A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

FINANCIAL PLANNING AND RETIREMENT INCOME WORRIES IN PORTUGUESE MILLENNIALS: WHAT IS THE ROLE OF FINANCIAL KNOWLEDGE AND INCOME IN THE PREPARATION FOR RETIREMENT

CHRISTOPHER ANDRÉ MANDL FIGUEIRAS, 34114

A project carried out on the Master's in Management Program, under the supervision of:

Professor Luís F. Martinez

January 3rd, 2020

Abstract

Western populations are aging with consequences for the future of public pension systems. Little research was made regarding planning for retirement in young adults, especially in Portugal. This study aims to understand whether Portuguese Millennials worry about the future of the pension system and to what extent Financial Knowledge and income influence planning for retirement. A survey with 180 responses suggested that Millennials in Portugal are equally worried compared to older individuals and that Financial Knowledge is not related to Financial Behavior. Income influenced the level of Financial Knowledge, Financial Behavior and participation in private pension funds (PPR).

Keywords: Retirement; Young Adults; Financial Behavior; Financial Knowledge; Pension Systems.

1.) Introduction:

The population is aging in most western and developed countries like it has never before. A big challenge that our society will encounter in the upcoming years concerns the amount of support that older generations will collect from their governments in the future. The aging of the population is driven mainly by three demographic trends that, according to the European Union (2018), will prevail until the year of 2070 and make Europe the oldest region on Earth. These trends can be described, on the one hand, by low fertility rates together with a significant increase in the life expectancy and, on the other hand, by a negative migration flow that, together, will change the dynamics of the retirement systems across westernized nations (European Union, 2018).

While uncertainty concerning macroeconomic and structural changes in the world that we know today is causing a climate of ambivalence regarding the sustainability and future of the current public pension system models (Clark & Newhouse, 2016), governments have already started to shift the responsibility of the pension provision from the collective (sate) to the individual (Catalán, Guajardo, & Hoffman, 2009).

Financial planning for retirement is a sophisticated process that involves numerous decisions and actions throughout one's life in order to guarantee the accumulation of financial resources by the period of retirement and, for the past years, it has been considered a subject of study for economists. Nevertheless, a set of recent studies have also tried to include individual and psychological variables in order to broaden the explanatory scope of theoretical models (Topa & Herrador-Alcaide, 2016). The current literature on financial preparation and planning for retirement has been either focused on older individuals approaching the retirement age or focused on samples that represent all working ages. Naturally, this opens a gap when it comes to understanding the behavior and attitudes towards retirement planning in younger generations (Hershey, Henkens, & van Dalen, 2010). Furthermore, recent studies have been

focusing their attention mainly on Anglo-Saxon countries or, in some cases, on the Iberian population (Ares, López, & Búa, 2015) making it difficult to understand how the Portuguese society, in specific younger generations, are preparing themselves for times of uncertainty and ambiguity concerning financial resources.

Hence, the aim of this study will be to understand whether Portuguese Millennials are prepared for the challenges of their generation regarding financial literacy and retirement planning while better understanding how income influences their behavior. Being a country with general low saving rates and where only a small portion of the population has a private pension plan (Ares et al., 2015), it is rather tempting to assume that most of its young adults, in an early career stage, suffer from lack of Financial Knowledge and therefore fail to plan for their retirement. However, with an increase in the overall education level of the country, Portugal has been improving its financial and numerical literacy within younger generations (OECD Pisa Report, 2016). It is thus crucial to study the Financial Behavior and Knowledge of this generation in order understand whether Millennials are aware of the level of support and income losses that can be expected from the state in the future.

2.) Theoretical Background

2.1) Demographic Changes and their Consequences for Pension Systems:

Population aging is an issue that affects many western and developed countries. Today, Europe is the oldest region in the globe and will probably maintain this distinction until 2050 according to the projections of the European Union (2019). Nonetheless, this issue has a peculiar impact on southern European countries, which is fostered by three major tendencies: Low comparable birth rates (total births per woman), a significant increase in life expectancy and negative outcomes of migratory flows (Chand & Markova, 2018).

The total EU population is expected to grow from 511 million in 2016 to 520 million in 2070, however, the working-age population (15-64) will decline from 333 million in 2016 to 292 million in the same period due to the three reasons mentioned above (European Union, 2018). In the Union, life expectancy of men at birth (in the projection course) will increase by 7.8 years. For women, an increase in life expectancy of 6.6 years is predicted. Concerning the Portuguese reality, according to the same report, men's life expectancy will be nearly 86 years by 2070 and women's 90. The total fertility rate (TFR) in almost all member states is expected to rise from 1.56 to 1.79 between 2016 and 2070. With regard to the Portuguese scenario, the EU projections foresee a slower growth, meaning that TFR 2070 will only represent 1.59 children per woman - one of the lowest in the euro area (European Union, 2018). Finally, according to the same source, net migration inflows to the Union (per year), are expected to fall from 1.5 million to 0.8 million people in the same forecasting period.

These changes in society will naturally have a significant impact on a number of social and economic issues for most of the developed nations. At the moment, the majority of public retirement schemes use the pay-as-you-go (PAYG) method, where pensions today are being paid by the ongoing working class, which will suffer a significant decline in the near future (Godínez-Olivares, Boado-Penas & Haberman, 2016), as noted above. Governments are trying to solve this problem by extending the required years of contribution, reducing early retirement policies, and increasing job opportunities for older workers. In this way, the state can expand the exit age for the labor market while increasing the statutory pension simultaneously (Cebulla & Willkinson, 2019).

Governments from different countries are also encouraging people to invest in private pensions schemes in order to reduce the negative outcomes of an aging population and supplement public pensions (Ares et al., 2015). In Portugal, there are compulsory, contributory and non-contributory public pensions - which are paid by the state - and supplementary or

voluntary private pensions. Private pensions in Portugal are complementary to those provided by public systems (Moreira, 2019). Despite their increasing popularity, private pension systems only serve as a fraction of the total pension systems in the majority of the countries, specifically in southern European countries (Ares et al., 2015). According to Moreira (2019), in 2013, the expenditure on private pension funds in Portugal was only a small portion (7%) of the total expenditure on pensions. This scenario contrasts with countries like the Netherlands or Switzerland, where nearly a quarter of the total expenditure in pensions (25% and 26% respectively) was related to private pension schemes (Moreira, 2019).

2.2) Drivers of income worries in the population:

Research has been done in order to understand if certain populations are concerned with their available financial resources in the future and whether they are taking active actions to assure a decent standard of living according to their expectations (Hershey et al., 2010). The same source also suggests that retirement income worries are stronger in nations that suffer from a greater level of income disparity and where population aging projections are strong. In addition, this study has shown that income worries tend to be higher in more defenseless populations such as; older generations, females, poorly educated people or in poor health conditions. Nevertheless, previous findings suggested that the knowledge acquired throughout the lifetime about issues in later-life can, in fact, reduce the level of anxiety provoked by the imminent retirement transition (Hayslip, Beyerlein & Nichols, 1997). Hence, concerns regarding the available financial resources in later life, are expected to be lower among pre-retirees when compared to young adults.

Unfortunately, to this point, most of the literature is based on samples of either older individuals close to retirement or very broad samples that focus on all working ages. In order to define “young working adults” for this dissertation, the same definition will be used as in one of the few researches made regarding financial planning for retirement in a younger

population (Bačová, Dudeková, Kostovičová & Baláž, 2017). Having this said, the focus of this study will be working-class individuals aged 20 to 35 years which are in line with the so-called *generation millennial*. Hence, young working adults will also be referred as Millennials throughout this dissertation.

Bearing in mind that Portugal has a high level of income inequality when compared to other OECD countries (Thévenot, 2017), that it is the fourth country with the oldest population in the world (IIASA 2018), and that an increase in age has been proved to reduce anxiety of later-life issues, it is possible to deduct from the above-mentioned literature that Millennials (young working adults) in Portugal should be more worried about their retirement income in the future than older individuals. Therefore, the following hypothesis was created:

H1: Millennials (Young working adults in Portugal) are more worried about their retirement income than older working individuals in Portugal.

2.3) Financial Planning in Young Adults and the role of Financial Knowledge:

After reviewing the drivers of income worries across different populations, it also important to investigate the reasons why some individuals (both young and older) are more concerned than others. It has also been scientifically proven before that poor financial literacy in adulthood is linked to a series of negative events. In other words, insufficient Financial Knowledge and literacy can be connected to low retirement savings (Fernández-López, Otero, Vivel, & Rodeiro, 2010) and bad investment decisions (Lusardi & Mitchell, 2011). In addition, other authors have found that financial knowledge has a positive effect on the investment and saving patterns (Ekerdt, Hackney, Kosloski & DeViney, 2001). As stated by Bačová et al. (2017), the literature has shown that involvement in retirement and saving rates is profoundly connected to the inherent level of the financial literacy of an individual (Croy, Gerrans, & Speelman, 2010; Van Rooij, Lusardi, & Alessie, 2011). Coherent with this stream of logic,

Mitchell and Moore (1998) proved that the lack of knowledge is a major handicap in planning for the retirement.

Even though there has not been done enough research in this field, another driver for the success in financial planning for retirement are the different personality types. These characteristics have also been proven to affect the way individuals behave regarding financial planning for retirement (Drever et al., 2015). In addition, other authors demonstrated that long-term goals have a powerful influence on an individual's saving behavior (Boisclair, Lusardi, & Michaud, 2015).

To disprove the authors mentioned above, there is empirical evidence suggesting that a higher level of financial literacy cannot be directly associated to a more responsible saving behavior, especially when considering samples of young adults or students (Jones, 2005). This contradiction opens a gap in the literature and creates simultaneously an opportunity to better understand if (and how) financial literacy in younger generations is directly related to better and more sustainable saving behaviors in the long term. In the particular case of this paper and as mentioned before, the primary focus of this study is young professional adults aged between 20 and 35 years where students will represent a low comparative proportion of the overall sample. Based on this premises and the abundant literature defending that financial literacy impacts the saving behavior, the following hypothesis can be deducted:

H2: Financial and investment knowledge is positively related to future saving and investment behavior (for young working adults in Portugal/Millennials).

2.4) Financial Planning: The Role of Income in Savings and Private Pension Schemes:

Income is probably one of the most critical variables when studying an individual's saving behavior. An increase in income is usually related to a greater level of spending but also higher levels of savings and investment due to the amount of available resources (Ares et al., 2015). Hence, consumption is positively correlated with income, however, some authors

defend the consumption increases with income, “although in a less than proportional way” (Cooper & Keynes, 1997). Other relevant authors in the economic literature have also stated that income has “a non-negligible role in the determination of savings” (Modigliani & Brumberg, 1954).

Concerning the participation in private (or supplementary) pensions schemes, and in line with the reasoning above, Vivel-Búa, Rey-Ares, Lado-Sestayo & Fernández-López, (2019) have shown how some authors demonstrated that income is the most important variable when it comes to participating in private pension schemes (Cappelletti, Guazzarotti & Tommasino, 2012), also known as PPR (Plano Poupança Reforma) in Portugal. In other words, wealthier individuals are able to save more money and have more financial resources available to participate in private pension schemes. Similarly, other authors whose research was focused on the British population were able to demonstrate that high levels of income can be associated to a greater participation in private pension schemes (Foster & Smetherham, 2013). Nevertheless, there are also other reasons why individuals with a higher income tend to invest in supplementary pensions schemes. According to Lum and Lightfoot (2003), there are higher tax benefits for wealthy people when investing in retirement assets. In conclusion, as individuals have more financial resources, they are able to subscribe to more voluntary pension schemes. On the other hand, some findings suggest that people with a lower income level tend to trust more the public pension systems and are more willing to rely on it (Huberman, Iyengar & Jiang, 2007). This is to say that low-income individuals tend to trust more the public pension system by fully depending on the retirement provided by the state.

Another curiosity about private pension plans is that the amount of time someone paid into the Social Security System is positively correlated to the participation in supplementary pension schemes (Torricelli, Brancati & Santantonio, 2016). Having this said, people who have worked and discounted for longer periods in their lives tend to invest more frequently in private

pension plans when compared to younger individuals who have started to work recently. According to Vivel-Búa et al., (2018), this results from the fact that these workers are more conscious of the usefulness of private supplementary pension schemes and hence allocate more resources in those assets. In addition, research done with the British population has shown that it is common for individuals to start investing in private pension funds in their late thirties, forties or even later in life (Foster & Smetherham, 2013).

This reasoning suggests the idea that most individuals tend to realize only in later years that state pension will not be enough to keep the same level of financial comfort. Jacobs-Lawson and Douglas (2005) have concluded that the underlying reasons for an individual's savings behavior is crucial since many (if not most) retirees will depend on private pension schemes and savings to keep an equitable amount of income (Ferraro & Su, 1999; Blank, 1999; Wiatrowski, 1993).

Based on the available literature, it is possible to deduct that the income is one of the key determinants for private savings, being positively correlated with the amount of money invested in private pensions schemes. On the other hand, age (which can be translated into the number of years someone has been discounting for Social Security) plays also an important role in this equation. With Portugal being a country with low average levels of income, high levels of youth unemployment and historically low rates of participation in private saving funds, it is possible to deduct the following hypothesis:

H3: The income level is positively related to the participation in private pension schemes in young working adults in Portugal/Millennials.

3.) Method

3.1) Sample and Procedures:

In order to test the hypothesis, data was collected from an online survey (N=296) where workers older than 20 years with at least one year of working experience had to answer a set

of different questions. Participants were recruited based on their age, years of working experience and geographical location (Portugal). The survey was distributed on social media platforms like *Facebook* and *Instagram* to address the younger participants, and through *LinkedIn* and specific *Facebook* groups (Descontos e Dicas de Poupança, Poupanças Domésticas) to address an older population. The present survey was created using *Qualtrics XM* and the data was analyzed using the statistics *SPSS* software. Minimum age and working experience criteria were created to guarantee participants had the necessary income, responsibility and the decision power on their financial planning. Finally, the survey was open for 11 days between November 12th and November 23rd.

The number of valid responses was 180, since 41 were incomplete, 4 under the age of 20 years, 67 did not have more than one year of working experience and 4 did not want to proceed with the survey. Of all the valid participants, 138 (76.7%) were aged between 20 and *35* and 42 (23.3%) were aged older than 35. The average annual gross income group was 13.501€ - 19.000€ with 21.1% of the respondents belonging to this category. To the question "*Are you worried that your income in old age will not be adequate to cover your later years?*", the mean score value was 6.23 - with 0 corresponding to "not worried at all" and 10 corresponding to "extremely worried". Finally, to the question "*Are you saving (or have you saved) in order to live comfortably in old age*", 72 participants (40%) answered with "Yes" and 108 (60%) answered this question with "No".

Furthermore, all the respondents were categorized into three age groups (1=Aged below 20 years; 2=Aged between 20 and 35 years; 3=Older than 35 years) and people aged below 20 years were excluded from this study (age group 1). Both age groups 2 and 3 were then compared with each other in order to test the first hypothesis. For the remaining two hypotheses, only the participants aged 20 to 35 years (age group 2) were considered. In addition, to test the second hypothesis, two groups of questions were created and posteriorly

compared using a test score. The first group being all the questions related to the overall Financial Knowledge of the individuals (Appendix IV: questions 3.1. until 3.9.1.), and the second group including all the questions related to the Financial Behavior (Appendix IV: questions 4.1. to 4.7.) of the respondents. In conclusion, for each group, a specific test score was given according to the number of correct answers and both groups were then compared in terms of its level of correlation.

For the last hypothesis (whether the income level is positively related to the participation in private pension schemes), the gross annual income class was compared to the last question, whether individuals owned a private pension fund or not.

3.2) Measures:

The questionnaire consisted of 23 questions where the first 2 corresponded to the screening questions: Age (1=Less than 20; 2=Between 20 and 35, 3=More than 35) according to the scale of Bačová et al. (2017) and whether individuals are currently employed or have been employed in the past twelve months (0=No; 1=Yes).

To test the first hypothesis, whether respondents were worried with their future income during their retirement years, a single item indicator on a scale (0=Not at all worried; 10=Extremely worried) with the question "*Are you worried that your income in old age will not be adequate to cover your later years*" was created (Hershey et al., 2010).

To test the second hypothesis, whether young working Portuguese individuals' financial literacy is positively related to future saving and investment behaviors, two groups of questions were created and later compared using a test score (Financial Knowledge vs. Financial Behavior). Both groups included questions from the OECD INFE Measuring Financial Literacy (2011) report's core questionnaire that were adapted and rescaled to fit the needs and purposes of the present study. For the first group of questions, also referred as

Financial Knowledge, a matrix table to check whether individuals have heard of certain financial products (1=Yes; 0=No) was designed. Examples of these financial products were: "*Mortgage*" and "*Credit Card*". Participants were given one point for each product they knew and zero points for each product they did not know. In addition to this matrix, multiple choice questions (1=Correct answer; 0=Incorrect answer) e.g. "*how much would be in the account at the end of five years remembering there are no fees?"*, true or false questions (1=Correct answer; 0=Incorrect answer) e.g. "*An investment with a high return is likely to be high risk*", and text entry questions (1=Correct answer; 0=Incorrect answer) e.g. "*Imagine that five brothers are given a gift of $ 1,000. If they have to share the money equally, how much does each one get?*" were added to this first group of questions. Again, for each right answer, participants were given one point and zero points for each wrong answer. Finally, to test the second group of questions also known as Financial Behavior, seven single item indicators with ratings on scale (0=Completely disagree; 10=Completely agree) were asked. An example of question for this group is: "*I pay my bills on time*". For each question, respondents were given the amount of points corresponding to the score given on each answer. Since values closer to 10 were aimed to represent a more responsible and prudent financial behavior for all the responses, the scale of questions 4.2. und 4.3. had to be turned around during the statistical analysis in order to stay coherent with the other questions.

Lastly, to test the third hypotheses, individuals were asked their average gross annual income that was categorized into 11 classes according to the same criteria as the framework of "Escalões de Rendimento Bruto (em euros)" in the table of "Agregados familiares por escalões de rendimento: IRS Modelo 1 + 2" from Pordata (2019), a certified Portuguese database with accredited statistics. This information was later compared to the last question "*Do you own a private pension fund (fundo PPR)*", coded dichotomously: 1=Yes and 0=No.

4.) Results

In order to test the first hypothesis "***Millennials (Young working adults in Portugal) are more worried about their retirement income than older working individuals in Portugal***", age groups 2 and 3 from the dataset were used (*N*=180) to understand how people aged between 20 and 35 answered to the question "*Are you worried that your income in old age will not be adequate to cover your later years?*" (also referred as Level of Worriedness) compared to the people older than 35 years.

To compare the answers of both age groups, a Mann-Whitney (non-parametric) Test was performed since the central tendencies between two independent groups (Age and Level of Worriedness) is being compared. The Mann-Whitney U test (Appendix I) showed that there was not a significant difference (U =2887.5, p=.971) between the Level of Worriedness for the age group between 20 to 35 compared to the age group older than 35. The mean rank of the Level of Worriedness was 90.42 for the first age group compared to 90.75 for the second age group suggesting that there is not a significant difference between both groups.

In conclusion, since the Significance Value (p=.971) is greater than the value of the Alpha (=.05) the test is statistically insignificant and thus **Hypothesis I cannot be confirmed**.

Not being able to confirm the first hypothesis, there are other conclusions that can be driven taking into account the available data. Using the question 2.1. of the survey where respondents were asked "*Are you saving (or have you saved) in order to live comfortably in old age*" a cross table (Table 1) was designed in order better illustrate how the saving behavior changes within the two different age groups:

Table 1: Number and percentage of people saving per age category

			***Are you saving in order to live comfortably in old age*?**		Total
			No	Yes	
Age	Between 20-35 years	Count	92	46	138
		% within Age	66.7%	33.3%	100%
	More than 35 years	Count	16	26	42
		% within Age	38.1%	61.9%	100%
Total		Count	108	72	180
		% within Age	60%	60%	100%

Here, it is possible to visually demonstrate that **66.7%** of the people aged between 20 and 35 years do not save in order to live a comfortably in old age while only **38.1%** of people aged older than years do not save. To statistically measure the significance of this difference, a Cramer's V test was performed. The Significance Value of this test equals to p=.01 (and is smaller than Alpha = .05) and thus this test is statistically significant meaning that there is a correlation between both variable with an *Effect Size* equal to .247 (Appendix II). In other words, there is a significant difference between age groups and their respective behavior when it comes to saving in order to live comfortably in old age.

The next step in this analysis is to understand whether the second hypothesis "***financial and investment literacy is positively related to future saving and investment behavior (for young working adults in Portugal/Millennials)***" can be confirmed or not. For this analysis, only the data of people in the age category 2 (between 20 and 35 years) were considered, therefore being the number of valid responses equal to *N*=138.

Table 2: Descriptive statistics of the score values

	N	Minimum	Maximum	Mean	Std. Deviation
Financial Behavior Score	138	26.00	70.00	49.96	10.34
Financial Knowledge Score	138	8.00	22.00	17.38	2.99

Table 2 shows how the minimum score value for the Financial Behavior group is equal to 26 and that the mean value score corresponds to 49.96. On the other hand, for the Financial Knowledge group, the minimum score value is 8 and the mean score value is equal to 17.38. The discrepancy of these values can be explained by the different number and type of questions asked within the different groups. Hence, in the Financial Behavior group, it was possible to obtain more points than in the Financial Knowledge group.

To test the second hypothesis, a correlation test was performed in order to see whether the Financial Knowledge and Financial Behavior are somehow correlated with each other. Since both variables correspond to natural and metric numbers (score values), a Pearson Correlation test was performed.

Table 3: Pearson correlation test

		Financial Behavior Score	Financial Knowledge Score
Financial Behavior Score	Pearson Correlation	1	.045
	Sig. (2-tailed)		.604
	N	138	138

The results can be seen in Table 3 and it is possible to retrieve that the Significance Value (p=.604) is greater than the Alpha and therefore the test is statistically insignificant. Hence,

Hypothesis II cannot be confirmed.

Nevertheless, the second step when analyzing the data was to understand whether the scores of both groups are normally distributed or not to understand whether income has influence on the different scores obtained in both groups (Financial Knowledge and Financial Behavior). To test this, a Shapiro-Wilk test of normality was performed on both variables (Appendix III). Since the Significance Value of the Financial Knowledge (p=.00) is lower than the value of the Alpha (.05), the variable is not normally distributed. For the Financial Behavior, the Significance Value (p=.114) is greater than the Alpha and the variable is normally distributed.

Since the Financial Knowledge variable is not normally distributed, a parametric test known as Kruskal Wallis test was performed in order to assess whether the Financial Knowledge score differs within the income groups. The results of this test (Appendix IV) show that the test is statistically relevant since the Significance Value (p=.000) is smaller than Alpha (.05) and hence there is a significant difference between income and Financial Knowledge. Moreover, due to the fact that Financial Behavior is normally distributed, it is necessary to perform a One-Way Anova to understand if there is a difference in the Financial Behavior score within the income groups. The results of this test show that the Significance Value (p=.02) is smaller than the Alpha (.05) and hence the test is statistically relevant (Appendix V). In other words, there is a significant difference in the Financial Behavior score within the different income groups.

In conclusion, it is possible to state that different income groups had different performances regarding both Financial Knowledge and Financial Behavior.

Lastly, to test the third hypothesis, it is important to understand whether "***the income level is positively related to the participation in private pension schemes in young working adults in Portugal/Millennials***" and thus see if the gross annual income of individuals has an effect on the private saving behavior. For this analysis, a cross table (Appendix VI) was

developed to understand how different income categories responded to the last question "*Do you own a private pension fund (fundo PPR)?*" (coded dichotomously as 0=No and 1=Yes). The table shows how different income groups responded differently to the same question. In the three lowest income groups (0-5.000; 5.001-10.000; 10.001-13.500), almost 90% of the individuals responded that they did not own a private pension fund. On the other hand, the three highest income groups had a higher participation value meaning that, on average, 60% of the participants owned a private pension fund. In order to test if this pattern is statistically significant, a Cramer's V test was performed.

Table 4: Symmetric Measures – Cramer's V test

		Value	**Approximate Sig.**
Nominal by Nominal	Phi	.348	.033
	Cramer's V	.348	.033
	Contingency Coefficient	.329	.033

The results can be seen above in Table 4 and show that the Significance Value (p=.033) is smaller than the Alpha (0,05) meaning that the test is statistically significant and that there is a positive correlation (effect size=.348) between income and participation in private pension funds. Hence, **hypothesis III can be confirmed**.

5.) Discussion

Overall, the aim of this study is to evaluate if young adults in Portugal are worried about their income during retirement and to which extent, they are taking active steps to prepare for it. In a closer examination, this paper also tries to understand the alliance between Financial Knowledge and Financial Behavior - whether knowledge about financial concepts makes individuals more cautious about their spending - and the role of income in the participation of private pension funds. Findings suggest that working Millennials in Portugal are equally worried about their disposable income in old years compared to older adults, that Financial

Knowledge does not significantly influence the Financial Behavior, and that participation in private pension schemes is positively correlated to the annual gross income of Portuguese Millennials.

5.1) Theoretical Implications:

In general terms, it is possible to conclude with the data that both age categories are equally concerned about their retirement income in the future. This statement contradicts a previous study that demonstrated how retirement and income worries tend to be higher in younger adults when compared to older individuals (Hayslip et al., 1997) and studies that defend that income worries tend be higher among more vulnerable populations like older individuals (Hershey et al., 2010). However, regarding the level of worriedness (mean score value = 6.23), the results of this study confirm the research of Hershey et al., (2010) and place Portugal among the three most worried countries in Europe, together with Poland and Bulgaria. In line with the same study, this level of worriedness does not seem to be enough to make people actively save for their retirement. Only 40% of the individuals reported that they were actively saving to live comfortably in old age. Once again, results are in line with Hershey et al., (2010) and place Portugal in a lower rank next to countries like Cyprus, Finland and Poland. Nevertheless, and in addition to past research, this study has proven that age influences the way individual's save for retirement since 66.7% of the young Portuguese adults do not save when compared to 38,1% of the older individuals.

The second part of this research focused solely on the data of working people aged between 20 and 35 years to clarify the missing literature on young adults in this specific topic. Due to the existing research about Financial Knowledge and its influence on Financial Behavior in older populations, the initial belief was that Financial Knowledge would somehow influence the Financial Behavior and retirement saving planning (Lusardi & Mitchell, 2011;

Fernández-López et al., 2010). However, this study demonstrated that, within the category of "young working adults in Portugal" also referred to as Millennials, Financial Knowledge is poorly related to any positive or negative outcome regarding Financial Planning. These results complement past research (Jones, 2005) that showed a weak relationship between both variables, in samples of young adults (and students) and that other variables, for instance goals, are determinant in the way Financial Knowledge and Behavior relate to each other (Boisclair et al., 2015). Other factors like personal characteristics can also influence the way individuals plan for their retirement (Drever et al. 2015) and might explain why no direct relationship between financial planning and behavior could be deducted.

The results of the present survey also gave the opportunity to further analyze some topics that were not directly involved with the initial hypothesis. After rejecting the second hypothesis, it was crucial to understand if the annual income had influence on the level of Financial Knowledge or Financial Behavior. Our first results suggest that income has indeed an influence in both test scores. Regarding Financial Knowledge, in appendix VII, it is possible to highlight that the two highest income groups correspond to the highest Financial Knowledge score. Nevertheless, the remaining income groups do not show a clear pattern. A possible explanation for this phenomenon might be found in the demographic nature of the sample. Having a sample with young adults - where presumably many just started they careers and earn entry-level wages - might explain why in some lower income categories the score is higher than in some middle-high income categories. Regarding the Financial Behavior, in fact, appendix XIII proves that the wealthiest income group corresponds to the greatest score. This result is in line with past research by proving that higher income is associated with higher levels of savings and investment due to the amount of available resources (Ares et al., 2015). However, just like in the relationship between income and Financial Knowledge, lower income groups also show a relative high score value compared to higher income groups. Once again,

the demographic nature of the sample can be a possible explanation for this phenomenon since young adults often have to be more conscious about their expenditures due to their lower wages.

Finally, the purpose of the third hypothesis was to understand whether income played a role in the participation of private pension funds (PPRs) in young working adults in Portugal. The cross table shown on appendix VI exhibits how participation increases with income, mostly after the barrier of a gross annual income of 27.500 Euros is surpassed. This information is in agreement with past studies defending that income is a key driver for participation in private pension funds (Cappelletti et al., 2012; Foster & Smetherham 2013). In this case, a possible explanation for this trend can be the fiscal benefits that private pension funds provide to individuals with higher levels of income (Lum & Lightfoot, 2010) also in younger generations. In a more subjective approach, the increase of participation in private pension funds among higher income-earning individuals is also related to an individual's age. Different studies have proven that the adherence to these funds is positively related to the age (Foster & Smetherham 2013; Vivel-Búa et al. 2019) and the number of years they have discounted for social security (Torricelli et al. 2016). Since in Portugal, ordinarily speaking, the annual income tends to increase with an individual's age (Eurostat, 2019a), it is possible to deduct another reason as why, in this research, income is positively correlated to the participation in private pension funds.

5.2) Managerial Implications:

Accurate financial planning and preparation for retirement is a process that requires extensive knowledge of the complex social security system (Lusardi & Mitchell, 2011) where individuals have to take decisions today that will significantly affect their financial status tomorrow. Portugal is a country where the public pensions system plays an essential role (Ares et al. 2015) and where supplementary pensions systems are still underdeveloped (Vivel-Búa et al. 2019). Hence, policymakers should develop free coaching programs that inform young

adults about the prospects of the social security system in Portugal in the next decades and that clarify about the advantages of private pension funds and individual saving. These programs already exist in countries like Germany and are aimed at a younger audience to help them understand day-to-day life topics such as taxes and pension planning. Perhaps government subsidized programs could help reducing the level of worriedness and anxiety regarding the future of pensions systems and transform it into concrete actions in the Portuguese society.

On the other hand, private companies in Portugal should use this worriedness to lure young individuals into their organization by offering complimentary company pension funds (PPRs Empresa) as part of their corporate benefits during the recruitment process and create awareness regarding this topic. These funds not only have fiscal advantages for the organization, but also for the employees as they can adjust the amount they invest according to their financial resources. In addition, considering the existing employees of an organization, these private pension funds may increase employee retention and set the company aside from the competition.

Lastly, companies would also benefit by introducing the concept of a profit-sharing pension plan widely used in the United States. In this plan, employee's retirement is linked to the overall profits of the company and can motivate workers to go an extra mile as their retirement benefits are directly linked to the performance of the company.

5.3) Limitations and Future Research:

Finally, it is important to discuss the limitations of the present study: The nature of the sample consists a limitation since only 180 from a total of 296 answers were valid. Furthermore, due to the distribution channels of the questionnaire, research was carried out on an unrepresentative sample, where higher educated young people, with a degree in finance/economics/management, most likely represented the majority of the second age category (20 to 35 years). In addition, there was a discrepancy between age categories since

76.7% of the valid answers belonged to age category 2 and only 23.3% correspond to age category 3 (older than 35 years). Compared to other studies in this field, this paper has not the same power of generalization due to the small sample size.

When excluding age group 3 (N=138) and researching whether income plays a role on the score of both, Financial Knowledge and Financial Behavior, only a few respondents had an average annual gross income higher than 27.501 Euros, while lower income categories had significantly more respondents. The same issue was verified when testing the third hypotheses, meaning that for higher income categories, a low representative value is expected.

For future researches, bigger samples with a greater variety of geographical, socioeconomic and demographic factors should be considered to guarantee a more representative and unbiased sample. Future studies should also try to understand the underlying reasons why young working adults are failing to plan for their retirement. Is it an economic or behavioral issue that makes Portugal one of the countries in Europe with the lowest saving rates (Eurostat, 2019b)? Finally, since this study has failed to prove that Financial Knowledge has an influence on the Financial Behavior of young working individuals, it is also important to understand whether practical financial experience has influence on the Financial Behavior, similarly to previous studies who have focused on young adults in other countries (Bačová et al., 2017).

6.) Conclusion

The aim of this study is to understand whether Portuguese Millennials are worried about their retirement income in the future and to which extend income and Financial Knowledge play a role in taking active steps to prepare for retirement. The present findings suggest that working Millennials in Portugal are as equally worried about their disposable income in old years as older adults, and that Financial Knowledge does not influence the Financial Behavior - proclivity to save money-. It was interesting to notice the influence of income on the Financial

Knowledge's and Behavior's scores. Finally, this study also verified that involvement in private retirement funds is positively correlated to the annual gross income. The Government should focus on developing programs that inform young adults about the prospects of the public social security system and corporations should take advantages of the level of worriedness amongst Millennials to attract people into their organizations. Lastly, prospects regarding this topic are rather pessimistic and previous studies have shown that active planning for retirement is effective, since individuals who plan and prepare themselves tend to end their active working life with three times the amount of net worth compared to non-planners (Lusardi & Mitchell, 2011).

7.) References

Agregados familiares por escalões de rendimento IRS Modelo 1-2. 2019. Retrieved 28 November 2019, from https://www.pordata.pt/Portugal/Agregados+familiares+por+escal%C3%B5es+de+rendimento+IRS+Modelo+1++2-79

Ares, Lucía., López, Sara., & Búa, Milagros. 2015. "The determinants of privately saving for retirement: the cases of Portugal and Spain." *European Journal of Applied Business Management*, 1 (1), 69-92.

Bačová, Viera., Dudeková, Katarína., Kostovičová, Lenka., & Baláž, Vladimir. 2017. "Financial planning for retirement in young adults: Interaction of professional experience, knowledge, and beliefs." *Studia Psychologica*, 59(2), 84-99.

Blank, Emily. 1999. "Pension Type and Retirement Wealth." *Industrial Relations: A Journal Of Economy And Society*, 38(1), 1-10.

Boisclair, David., Lusardi, Annamaria., & Michaud, Pierre-Carl. 2015. "Financial literacy and retirement planning in Canada." *Journal Of Pension Economics And Finance*, 16(3), 277-296. doi: 10.1017/s1474747215000311

Cappelletti, Giuseppe., Guazzarotti, Giovanni., & Tommasino, Pietro. 2012. "What Determines Annuity Demand at Retirement?" *The Geneva Papers On Risk And Insurance - Issues And Practice*, 38(4), 777-802.

Catalán, Mario., Guajardo, Jaime., & Hoffmaister, Alexander. 2009. "Coping with Spain's aging: retirement rules and incentives." *Journal of Pension Economics and Finance*, 9(4), pp.549-581.

Cebulla, Andreas., & Wilkinson, David. 2019. “Responses to an Ageing Workforce: Germany, Spain, the United Kingdom.” *Business Systems Research Journal*, 10(1), 120-137.

Chand, Masud., & Markova, Gergana. 2018. “The European Union's aging population: Challenges for human resource management.” *Thunderbird International Business Review*, 61(3), 519-529.

Clark, Robert., & Newhouse, Joseph. 2016. “Challenges facing public retirement plans.” *Journal Of Pension Economics And Finance*, *15*(3), 249-253.

Cooper, Richard., & Keynes, John. 1997. “The General Theory of Employment, Money, and Interest.” *Foreign Affairs*, 76(5), 217.

Croy, G., Gerrans, P., & Speelman, C. 2010. “The role and relevance of domain knowledge, perceptions of planning importance, and risk tolerance in predicting savings intentions.” *Journal Of Economic Psychology*, 31(6), 860-871.

Drever, Anita., Odders-White, Elizabeth., Kalish, Charles., Else-Quest, Nicole., Hoagland, Emily., & Nelms, Emory. 2015. “Foundations of Financial Well-Being: Insights into the Role of Executive Function, Financial Socialization, and Experience-Based Learning in Childhood and Youth.” *Journal Of Consumer Affairs*, 49(1), 13-38.

Ekerdt, David., Hackney, Jennifer., Kosloski, Karl., & DeViney, Stanley. 2001. “Eddies in the stream: the prevalence of uncertain plans for retirement.” *Journals of Gerontology Social Sciences*, 56B, S162–S170.

