

# Financial Literacy and Retirement Planning – A Comparative Study for Austria and Switzerland

## PRELIMINARY AND INCOMPLETE

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### Abstract

This paper analyzes the impacts of financial literacy on the investment and pension planning behavior in Austria and Switzerland. Based on survey data of 453 individuals from Austria and Switzerland, we first analyze which sociodemographic and country-specific factors determine financial literacy. In a second step, we explain the investment and pension planning behavior by the level of financial literacy as well as other relevant person- and country-specific characteristics. In particular, we investigate differences between the Austrian and the Swiss with respect to financial literacy and the respective pension system and derive potential impacts on the pension planning behavior of the population. Our results show a higher level of financial literacy in Switzerland compared to Austria, and the difference is even larger for the factual compared to the self-assessed financial literacy. Also women are less financially literate than men. A higher financial literacy has a clear positive impact on the level of pension planning, whereas the effect of the self-assessed financial literacy is stronger than the impact of the factual one. Swiss people seem to care more about pension planning compared to Austrians, and the same holds for elder people compared to the younger persons in our sample. Overall, our results provide some potentially interesting insights on the impacts of institutional differences on pension planning and investment behavior.

**JEL Classification:** I22; J26; D14 ; P46; P52 ; C25

**Key Words:** Financial Literacy; Pension planning; Investment Behavior

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## **1. Introduction: Financial Literacy, investment behavior and retirement plans**

Particularly in Austria and in Switzerland, the demographic change<sup>1</sup> presents a challenge for the current pension systems. As consequence, the responsibility for the pension provision and pension planning is being shifted from governmental institutions to individuals (McRae, 1995, p. 21; Leyshon, Thrift, & Pratt, 1998, p. 33; Stäheli, Zobl, & Hobein, 2008, p.II; Lusardi & Mitchell, 2009, p.4). In addition, financial products serving the need of private pension provision have reached a high level of complexity. Dealing with this situation requires from individuals a high financial literacy (Leinert, 2004, p. 1; van Rooij, Lusardi, & Alessie, 2011, p. 2) to keep living standard at retirement age. Limited financial literacy is further viewed as one driver of delinquencies in the US (subprime) mortgage market (Gerardi et al., 2010). In Austria, financial illiteracy is being considered the most important factor with respect to entrepreneurial failures or even a hindering obstacle for business start-ups. The incapability of handling money is viewed as the second most important reason for private insolvencies (asb Schuldenreport 2008-2015, 2015). According to Wang (2013, p. 16) any kind of financial information, e.g. reception of financial news or reports, presupposes financial literacy to be perceived, understood und interpreted properly in a certain context, and thus can serve as basis for financial decisions such as investments or pension plans.

International studies (OECD, 2005; Lusardi & Mitchell, 2005; Stäheli, Zobl, & Hobein, 2008; Lusardi & Mitchell, 2009; Lusardi, Mitchell, & Curto, 2009; Lusardi & Mitchell, 2011a, 2011b; van Rooij, Lusardi, & Alessie, 2011; van Rooij, Lusardi, & Alessie, 2012; Mitchell & Lusardi, 2012; Messy & Atkinson, 2012; OECD, 2013; Lusardi, 2015) and studies carried out in Austria and in Switzerland (Prantner, Kollmann & Kollmann, 2006; ING Bank, 2012a; ING Bank, 2012b; Koch & Kornfeld, 2013; Silgoner & Weber, 2014; Aktienforum, 2014; Kolm & Plattner, 2014; ING Bank, 2014a; ING Bank, 2014b; Klapper, Lusardi, & van Oudheusden, 2015) state, however, a low level of financial literacy in the general population. Surveys investigating financial literacy in Austria and in Switzerland, which has been conducted so far, examined the level of financial literacy in general, but neglected its possible impacts. This paper proposes to close the gap by examining the relationship between financial literacy and macroeconomic factors it might affect such as investment behaviour and pension planning.

The contribution of this paper is the investigation of the financial literacy in Austria and in Switzerland and – in addition to other surveys which have been carried out in these countries – its contextualization with respect to information, investment and pension planning behavior of the working population. In this paper, we examine the relationship between financial literacy on the one hand and investment behavior and pension planning on the other hand in Austria and in Switzerland and compare the results between these two countries against the background of different pension systems, socio-economic and cultural aspects in the context of financial issues. The survey shows the reasons for the attractiveness and rejection of specific investment opportunities and the perceptual differences between Austria and Switzerland. In addition, this paper compares the empirical results with international surveys investigating the impact of financial literacy on investment behavior and pension planning. Second, the survey examines the information behavior of the working population in Austria and Switzerland with respect to investment and pension planning issues detailing different information sources and media channels and their role.

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<sup>1</sup> The average life expectancy increased from 69,78 years in 1961 by 11,62 years up to 81,40 years in 2014. The number of people at the age of 65 years or older per 100 people at the age of 15-64 increased from 2005 und 2015 by 3,9 people. The share oft he population at the age of 65 years or older shall increase from 18,4% in 2014 up to 28,7% in 2075 which is a plus of 10,3% (Statistik Austria, 2015a, 2015b, 2015c).

This paper is organized as follows: Section 2 provides a definition of financial literacy on which this paper is based upon. Section 3 gives an overview of scientific work regarding financial literacy in Austria and Switzerland as well as international surveys with focus on the relationship between financial literacy and investment behavior and pension planning. Section 4 presents the research questions and sections 5 describes the methodological approach and the data showing descriptive statistics of the sample structure. Finally, section 6 ad 7 provide the regression results which are discussed and interpreted in the context of the international scientific work. The submitted paper is to be considered as a preliminary version which will be completed by further statistical analysis and a comprehensive discussion of the empirical results.

## **2. Definition of financial literacy**

The term literacy means „the ability to read [and] write“ (LINCS, o. J.) und “[the] knowledge that relates to a specified subject“ (Merriam-Webster). The term literacy also includes the ability to interpret the text read. Hence, financial literacy refers to the knowledge about finances and the ability to understand and interpret financial communication and information about financial products. The Organization for Economic Cooperation and Development (OECD) defines financial literacy as follows: “Financial literacy is the knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life” (OECD, 2013, p. 33). According to the OECD, financial literacy includes financial knowledge which is necessary to make efficient financial decisions and to be able to participate in economic life. As a result, the financial well-being of individuals and the society should be improved. Financial literacy defined by the OECD can be compared with the term financial competence defined by Friebel & Kaminski (2012). In accordance with these definitions, a financially literacy person is able to orientate at financial markets (Friebel & Kaminski, 2012, p. 6). This includes the ability to understand the connection between risk and return of a financial product (Greimel-Fuhrmann, 2012, p. 2).

The literature provides many other definitions of financial literacy (Buckland, 2010, p. 360; