
Is the Belgian youth ready to save for retirement under a defined contribution pension system?¹

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Abstract – *The paper analyses levels of financial literacy among university students in a Belgian University and links them to their retirement savings preferences based a logit model of data collected through a survey. Both dimensions are crucial since a reform of the pension system has increased the importance of individual retirement savings decisions at an early age. We find that financial literacy is relatively high in our sample but that there is heterogeneity in how it impacts savings for retirement decisions, driven by socio-demographic dimensions. Some groups are clearly at risk of not saving enough under the new pension system, including among the highly financially literate population.*

Keywords: *financial literacy, retirement savings, savings decisions, students*

JEL Classification: *A20, D14, E21, H3, H53, J26*

1 INTRODUCTION

The main purposes of this paper are to: (i) analyse financial literacy among the young in Belgium, and (ii) assess whether this literacy is sufficient to allow them to make sound retirement savings decisions. As most European governments, Belgium is progressively shifting from defined benefit (DB) to defined contribution (DC) pension plans (Commission de réforme des pensions 2020-2040, 2014). The optimization of the opportunities allowed by the shift requires higher levels of understanding of basic concepts and of financial literacy than the DB ever required.² Yet, there is no evidence that the concerned population, the younger one, is equipped to take on the challenges.

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1. We are grateful to G. Kirchsteiger and P. Francotte for comments and discussions. Any remaining mistake is ours and ours only.
2. Belgians are given incentives to rely on complementary pensions schemes organized by an employer or at the sector level through tax incentives. The employee usually picks between two options:

Defined contribution plans require people to decide on savings levels and uses, in order not to outlive their assets once retired (Lusardi and Mitchell, 2014). This could be a challenge for those without a sufficient knowledge of basic financial concepts. Indeed, these plans require savers to understand the financial and longevity risks they need to take on as they make their savings decisions (European Commission, 2010). A lack of adequate knowledge with regard to the pension savings process, may lead people to make sub-optimal decisions, such as starting to save too late or insufficient amounts (Clark and d'Ambrosio, 2002). In short, financial illiteracy could lead to insufficient savings to ensure a comfortable retirement at old age (Lusardi, 2008).

To investigate how young individuals, think about money and savings, and how well they really understand the concepts underlying sound planning for retirement, we rely on a questionnaire sent to students at a Belgian University (Université libre de Bruxelles or ULB). The questionnaire is based on the findings of research conducted mainly in the U.S., Australia and a few European countries to assess financial literacy and its drivers among older workers close to retirement. The data collected is then used to analyse the relationship between financial literacy and socio-demographic characteristics of the sample and their attitude towards saving for retirement.

Focusing on university students, including in particular economics and business students, is a way of assessing the extent to which the social group most likely to be tooled enough to make the right decisions is financially literate enough to make the right savings decisions. It seems reasonable to assume that, if there is evidence that this population is not able of taking on the challenges, citizens with less formal analytical training would face at least equivalent challenges. From a policy perspective, this would make the case for general financial education programs.³

But there is more heterogeneity possible and this could also have policy implications. If knowledge differs across students types (i.e. with and without training in finance), there may also be a case for diversified rather than standardized financial literacy programs. Moreover, there is also no reason to assume that other dimensions such as socio-demographic, regional or national background may not matter to the design of these programs. These possible sources of difference are addressed as well. To ensure a proper diagnostic accounting for key control variables, the paper estimates a logit model of the drivers of the main policy concerns to be addressed from the sample collected. The model is similar to the approach followed by Alhenawi and Elkhal (2013).

The paper is organized as follows. Section 2 reviews the literature on the importance of financial literacy for retirement savings and on the methods used

(i) contribute a determined share of her/his salary to the plan and the number of years of contribution determine payments upon retirement (i.e. defined benefit plans) and (ii) freely picks the contribution rate and how her/his contributions are invested and the retirement benefits depend on the investment return but with a minimum guaranteed in the Belgian case (i.e. defined contribution plan).

3. The concerns for financial education are not new. The main options considered include financial education programs (Lusardi, 2008) or national strategies (Grifoni and Messy, 2012), peer information interventions (Bailey *et al.*, 2004; Beshears *et al.*, 2015; Duflo and Saez, 2002, 2003), or automatic enrolment (Choi *et al.*, 2001; Beshears *et al.*, 2006)

to draw conclusions. Section 3 describes in greater detail the methodology of the current study and provides basic statistics. Section 4 is dedicated to the econometric analysis. Section 5 concludes and provides a discussion on policy implications.

2 REVIEW OF THE LITERATURE ON FINANCIAL LITERACY OF THE YOUTH

The literature shows that, increasingly, around the world, working people need to decide on their own when to retire, how to save and how to invest. This fuels the risks of under-saving, investing unwisely and dis-saving too rapidly once retired (Lusardi, 2008, 2011b). It also increases the need for an adequate understanding of the increasingly complex products and services offered to ensure sound retirement planning. Most researchers adopt a similar definition of the financial literacy needed. It is nicely synthesized by Hung *et al.* (2009) as follows: “*Knowledge of basic economic and financial concepts, as well as the ability to use that knowledge and other financial skills to manage financial resources effectively for a lifetime of financial well-being*”.

In the context of retirement savings, much of the evidence highlights a close link between financial literacy and retirement planning (Bucher-Koenen and Lusardi, 2011; Lusardi, 2008; Lusardi and Mitchell, 2006a, 2006b, 2009; Van Rooij *et al.*, 2009), as well as between financial literacy and wealth accumulation at old age (Behrman *et al.*, 2012; Lusardi, 2008; Lusardi and Mitchell, 2006a; Van Rooij *et al.*, 2012). The main results show that less financially literate individuals are not only more likely to make poor decisions (Lusardi and Tufano, 2009) but also that they are less likely to participate in financial markets and mortgage borrowing (Brown and Graf, 2013; Van Rooij *et al.*, 2007).

There are national specificities with respect to financial illiteracy and lack of planning. Using the same financial literacy questions as Lusardi and Mitchell (2006b), Brown and Graf (2013) find that, although still low, levels of financial literacy are relatively higher in Switzerland than in the US and similar to those found by Bucher-Koenen *et al.* (2011) for Germany and by Alessie *et al.* (2011) for the Netherlands. Some studies also point out regional differences within a specific country (see for instance Bucher-Koenen *et al.* (2011) for differences between East and West Germany or Fornero and Monticone (2011) for regional differences in Italy)). For Switzerland, Brown and Graf (2013) find that while 52% of Swiss citizens could answer all the basic questions correctly, no more than 34% for foreign citizens living in Switzerland.

The only study with a detailed assessment of the levels of financial literacy of young Belgians, was fielded in 2012 by the OECD’s PISA. It focused on high school students at age 15 to 18 in different countries and analysed the factors associated with higher financial literacy (Mitchell and Lusardi, 2015). In this assessment, Belgian students performed significantly better than the OECD average. The OECD’s PISA study however focuses only on the Flemish Community (OECD, 2014).

Research also shows that age, education and income level also matter. There is evidence of a hump-shaped relationship between financial knowledge and age (i.e. the younger and older employees are less knowledgeable on basic financial concepts as are middle-aged individuals). Individuals with lower education or lower income display lower financial literacy than those with higher education or higher incomes (e.g. Bucher-Koenen and Lusardi, 2011; Brown and Graf, 2013; Fornero and Monticone, 2011; Lusardi, 2011a; Lusardi and Mitchell, 2007, 2009, 2011a; Moore, 2003; Van Rooij *et al.*, 2009, Lusardi, 2015).

Finally, gender matters. Women have displayed relatively lower levels of financial literacy than men in many countries (e.g. Bucher-Koenen *et al.*, 2012; Brown and Graf, 2013; Fornero and Monticone, 2011; Lusardi and Mitchell, 2011a; Millar and Devonish, 2009; Yu *et al.*, 2015). Russia is a notable exemption since no gender gap has been found (Klapper and Panos, 2011).

With respect to the young specifically, a few more insights are available. The first is the strong relationship between the education of parents, and their children's financial literacy. Lusardi *et al.* (2009b) find that respondents, whose mother graduated from college, had significantly higher correct response rates. Second, children who discuss with parents or teachers about money matters were more likely to have higher financial literacy scores (Ali *et al.*, 2014) or to display healthier approaches towards financial matters (Jorgensen and Savler, 2015). And third, although gender differences in financial literacy may not be that pronounced during high school (Ali *et al.*, 2014; Lusardi, 2015; Mandell, 2008), Lusardi *et al.* (2009b) find evidence for a significant gender gap also among the young aged 23-28.

With respect to methodological approaches, most of the studies rely on three questions on fundamental concepts related to inflation, risk diversification and interest compounding developed by Lusardi *et al.* (2006a, 2006b) as well as on a self-assessed financial knowledge question (Bucher-Koenen *et al.* 2011; Fornero *et al.*, 2011; Lusardi and Mitchell, 2009, 2011a; Lusardi *et al.*, 2009b; Van Rooij *et al.*, 2009). Some complemented these "basic financial knowledge" questions with more sophisticated financial literacy questions (see for instance Lusardi *et al.*, 2009a; Van Rooij *et al.*, 2009). Whereas these survey questionnaires can be answered rather quickly, other studies also developed more lengthy financial literacy surveys (see for instance Hilgert *et al.*, 2003; Lusardi, 2015; Moore, 2003).

3 METHODOLOGY, DATA AND BASIC STATISTICS

The review of the literature guided the questionnaire used to collect data to assess financial literacy among the youth. We added two dimensions to the many suggested by prior research. First, we focused on the youth group expected to have the best training to make sound financial decisions, namely university students. The idea was that if there is a problem in the best educated group, the rest of the population is likely to be in worse shape. Second, within this group, we accounted for possible distortions in literacy anchored in the choice of studies. This leads us to distinguish between those with an economics/business training and the others. Section 3.1 explains the survey design. Section 3.2 is a snapshot of differences observed in financial literacy.

3.1 Survey Design and Analysis

The information was collected through a self-administered online survey relying on the online program *Google Forms*. The use of an online survey allows respondents to reflect before giving an answer (Lusardi and Mitchell, 2009). We placed no time limit on the time allowed to think through the question.

The questionnaire was sent to students of different departments in one of the main francophone Belgian universities by mail or through Facebook groups and random messages between January and the beginning of March 2015. A small text explained that the survey is anonymous and that its completion does not require more than 10 minutes. No financial incentive was offered.

The survey was designed to capture both attitudes and factual information. It was organized in four parts: (i) a test of the preferences for choices available under complementary pensions; (ii) an objective test of financial literacy needed to make retirement planning decisions; (iii) a subjective self-assessment test of financial literacy; and (iv) personal and demographic data to be used as control variable.

The first test is based on Bailey *et al.* (2004) in the US and aims to capture respondents' attitudes towards saving for retirement. The exact wording of the scenario is the following:

Imagine that you are graduating next summer and start working for a company with an average annual salary of 40 000€. The company you are working for is offering you the following retirement saving options:

OPTION_1: *Either you will be given the possibility to choose to contribute a determined percentage of your salary and that the benefits you receive will be calculated based on the number of years of contribution.*

OPTION_2: *Or, you can determine which percentage to contribute as well as on how these contributions will be invested by the employer. In this case, the benefits you receive during retirement will depend on the return of your investment choice.*

The second test consists in five financial literacy questions on different concepts fundamental for sound retirement planning. Three questions are based on the basic financial literacy questions designed by Lusardi and Mitchell (2006a; 2006b) and aim to capture respondents' understanding of the concepts of inflation, risk diversification and interest compounding. The exact wording of the questions is the following:

Imagine that you currently perceive a 1% interest rate on your savings account and that inflation is currently at 2% per year. At the end of the year, you can:

(a) Buy less than today; (b) Buy more than today; (c) Buy exactly the same than today; and (d) Do not know

Please indicate if the following statement is true or false: "Investing all one's savings in a single company stock is safer than investing one's savings in a stock mutual fund?"

(a) Yes; (b) No; and (c) Do not know

Imagine that you currently have €200 in your savings account and that you perceive a 10% interest per year. How much will you have in your savings account after two years if you leave the money untouched?

(a) Less than €220; (b) More than €220; (c) Exactly €220; (d) Do not know

As adequate financial decision-making requires knowledge also on other concepts, two additional questions have been included in the survey instrument. Whereas, the first question is based on a question asked by Byrne (2004) and is related to the inverse relationship between bond prices and interest rates, the second is suggested by Lusardi and Tufano (2009) and aims to investigate respondents' understanding of interest calculations and debt. The precise wording of the questions is the following:

What is the impact of an increase in long-term interest rates on bond prices?

(a) An increase in long-term interest rates will lead to a decrease in bond prices; (b) An increase in long-term interest rates will lead to an increase in bond prices; (c) There is no relationship between bond prices and long-term interest rates; and (d) Do not know

Imagine that you borrowed €2 000 on your credit card and that the interest rate you need to pay on your debt is 12% per year (1% per month). If you pay back €20 per month, how many years will it take you to completely repay this debt?

(a) Less than 5 years; (b) 5-10 years; (c) 10-20 years; (d) Never; (e) Do not know

The third survey component is a rough self-assessment of knowledge and attitudes towards saving. Respondents are asked to rank their opinions on a 4-point Likert-scale ranging from 1 (I strongly disagree) to 4 (I strongly agree). The 4-point Likert-scale avoids survey participants to stick to a mid-point.

Finally, the last part of the survey collects demographic characteristics of respondents such as age, gender, field of studies, marital status, etc. It also includes a question on parental occupation and schooling and on who they currently ask for financial advice.

3.2 Main Aggregate Survey Data

Table 1 here summarizes the socio-demographic characteristics of sample respondents and shows that 149 responses have been collected. The average age is 23.5 years and the distribution ranges from 18 to 37 years. Female students represent 40.3% of the sample. About half of the sample (52.35%) had their secondary education in Belgium. Most are currently studying economics (75.17%) and are in a master's degree (80.54%). Over 20% already had some work experience (i.e. up to five years) and 7.38% have more paid work experience. While 42.95% of survey respondents are living with their family, two-fifths are currently living in a shared flat and 16.78% are living alone.

Table 1. Summary Statistics

	Number of respondents	Mean	Standard deviation
Age (years of age)	149	23.5	2.1736
Female	69	40.30%	0.5003
Secondary Education in Belgium	78	52.35%	0.5011
Economics Student	112	75.17%	0.4335
Academic Year			
BA	23	15.44%	0.3625
MA1	49	32.89%	0.4714
MA2+	77	51.68%	0.5014
Marital Status			
Single	143	95.97%	0.1973
Married	5	3.36%	0.1807
Separated	1	0.67%	0.0819
Housing Situation			
Live alone	25	16.78%	0.3749
Live in a flat share with other people	60	40.27%	0.4921
Live with family	64	42.95%	0.4967
Belgian Region			
Brussels	87	58.39%	0.4946
Belgium other than Brussels	33	22.15%	0.4167
Not in BE	29	19.46%	0.3973
Student Occupation			
Only focusing on studies	104	69.80%	0.4607
Working	13	8.72%	0.2832
Working part-time	19	12.75%	0.3347
Student job	13	8.72%	0.2832
Student Experience			
<1year	105	70.47%	0.4577
1-5years	33	22.15%	0.4166
>5years	11	7.38%	0.2624
Parent Degree			
Secondary school or less	44	30.20%	0.4607
Bachelor	29	19.46%	0.3973
Master	61	40.94%	0.4934
PhD	15	10.07%	0.3019

3.3 How Much do Students Know About Basic Financial Concepts?

Table 2 reveals a strong understanding of the meaning of inflation, diversification and compound interest, but also a much more modest understanding of bond prices and interest and of debt. A large share recognized they did not know the answer to 4 of the related 5 questions. The drop in correct response rates for the question on bonds echoes the results of studies conducted in the Netherlands and US (Lusardi and Mitchell, 2009; Lusardi and Tufano, 2009; Van Rooij *et al.* (2007)).

Table 2. Percentage of Correct, Incorrect and 'Do not know' answers per question

Topic	Correct	Incorrect	Do not know
Inflation	78.52%	8.72%	12.75%
Diversification	89.93%	0.67%	9.40%
Compound Interest	93.96%	6.04%	0.00%
Bond Prices and Interest Rates	55.03%	26.85%	18.12%
Debt	32.21%	59.73%	8.05%

Total number of observations (N): 149

Overall, our results are consistent with the findings that individuals with higher educational attainment score higher on financial literacy questions by Lusardi *et al.* (2009b) for the US youth. Even if higher education does not guarantee good knowledge as suggested by de Bassa Scheresberg (2013) who finds for a sample of young US adults aged 25-34 that only 60% of respondents with postgraduate education could correctly respond to three similar financial literacy questions. Our results are also in line with the 2012 OECD's PISA assessment of financial literacy, for which the Flemish Community was among the top-performers (OECD, 2014). The next step is an assessment of the influence of this knowledge, including its limitations and its heterogeneity, on the key retirement savings decisions.

4 ECONOMETRIC ANALYSIS

To see how the key socio-demographic, regional and educational variables influence the key policy concerns, we rely on 4 econometric estimations of logit models specified to answer separately each the following specific questions:

- (a) Which students are more likely to be more financially literate?
- (b) Which students are more likely to think more about saving for retirement?
- (c) Which pension plan would which student be more likely to use?
- (d) How much would which student contribute to their pension plans?

The questionnaire includes a variable, which can be used as a “left-hand side or explained” (y_t) variable for each of these questions. To account for all the variables of interest suggested by the literature survey, we rely on the following general model:

$$\text{logit}(y_i) = \beta_0 + \beta_1(\text{Female})_i + \beta_2(\text{Secondary education in Belgium})_i + \beta_3(\text{MA2+})_i + \beta_4(\text{Economics student})_i + \beta_5(\text{Live with their family})_i + \beta_6(\text{Working part-time})_i + \beta_7(\text{Parent higher education})_i$$

The independent variables included as dummy variables are: *gender* ($\text{Female}_i = 1$ if respondent i is female; 0 otherwise), *secondary education in Belgium* ($\text{Secondary education in Belgium}_i = 1$ if respondent i had her/his secondary education in Belgium; 0 otherwise), *economics student* ($\text{Economics student}_i = 1$ if respondent i is studying economics; 0 otherwise), *academic year* ($\text{MA2+} = 1$ if respondent i is currently in the second year of her/his master’s degree or doing a PhD), *housing situation* ($\text{Live with their family}_i = 1$ if respondent i lives with his parents or his partner; 0 otherwise), *student occupation* ($\text{Working part-time}_i = 1$ if respondent i is working part-time or has a student job; 0 otherwise), and *parent degree* ($\text{Parent higher education}_i = 1$ if at least one of respondent i ’s parents has at least a bachelor’s degree; 0 otherwise). In a second stage, we also add a financial literacy measure as a predictor variable.

Rather than reporting the estimates with respect to a base category, following Lusardi and Tufano (2009), marginal effects are determined. The tables of this section report the logit marginal effects of association with high financial literacy as well as the usual tests. To test the explanatory power of the models, likelihood-ratio chi-square test statistics have been performed and associated p-values determined. For each of the models, the associated p-value is below 0.1, leading to the rejection of the null-hypothesis of all slope-coefficients of the model being equal to 0 at a 10% significance level.

4.1 Which Students Know Best?

Following Agnew *et al.* (2007), a binary financial literacy variable has been created based on a mean split (mean of correct answers = 3.5). Thus, respondents scoring 4 or more are considered as «highly financially literate» whereas those scoring below are considered as «less financially literate». Constructing a binary variable based on a mean split allowed to divide the sample in more or less equal groups (approximately 58% highly financially literate and 42% less financially literate). The impact of the control variables on the level of financial literacy is reported in Table 3. The main results can be summarized as follows.

Gender has a significant impact. Whereas 68.75% of male answered correctly to four or more questions, only 46.38% of female respondents did so. This finding is validated by the logit we estimated (p -value = 0.052). It also confirms earlier results in the US, the Netherlands, Germany, or Italy (Beal and Delpachitra, 2003; Lusardi and Mitchell, 2006b; Van Rooij *et al.* 2009; Bucher-Koenen and Lusardi, 2011; Fornero and Monticone, 2011). All papers, including this one, point to a gender gap in financial literacy.

Table 3. Logit Marginal Effects of Association with High Financial Literacy

	High Financial Literacy
Female	-0.190*
	(0.098)
Secondary education in Belgium	-0.033
	(0.120)
MA2 +	0.210**
	(0.101)
Economics student	0.611***
	(0.143)
Live with their family	0.013
	(0.107)
Working part-time	-0.069
	(0.120)
Parent higher education	0.090
	(0.109)
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Log Likelihood	-77.04
Number of Observations	149
LR chi2(7)	48.25
Prob > chi2	0.0000
Pseudo R-squared	0.2385

Standard errors represented in parenthesis

Note: marginal effects calculated at the means of the independent variables

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$

High Financial Literacy has been defined as having 4 or more financial literacy questions correct

Education also matters but in various ways. Most of the common results from the literature have been validated by this sample but not all. The number of years the student spent at university significantly improves financial literacy levels (i.e. those in MA2 are more financially literate (p -value = 0.038), confirming the findings of previous studies on the positive impact of education on literacy level (see for instance Lusardi *et al.*, 2009b; and Van Rooij *et al.*, 2007). The relevance of the field of study in the Belgian sample validates Beal and Delpachitra (2003) and Frączek and Klimontowicz (2015) on the payoffs to studying economics in terms of financial literacy. Economics students were significantly more likely to answer correctly four or more questions (p -value = 0.000). Two common results from the literature are however not confirmed in our sample. Contrary to Lusardi

et al. (2009b) or Mandell (2008), there is no significant impact of the educational attainment of parents in this sample.

4.2 Which Students Think About Saving for Retirement?

A majority (71.81%) of respondents indicates to either think or strongly think about savings for retirement. This is a somewhat comforting result, as simple planning activities have been shown to increase implementation (Gollwitzer, 1999). Merely thinking about saving for retirement actually seems to lead to higher wealth during retirement (Lusardi and Mitchell (2014)).

Given the heterogeneity of the population in our sample, it seems useful to try to identify any difference between students in the extent to which they think about savings for retirement. To do so, we created a binary dependent variable (taking the value of 1 if the respondent mentioned to agree or strongly agree with the statement and 0 otherwise). The marginal effects of each of the possible choice drivers or population characteristics estimated from the logit model are reported in table 4.

The first observation is that financial literacy does actually not seem to matter to the savings decision once key control variables are accounted for! This is in contrast to the positive relationship between financial literacy and planning for retirement found by Lusardi and Mitchell (2006a) for Americans over age 50 or by Van Rooij *et al.* (2009) for a representative sample of the Dutch population.

Other variables are found to be correlated with knowledge of the importance of savings. For instance, working part-time or having a student job (p -value = 0.030) and studying economics (p -value = 0.037) is positively associated with thinking about retirement. As suggested by Chen and Volpe (2002), economics students may display a higher interest in finance related issues which in turn might lead them to think more about saving issues as well. As regards students working part-time, perceiving a proper wage may also increase students' interest in financial matters.

The irrelevance of financial literacy to the attitude with respect to savings in our sample could be explained in two ways. First, it may suggest that the financial literacy tests we adopted from the literature may not be precise enough to tackle the link between financial knowledge and savings choices. Second, it may be the consequence of a selection bias in our sample since the average level of financial literacy among our students is quite high or at least high enough not to matter to the savings decisions anymore.

Note that another of the results for this sample does not match the US experiences. Indeed, contrary to Lusardi and Mitchell (2009), we do not find that male respondents are more likely to think about saving money for retirement, and thus to plan, than are female respondents. Moreover, since the financial literacy variable does not matter, the financial literacy gender gap does not matter even indirectly in terms of the concern for savings.

**Table 4. Logit Marginal Effects of Association
with Thinking About Saving Money For Retirement**

	Think About Saving For Retirement
Financial Literacy	-0.094
	(0.095)
Female	-0.053
	(0.075)
Secondary education in Belgium	0.021
	(0.091)
MA2 +	-0.090
	(0.082)
Economics student	0.225**
	(0.108)
Live with their family	-0.059
	(0.082)
Working part-time	0.244**
	(0.112)
Parent higher education	0.018
	(.082)
Log Likelihood	
Log Likelihood	-81.89
Number of Observations	
Number of Observations	149
LR chi2(8)	
LR chi2(8)	13.45
Prob > chi2	
Prob > chi2	0.0972
Pseudo R-squared	
Pseudo R-squared	0.0759

Standard errors represented in parenthesis

Note: marginal effects calculated at the means of the independent variables

** $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$*

High Financial Literacy has been defined as having 4 or more financial literacy questions correct

4.3 Which Pension Plan Would Students Choose?

If there is no statistically significant impact of financial literacy on the savings decision, there may be an impact on the preference for a specific type of retirement savings plan (e.g. defined benefit (DB) vs defined contribution (DC)). To identify any difference, following Bailey *et al.* (2004), respondents were confronted with a small scenario asking them to choose between either a DB pension plan (OPTION_1), a DC plan, or not participating in the employer organized pension

plan at all (“Neither one”). The share of respondents choosing a DB (44.97%) or choosing a DC (42.28%) plan is quite balanced. A clear minority (19 respondents or 12.75% of the sample) decided not to participate in the employer organized pension plan by opting for the category “Neither one”.

To make the relevance of all the key variables as transparent as possible, we report the results from the regression according to the type of preference for savings. Table 5 shows, once again, that financial literacy is not significant in this choice and that there is no gender gap either in this case. Studying economics

Table 5. Multinomial Logit Marginal Effects of Choice of Employer Organized Pension Plan

	Defined-Benefit	Defined-Contribution	Neither One
Financial Literacy	.0690	-0.027	-0.042
	(.0941)	(0.094)	(0.061)
Female	0.007	0.041	-0.048
	(0.081)	(0.081)	(0.057)
Secondary education in Belgium	-0.144	0.001	0.143*
	(0.091)	(0.097)	(0.076)
MA2 +	-0.010	0.094	-0.084
	(0.085)	(0.084)	(0.059)
Economics student	0.044	0.059	-0.103
	(0.116)	(0.119)	(0.079)
Live with their family	-0.232***	.0203**	0.029
	(0.079)	(0.081)	(0.055)
Working part-time	0.040	-0.072	0.033
	(0.102)	(0.101)	(0.067)
Parent higher education	-0.111	0.078	0.033
	(0.087)	(0.091)	(0.065)
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Log Likelihood		-134.56	
Number of Observations		149	
LR chi2(16)		24.70	
Prob > chi2		0.0753	
Pseudo R-squared		0.0841	

Standard errors represented in parenthesis

Note: marginal effects are reported

** p < 0.1; ** p < 0.05; *** p < 0.001*

High Financial Literacy has been defined as having 4 or more financial literacy questions correct

does not make a difference either. In fact, few variables are significant explanations of how the young generation should be expected to choose between the main types of employer organized plans. However, controlling for all the usual factors discussed earlier points to two robust relationships. Living with one's family is negatively associated with choosing a DB plan (p -value = 0.003), and positively associated with opting for a DC plan (p -value = 0.012). The second significant result is that students with secondary education in Belgium are positively associated with choosing "neither one" and thus choosing not to participate (p -value = 0.059). Although the sample size is quite small for this group (19 students) and the results probably not quite as robust, it hints at the possibility that students directly concerned by the Belgian pension system, would be more at risk of having insufficient retirement savings at old age than the other students in the sample.

4.4 Contribution and Pension Payment Type

As the previous results show that there is a preference towards increased use of DC pension plans and this is also the direction in which the population is being pushed by pension reforms, it seems useful to try to get a sense of how much students would save if they were required to only choose a DC plan. Following Bailey *et al.* (2004), survey participants have been asked how much they would be willing to contribute to an employer organized second pillar pension plan if they had no other option.

The basic questionnaire shows that, in our sample, slightly more than half (57.7%) of the respondents decided to contribute the middle option (6% - 10%) to the employer organised defined-contribution plan. The rest is roughly split evenly with 32 respondents aiming at contributing more than 10% of their salary and 31 respondents aiming at 1% - 5%. In order to investigate students' contribution decisions and whether the previous results still hold even after controlling for several factors, a multinomial logit regression has been performed for the contribution options "1%-5%", "6%-10%" and "> 10%". Table 6 reports the marginal effects for each type of preferences.

Table 6 shows that there is a gender specificity in this context. Female students are more likely than male students to choose the low contribution option (p -value = 0.017). The finding is consistent with Bailey *et al.* (2004), for the US. Lower contribution rates (i.e. 1% - 5%) have also been identified for students living with their parents or partner (p -value = 0.058). Students living with their parents might be more confident that their parents will step in, in case they find themselves in financial difficulties and as a consequence, might perceive a reduced need to save. Moreover, the results show that students working part-time are more likely to pick a low contribution rate (p -value = 0.020) and less likely to choose the middle option (p -value = 0.044). One possible reason might be the difficulty to save a high fraction of one's salary if the perceived wage is low.

The regression results further point to the impact of parents on their children's contribution decisions. Students, whose parents have at least a Bachelor's degree, were significantly less likely to choose to contribute between 6% and 10% of

**Table 6. Multinomial Logit Marginal Effects
of Defined Contribution Plan Contribution Decision**

	1% - 5%	6% - 10%	> 10%
Financial Literacy	0.081	-0.034	-0.047
	(0.078)	(0.094)	(0.078)
Female	0.154**	-0.119	-0.035
	(0.065)	(0.079)	(0.068)
Secondary education in Belgium	-0.082	0.006	0.076
	(0.079)	(0.094)	(0.081)
MA2 +	-0.037	0.063	-0.027
	(0.071)	(0.085)	(0.073)
Economics student	-0.040	0.034	0.006
	(0.093)	(0.114)	(0.099)
Live with their family	0.130*	-0.118	-0.012
	(0.069)	(0.084)	(0.073)
Working part-time	0.160**	-0.190**	0.030
	(0.069)	(0.094)	(0.082)
Parent higher education	0.033	-0.175**	0.142*
	(0.074)	(0.089)	(0.087)
Log Likelihood			
	-133.29		
Number of Observations			
	149		
LR chi2(16)			
	23.74		
Prob > chi2			
	0.0954		
Pseudo R-squared			
	0.0818		

Standard errors represented in parenthesis

Note: marginal effects are reported

** $p < 0.1$; ** $p < 0.05$; *** $p < 0.001$*

High Financial Literacy has been defined as having 4 or more financial literacy questions correct

their salary, but more likely to choose the high contribution (namely "> 10%") option, although the latter finding is marginally significant, with a p-value of 0.10.

5 CONCLUSION AND POLICY IMPLICATIONS

A superficial review of the evidence from our Belgian sample could lead to a validation of the results of non-relevance of financial literacy for retirement savings decisions found by Alhenawi and Elkhal (2013) for the US. But it would be

misleading since the high level of financial literacy in our sample hides a strong heterogeneity with an impact on retirement savings decisions. The literacy differences across demographic groups can be linked to characteristics ranging from gender to the individual educational choices or the family educational story. This also points to differences in the impact of the increased freedom of retirement savings decision allowed by the reformed pension system. A share of the population is unlikely to be able to make the choices that would protect them from poverty risks when retirement time comes.

The populations most at risk are relatively well identified from the various differences in attitude with respect to retirement savings. The first main difference is across genders, confirming earlier studies (i.e. Bucher-Koenen *et al.* (2012) for a survey). Chen and Volpe (2002) suggest that the gender gap may be due at least in part to higher enthusiasm about financial issues and confidence in financial skills of men. The importance of this observation in the context of the discussion of a pension reform is increased by the fact that women's life expectation tends to be higher than men's.

The second difference is linked to the impact of education and the field of study. Unsurprisingly, economics students, second year master students and PhD students have significantly higher literacy scores than non-economics students and Bachelor or first year Master students. These results match earlier observations (e.g. Chen and Volpe (2002) for the US). Chen and Volpe (1998) had already argued that students might "naturally pick up" more knowledge about financial issues, the more years they have spent at university.

The third difference is more subtle. It reflects the impact of a possible Belgian cultural bias towards less financial saving.⁴ This conclusion may be somewhat mitigated by the observation that most students would opt for middle to high contribution rates. It may also be the reflection of the novelty of the new pension system.

The policy implication of the differences in attitude towards savings, and to some extent in terms of financial literacy is that policies will have to be targeted to those with choices excessively biased towards short run preferences rather than long term needs. If the pension system is to be equitable, these differences would have to be addressed in policies designed to improve awareness and understanding of the issues to minimize the risks of increasing poverty among the retirees directly linked to the reforms of the pension systems.

The obvious form of the policy intervention is to invest in education and awareness campaigns to reduce information gaps between categories as well as to improve incentives to account for the future needs at least as much as for the current needs. Targeted information and education campaigns should largely aim at the younger population but also at the parents. As suggested by Lusardi *et al.* (2009b) and Van Campenhout (2015), financial education programs for those demographic groups displaying lower levels of financial literacy and awareness should include parents as well. In our sample, the level and type of education of parents seems to influence how the younger generation takes its contribution

4. We did not take into account the Belgian bias in favour of savings in the form of home ownership.

decision. This is not an innocuous observation. In a context of rapidly changing financial markets and pension system reforms, asking for the advice and personal experience of parents is common but may actually not always be advantageous unless parents are educated about the options.

Clearly, additional research in the Belgian context would be needed to ensure the robustness of our conclusions. A larger random sample, representative of the entire population, is indeed needed before a full assessment of the ability of the population to make the most of their new freedom of decision on retirement savings. But even without this needed validation, the evidence suggests that the case for government follow up intervention is strong. Anticipating the problem should make it a lot more cost effective to deal with than having to take on the possibility of high social crisis that could be linked to a generation of workers who would not have understood the consequences of switching from a benefit based to a contribution based pensions system.

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