (2000)	Korea: 3,913 households - *Survey of Consumer Finances* (1995)	Saving (Logit)	Income (+); Education (+); Dependent children (-); Race: white (+); Planning horizon (+); Saving (+); Credit card (-)
Lum and Lightfoot (2003)	USA: 7,350 households with members between 51 y 61 years – *Health and Retirement Study* (1992)	Having a pension plan (Logit)	Age (+); Gender: man (+); Races: white and black (+); Education (+); Respondent's health: (+); Spouse's health (+); Income (+)
Lusardi (2001)	USA: households whose breadwinner has between 51 and 61 years - *Health and Retirement Study* (1992)	Total and financial net wealth (MCO)	Education (+); Marital status: married (+); Children (-); Leaving inheritance (+); Past negative shocks (-); Receiving inheritance (+); Retirement (+)
Yang and DeVaney (2012)	USA: 2,696 households - *Survey of Consumer Finances* (2007)	Having retirement assets (Logit)	Race: white (+); Age (+); Income (+); Education (+); Expected age of retirement (+); Risk (+); Spouse's education (+); Health (+)

Overall, the factors that influence retirement saving decision could be classified, according to their degree of novelty, into two groups: those determinants that have been analyzed in depth in previous financial literature and those determinants that are relatively recent and are more related to psychological and behavioral aspects. Thus, based on the review of financial literature, we identify a set of individual characteristics that might influence retirement savings and that will be described below, starting by the potential determinants with lower degree of novelty.

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 this stage of life (Hira *et al*., 2009).

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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.

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 low levels of education have to make a special effort to obtain and understand information about complex investment assets (Lusardi, 2001), which limits their possibilities of saving and investing for retirement, especially in the aforementioned products.

Income. Income level is one of the main determinants of retirement savings. Higher levels of income mean higher resources available for saving and investment, and so individuals with greater incomes are more able to accumulate wealth for their retirement. Moreover, according to Lum and Lightfoot (2003), people with 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 display a lower need to save for retirement since they consider that public pension systems will offset the wage gap.

Job situation. Income level and job situation tend to be highly and positively correlated. Therefore, employment status indirectly affects the ability to save for retirement (García-Suaza *et al*., 2009; Fontes, 2011). Additionally, employment status also has a direct influence on retirement planning. Firstly, individuals with higher employment status are more likely to have included in their job conditions several benefits such as health or life insurance coverage. This means higher resources available for saving. Secondly, individuals with higher employment status are more likely to participate in occupational pension plans. Considering that they are used to thinking about retirement planning in their jobs, they will have improved their financial planning skills, and therefore, it is expected an increase on their retirement saving rates (Sundén and Surette, 1998; Papke, 2003).

Gender. Gender differences can influence the probability of saving, even though 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, which could be partially explained by the persistence of 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. In fact, according to *Eurostat* statistics, the gender pay gap [3] in unadjusted form was in 2011 of about 17.8% in Spain and 12.5% in Portugal. And finally, women still have higher probabilities of holding part-time and temporary jobs which usually do not provide health and life insurance benefits, which diminish 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. Two reasons could contribute to explain this empirical relation: i) the average life expectancy for women is longer than men, implying that they will have to finance a longer retirement period (Lundberg and Ward-Batts, 2000; Huberman *et al*., 2007); ii) women awareness that they will have lower income as retirees, since public pension systems and occupational pension plans are mainly based on wages and labour earnings (Johannisson 2008).

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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 concern about the financial stability of their 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 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.

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 higher propensities to save in general. Fontes (2011) goes further, and proves the existence of 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 higher educational levels, higher income levels and lower degrees of risk aversion.

Home ownership. DeVaney and Chiremba (2005) and Fontes (2011) found empirical evidence that homeowners save more. Additionally, Malroutu and Xiao (1995) pointed out that households reach the greatest possibility of saving when they have achieved the stage of "empty nest 1"; that is, after children have been brought up and home mortgages have been paid, resources are finally available for retirement saving.

Financial risk preferences. Attitude toward risk-taking can also influence the decision of saving for retirement. In this regard, people with lower levels of risk aversion are more likely to save (Munnell *et al*. 2001), as they tend to invest in riskier financial products with higher expected returns. Conversely, people with lower risk tolerance tend to invest in bonds or deposits, which usually provide lower financial returns. Moreover, Yang and DeVaney (2012) showed that the negative relationship between financial risk aversion and the ownership of a pension plan could be related to available resources, because people with higher risk aversion have often lower amounts of economic resources and higher liquidity preferences.

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.

The potential determinants that follow have not been analyzed in depth so far in the financial literature of retirement savings. Namely, political orientation and Internet usage has been more researched in the context of stock market participation. Below, there is a brief review of these determinants.

Mathematical and financial literacy. Recent studies highlight that financial literacy variable-rather than formal education- is more suitable for being considered in the context of financial decision-making (Lusardi and Mitchell, 2007). In this regard, Korhonen (2011) finds a positive relationship between having economic 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, an enhancement of retirement goals clarity and an improvement in financial planning competencies.

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Health. The effect of health on the individuals' decision about saving for retirement has received little attention in the financial literature. 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 will negatively affect participation in occupational pension plans; secondly, they usually face major medical expenses, having thus less economic resources for saving; thirdly, they also may assume that their life expectancy will be shorter, showing a preference for consumption over saving.

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).

Internet usage. It is posited that those individuals who regularly use Internet are more likely to enhance their financial literacy, so they can increase their contribution to saving for retirement. In addition, Internet allows immediate and free access to multiple tools and information that can contribute to the reduction of barriers which can limit participation in pension plans. Analogously, Bogan (2008) proves that Internet usage positively influences the shareholding of United States (US) households.

3. METHODOLOGY

3.1. THE DATA AND THE SAMPLE

The data used for the analysis come from the *Survey of Health, Ageing and Retirement in Europe*, (SHARE), sponsored by the European Commission, the German Ministry of Education and Research, the US National Institute on Ageing and different national sources. SHARE is a multidisciplinary and cross-national data set that collects information on the individual life circumstances of all eligible members of different households from 19 European countries, as well as Israel. A household is eligible for participation in the survey if at least one household member is aged 50 or over.

Data collection for the fourth wave, the one used in this study, was carried out mainly in 2011 by using *Computer-Assisted Personal Interviewing* (CAPI) and a self-completion questionnaire.

From among 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 2 shows the technical information of the survey.

Table 2. 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	1,808 individuals (642 Portuguese and 1,166 Spanish)
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 of 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*n 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. The continuous variables have been transformed into their logarithmical form in order to avoid problems with the different scaling of variables. Table 3 contains more detailed information on the definition of these independent variables, as well as, drawing on previous evidence, the expected sign of each variable.

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 3. 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; annuitant;	+

Variables	Definition	Prediction
	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) It is considered an "urban area" when the respondent lives in a big city or in the suburbs or outskirts of a big city; while it is considered 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 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).	+
Numeracy	Answers to four questions on 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.	+
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	+

Variables	Definition	Prediction
	0) [Reference group] - *Centre* 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 4. In 2011, 20.52% of the respondents saved for retirement through pension plans. The final sample comprises 1,808 individuals, mostly women (62.72%) with a formal commitment (86.53%) and an average age of 55.47 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 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%), and among them, close to 76% did not have any mortgage loans on their dwelling.

Most of the sample lived in "rural areas", as only 38.85% lived in big cities or in their outskirts. 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 centre political orientation. Respondents were mostly Spanish (64.49%), which is consistent with the figures of population, as in 2011, Portuguese population represented 22.86% of Spanish population, according to OECD statistics.

Table 4. 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 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
Numeracy	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
Political preferences	Left	1192	22.65%	0.419	0	1
	Centre	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

[a] 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 5 shows the mean values of the independent variables and the results of a t-test of the differences in means between the households who have a private pension plan and those who have not.

Table 5. 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
Numeracy				
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
Political orientation				

Left		0.296	0.219	0.057
Centre	627	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

b Obs. refers to the number of observations. A p-value lower 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 saving habits -through traditional and sophisticated financial saving products-. They also use 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 -Y_i-, we opt for an estimation different from the *Ordinary Least Squared* model. Most empirical studies mentioned in the theoretical framework test the hypotheses by means of conditional likelihood models. Therefore, we have chosen to apply a *probit* model, which 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.

$$Probability(Y_i = 1) = \varphi(\beta_0 + + \sum_{j=1}^{12} \beta_j \ \ Traditional_i + \sum_{j=13}^{17} \beta_j \ \ Psychobehavioral_i + \beta_{18} Country_i)$$

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 6 and 7). Model 1 constitutes the basis of the following models, which add new variables that might affect private saving for retirement. The first variables added are those defined as traditional, followed by the psychological and behavioural determinants, most of which have not been studied in depth so far.

Table 6. *Probit* estimations of retirement saving (I)

	Dependent variable: having an individual retirement account				
	M1	**M2**	**M3**	**M4**	**M5**
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*** (7 d.f.)	82.12*** (9 d.f.)	93.05*** (11 d.f.)	85.74*** (12 d.f.)	92.89*** (13 d.f.)
R^2 Mcfadden	0.0727	0.1203	0.1498	0.1531	0.16
Pseudolikelihood	-330.355	-312.307	-301.408	-281.063	-278.752
Akaike criterion (d.f.)	676.7107 (8 d.f.)	644.6141 (10 d.f.)	626.8166 (12 d.f.)	588.1267 (13 d.f.)	585.5044 (14 d.f.)
Hosmer-Lemeshow X^2 (8 g.l.)	6.74 (8 d.f.)	5.84 (8 d.f.)	6.87 (8 d.f.)	5.09 (8 d.f.)	2.29 (8 d.f.)

[c] *Probit* regression estimates of the relation between the likelihood of saving for retirement and the listed variables. Table 5 shows *Average Marginal Effects* (*AMEs*). As noted by Bartus (2005), *AMEs* provide a more realistic interpretation of the estimation results and more consistent estimates than marginal effects at the mean. ***, **, * denotes significance at the 0.1%, 1% and 5% levels, respectively. Robust standard errors are in parentheses. d.f. denotes degrees of freedom. Continuous variables are in logs.

Table 7. *Probit* estimations of retirement saving (II)

	Dependent variable: having a individual retirement account			
	M6	**M7**	**M8**	**M9**
Age	20.577 (17.72)	21.594 (17.73)	19.793 (22.15)	20.249 (17.68)
Age^2	-2.568 (2.21)	-2.692 (2.21)	-2.485 (2.76)	-2.526 (2.20)
Education	0.061* (0.03)	0.05 (0.03)	0.066* (0.03)	0.053 (0.03)
Income	0.009 (0.01)	0.007 (0.01)	0.008 (0.01)	0.008 (0.01)
Gender	0.024	0.023	0.029	0.023

		(0.03)	(0.03)	(0.03)	(0.03)
Marital status		0.02	0.017	0.026	0.021
		(0.03)	(0.03)	(0.04)	(0.03)
Country		0.052	0.06	0.06	0.052
		(0.03)	(0.03)	(0.04)	(0.03)
Job situation		0.111***	0.107**	0.101**	0.108**
		(0.03)	(0.03)	(0.04)	(0.03)
Financial risk aversion		-0.132*	-0.122*	-0.129*	-0.125*
		(0.05)	(0.05)	(0.05)	(0.05)
"Traditional" saving habit		0.143**	0.142**	0.141**	0.142**
		(0.04)	(0.05)	(0.05)	(0.05)
"Sophisticated" saving habit		0.198**	0.202**	0.209**	0.192**
		(0.07)	(0.07)	(0.08)	(0.07)
Area of residence		0.089**	0.089**	0.091**	0.085**
		(0.03)	(0.03)	(0.03)	(0.03)
Homeownership		0.084*	0.086*	0.094*	0.083*
		(0.03)	(0.03)	(0.04)	(0.03)
Numeracy [Ref.: none]	Low	0.019			
		(0.06)			
	Medium	0.012			
		(0.07)			
	High	0.029			
		(0.10)			
Health [Ref.: fair]	Very good		0.055		
			(0.05)		
	Good		0.055		
			(0.04)		
Political	Centre			-0.049	

orientation [Ref.: left]			(0.04)	
	Right		-0.098* (0.04)	
Internet usage				0.027 (0.05)
N	638	638	575	638
Wald X^2 (d.f.)	95.64*** (16 d.f.)	95.50 (15 d.f.)	92.49*** (15 d.f.)	93.89*** (14 d.f.)
R^2 Mcfadden	0.1602	0.1637	0.1625	0.1608
Pseudolikelihood	-278.685	-277.521	-257.382	-278.494
Akaike criterion (d.f.)	591.3703 (17 d.f.)	587.0426 (16 d.f.)	546.7645 (16 d.f.)	586.9872 (15 d.f.)
Hosmer-Lemeshow X^2 (8 g.l.)	3.88	3.78	11.77	3.58