European Union. 2018. “The 2018 Ageing Report: Economic and Budgetary Projections for the EU Member States (2016-2070).” Brussels. Available at: https://ec.europa.eu/info/publications/economy-finance/2018-ageing-reporteconomic-and-budgetary-projections-eu-member-states-2016-2070_en

Eurostat. 2019a. “Mean and median income by age and sex - EU-SILC and ECHP surveys”. Available at: appsso.eurostat.ec.europa.eu

Eurostat. 2019b. “Household saving rate”. Available at: https://ec.europa.eu/eurostat/databrowser/view/teina500/default/table?lang=en

Fernández-López, Sara., Otero, Luis., Vivel, Milagros., & Rodeiro, David. 2010. “What Are the Driving Forces of Individuals’ Retirement Savings?”. *Czech Journal of Economics and Finance*, 60, 226-251

Ferraro, Kenneth., & Su, Ya-ping. 1999. “Financial Strain, Social Relations, and Psychological Distress Among Older People: A Cross-Cultural Analysis.” *The Journals Of Gerontology Series B: Psychological Sciences And Social Sciences*, 54B(1), S3-S15.

Foster, Liam., & Smetherham, Jon. 2013. “Gender and Pensions: An Analysis of Factors Affecting Women's Private Pension Scheme Membership in the United Kingdom.” *Journal Of Aging & Social Policy*, 25(3), 197-217.

Godínez-Olivares, Humberto., Boado-Penas, María del Carmen., & Haberman, Steven. 2016. Optimal strategies for pay-as-you-go pension finance: A sustainability framework. Insurance: Mathematics And Economics, 69, 117-126.

Hayslip, Bert., Beyerlein, Michael., & Nichols, Judith. 1997. “Assessing Anxiety about Retirement: The Case of Academicians.” *The International Journal Of Aging And Human Development*, 44(1), 15-36.

Hershey, Douglas., Henkens, Kène., & van Dalen, Hendrik. 2010. “What drives retirement income worries in Europe? A multilevel analysis.” *European Journal Of Ageing*, *7*(4), 301-311.

Huberman, Gur., Iyengar, Sheena., & Jiang, Wei. 2007. “Defined Contribution Pension Plans: Determinants of Participation and Contributions Rates.” *Journal Of Financial Services Research*, 31(1), 1-32.

International Institute for Applied Systems Analysis (IIASA). 2018. “Aging Demographic Data Sheet 2018.” Austria. Available at: https://www.iiasa.ac.at/web/home/research/researchPrograms/WorldPopulation/News/180115-ADS.html

Jacobs-Lawson, Joy., & Hershey, Douglas. 2005. “Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviors.” *Financial Services Review*, 14, 331–344.

Jones, Joyce. 2005. “College Students' Knowledge and Use of Credit.” *Financial Counseling and Planning*, 16(2), 9–16.

Lum, Yat-Sang., & Lightfoot, Elizabeth. 2003. “The effect of health on retirement saving among older workers.” *Social Work Research*, 27(1), 31-44.

Lusardi, Annamaria., & Mitchell, Olivia. 2011. “Financial literacy and retirement planning in the United States.” *Journal Of Pension Economics And Finance*, 10(4), 509-525.

Mitchell, Oivia., & Moore, James. 1998. “Can Americans Afford to Retire? New Evidence on Retirement Saving Adequacy.” *The Journal Of Risk And Insurance*, 65(3), 371. doi: 10.2307/253656

Modigliani, Franco., Brumberg, Richard. 1954. “Utility Analysis and the consumption function: An interpretation of cross-section data”. New York: Rutgers University Press.

Moreira, Amílcar. 2019. “Sustentabilidade do sistema de pensões português.” Retrieved 28 October 2019, from https://www.ffms.pt/FileDownload/62281dcc-1734-403d-846e-c5b38bc8fa7e/resumo-do-estudo-sustentabilidade-do-sistema-de-pensoes-portugues

OECD. 2016. “PISA 2015 Results (Volume I): Excellence and Equity in Education”.*OECD Publishing*. Paris. http://dx.doi.org/10.1787/9789264266490-en

OECD INFE. 2011. “Measuring Financial Literacy: Core Questionnaire in Measuring Financial Literacy: Questionnaire and Guidance Notes for conducting an Internationally Comparable Survey of Financial literacy.” Paris: OECD.

Thévenot, Celine. 2017. “Inequality in OECD countries.” *Scandinavian Journal Of Public Health*, 45(18_suppl), 9-16.

Topa, Gabriela., & Herrador-Alcaide, Teresa. 2016. “Procrastination and financial planning for retirement: A moderated mediation analysis.” *Journal Of Neuroscience, Psychology, And Economics*, *9*(3-4), 169-181.

Torricelli, Costanza., Brancati, Maria., & Santantonio, Marco. 2016. “Does Homeownership Partly Explain Low Participation in Supplementary Pension Schemes?.” *Economic Notes*, 45(2), 179-203.

Van Rooij, Maarten., Lusardi, Annamaria., & Alessie, Rob. 2011. “Financial literacy and retirement planning in the Netherlands.” *Journal Of Economic Psychology*, 32(4), 593-608.

Vivel-Búa, Milagros., Rey-Ares, Lucía., Lado-Sestayo, Rubén., & Fernández-López, Sara. 2019. “Financial planning for retirement: the role of income.” *International Journal Of Bank Marketing*, 37(6), 1419-1440.

Wiatrowski, William. 1993. “Factors affecting retirement income.” *Monthly Labor Review*, 116, 25–35

8.) Complementary Appendixes

Appendix I: Mann-Whitney U test

Test Statistics[a]

	Are you worried that your income in old age will not be adequate to cover your later years?
Mann-Whitney U	2887,50
Wilcoxon W	12478,5
Z	-,036
Asymp. Sig. (2-tailed)	,971

a. Grouping Variable: Age

Appendix II: Cramer's V test

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Phi	,247	,001
	Cramer's V	,247	,001
	Contingency Coefficient	,239	,001
N of Valid Cases		180	

Appendix III: Shapiro-Wilk test of normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Financial_Knowledge	,132	138	,000	,948	138	,000
Behaviour_Score	,061	138	,200*	,984	138	,114

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix IV: Kruskal Wallis test

Test Statistics[a,b]

	Financial_Knowledge
Chi-Square	28,432
df	8
Asymp. Sig.	,000

a. Kruskal Wallis Test

b. Grouping Variable: Income

Appendix V: One-Way Anova test:

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Financial_Knowledge	Between Groups	223,276	8	27,910	3,567	,001
	Within Groups	1009,369	129	7,825		
	Total	1232,645	137			
Behaviour_Score	Between Groups	1881,113	8	235,139	2,378	,020
	Within Groups	12754,626	129	98,873		
	Total	14635,739	137			

Appendix VI: Cross Table – Income x Private Pension

Income * Do you own a private pension fund (fundo PPR)? Crosstabulation

			Do you own a private pension fund (fundo PPR)?		
			No	Yes	Total
Income	0 – 5.000	Count	28	2	30
		% within Income	93,3%	6,7%	100,0%
	5.001 – 10.000	Count	28	4	32
		% within Income	87,5%	12,5%	100,0%
	10.001 – 13.500	Count	17	0	17
		% within Income	100,0%	0,0%	100,0%
	13.501 – 19.000	Count	31	1	32
		% within Income	96,9%	3,1%	100,0%
	19.001 – 27.500	Count	12	4	16
		% within Income	75,0%	25,0%	100,0%
	27.501 – 32.500	Count	2	1	3
		% within Income	66,7%	33,3%	100,0%
	32.501 – 40.000	Count	1	1	2
		% within Income	50,0%	50,0%	100,0%
	40.001 – 50.000	Count	3	1	4
		% within Income	75,0%	25,0%	100,0%
	50.001 – 100.000	Count	1	1	2
		% within Income	50,0%	50,0%	100,0%
Total		Count	123	15	138
		% within Income	89,1%	10,9%	100,0%

Appendix VII: Mean Financial Knowledge rank according to Income group

Ranks

	Income	N	Mean Rank
Financial_Knowledge	0 – 5.000	30	57,60
	5.001 – 10.000	32	54,92
	10.001 – 13.500	17	66,26
	13.501 – 19.000	32	74,31
	19.001 – 27.500	16	97,31
	27.501 – 32.500	3	51,83
	32.501 – 40.000	2	65,25
	40.001 – 50.000	4	130,25
	50.001 – 100.000	2	118,50
	Total	138	

Appendix VIII: Mean Financial Behavior rank according to Income group

Ranks

	Income	N	Mean Rank
Behaviour_Score	0 – 5.000	30	76,87
	5.001 – 10.000	32	60,31
	10.001 – 13.500	17	58,35
	13.501 – 19.000	32	68,47
	19.001 – 27.500	16	97,72
	27.501 – 32.500	3	38,83
	32.501 – 40.000	2	73,50
	40.001 – 50.000	4	32,50
	50.001 – 100.000	2	107,50
	Total	138	

Appendix IV: Survey

Q1: Are you currently employed, or have you been employed in the past twelve months?

- Answers: Yes / No
- End survey if answer=No

Q1.1: Your current age is:

- Answers: Less than 20 years / Between 20 and 35 years /More than 35 years
- End survey if answer=Less than 20 years
- Answers: 0 - 5.000 / 5.001 - 10.000 / 10.001 - 13.500 / 13.501 - 19.000 / 19.001 - 27.500 / 27.501 - 32.500 / 32.501 - 40.000 / 40.001 - 50.000 / 50.001 - 100.000 / 100.001 - 250.000 / 251.000 +

Q2: Are you worried that your income in old age will not be adequate to cover your later years?

- Answers: 11-point scale (0=Not at all worried; 10=Extremely worried)

Q2.1: Are you saving (or have you saved) in order to live comfortably in old age?

- Answers: Yes / No

Financial Knowledge test:

Q3.1: Have you heard of these financial products (A pension fund; An investment account; A mortgage; A bank loan secured on property; An unsecured bank loan; A credit card;
A "current" account; A savings account; A microfinance loan; Insurance; Stocks and shares; Bonds; Mobile phone payment account; Prepaid payment card)?

- Answers: Yes / No

Q3.3: Imagine that five brothers are given a gift of $ 1,000. If they have to share the money equally, how much does each one gets? (Please give an entire **numerical** answer without any symbols e.g. 5)

- Correct Answer: 200

Q3.4: Now imagine that the brothers have to wait for one year to get their share of the $1,000 and inflation stays at 10% percent. In one year's time will they be able to buy:

- Answers: More with their share of the money than they could today / The same amount / Less than they could buy today / It depends on the types of things that they want to buy / Do not know
- Correct Answer: Less than they could buy today

Q3.5: You lend $25 to a friend one evening and he gives you $25 back the next day. How much interest has he paid on this loan? (Please give an entire numerical answer without any symbols e.g. 5)

- Correct Answer: 0

Q3.6: Suppose you put $100 into a savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any

money. How much would be in the account at the end of the first year, once the interest payment is made? (Please give an entire numerical answer without any symbols e.g. 5)

- Correct Answer: 102

Q3.7: And how much would be in the account at the end of five years remembering there are no fees?

- Answers: More than $110 / Exactly $110 / Less than $110 / Impossible to tell from the information given / Don't know
- Correct Answer: More than $110

Please state whether the following statements are **true**, **false** or **neither true nor false**:

Q3.8: "An investment with a high return is likely to be high risk"

- Answers: True / Neither true nor false / False
- Correct Answer: Ture

Q3.9: "High inflation means that the cost of living is increasing rapidly"

- Answers: True / Neither true nor false / False
- Correct Answer: Ture

Q3.9.1: "It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares"

- Answers: True / Neither true nor false / False
- Correct Answer: Ture

Financial Behavior:

Please state whether you **agree** or **disagree** with the following statements:

Q4.1: “Before I buy something, I carefully consider whether I can afford it”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Q4.2: “I tend to live for today and let tomorrow take care of itself”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Q4.3: “I find it more satisfying to spend money than to save it for the long term”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Q4.4: “I pay my bills on time”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Q4.5: “I keep a close personal watch on my financial affairs”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Q4.6: “I am prepared to risk some of my own money when saving or making an investment”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Q4.7: “I set long term financial goals and strive to achieve them”

- Answer: Rating on a 11-point scale (0=Completely disagree; 10=Completely agree)

Private Pension Funds:

Q5: Finally, do you own a private pension fund (fundo PPR)?

- Answers: Yes / No