[d] *Probit* regression estimates of the relation between the likelihood of saving for retirement and the listed variables. Table 6 shows *Average Marginal Effects* (*AME*). As noted by Bartus (2005), *AMEs* provide a more realistic interpretation of the estimation results and more consistent estimates than marginal effects at the mean. ***, **, * denotes significance at the 0.1%, 1% and 5% levels, respectively. Robust standard errors are in parentheses. d.f. denotes degrees of freedom. Continuous variables are in logs.

As is shown in 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 level of formal education, employment status, saving habits, area of residence and homeownership; and negatively related to financial risk aversion and 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 was also found by Sundén and Surette (1998), Lee *et al*. (2000), Lum and Lightfoot (2003), DeVaney and Chiremba (2005), Fontes (2011) or Yang and DeVaney (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 numeracy 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 Guataquí *et al*. (2009) and Fontes (2011) for the Colombian and United States cases, respectively. The estimated coefficients indicate that 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, Sundén and Surette (1998) proposed

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that a combination of gender and marital status would be more suitable than the independent study of these 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, which could cause 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 lives, 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 a 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 account. These results are consistent with the findings of Yang and DeVaney (2012). On the other hand, 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.

With regard to the area of residence, 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 Guataquí *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 Internet affects the decision to save for retirement. However, contrary to expected, 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

Population ageing is a success of developed societies, but, at the same time, is one of their biggest challenges. The sustainability of the *pay-as-you-go* pension systems is being jeopardized, and 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 decision to save for retirement through private pension plans of Portuguese and Spanish households. Our results have shown that the decision to save for retirement is positively related to level of formal education, job situation, saving habits, area of residence and homeownership, and negatively related to financial risk aversion and 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 behavioural 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 the political orientation. Thirdly, our findings provide quantitative evidence on the determinants of the individuals' retirement attitudes. Moreover, the results have shown that most of the Portuguese and Spanish households do not have a private pension plan for retirement purposes, questioning how well financially prepared for retirement they are. 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 behaviour. Thus, educational programs can help people, especially the economically disadvantaged or those leaving in rural areas, to 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. Firstly, due to data limitations encountered in our study, particularly the high percentage of people in the sample older than 50 years, the results should be taken carefully. In fact, the findings should be regarded as reflecting the determinants of the over-fifties' decision to save for retirement. Therefore,

the results cannot be easily extrapolated to the general population (i.e., the effect of internet use on retirement savings could have been different in younger individuals). Lack of data did not give us opportunity to perform the analysis separately for different cohorts of age, which is a possible direction for future research.

Additionally, our results are based on a cross section of data that shows 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, this would be incorrect. Therefore, future research on this topic might benefit from collecting data with a longitudinal nature. This will allow knowing whether the economic downturn started in 2007 has had any impact on the ownership of private pension plans. Similarly, it could be interesting to study the interaction between gender and marital status variables.

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EDNOTES:

[1] Correspondence address: Lucía Rey Ares; Faculty of Economy and Business; University of Santiago de Compostela, Avenida Burgo das Nacións s/n, 15.782 Santiago de Compostela (Spain). Phone number: +34881811687. E-mail: lucia.rey@usc.es.

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[3] 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).

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APPENDIX A. Numeracy

The questions on mathematical and financial literacy, or numeracy, 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.

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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 he/she answers correctly again he/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" numeracy; answering Q3 correctly but not Q4 results in a score of "medium" numeracy while answering Q4 correctly results in a score of "high" numeracy. On the other hand if he/she answers Q1 incorrectly is directed to Q2. If he/she answers incorrectly Q2 gets a score of "none" numeracy.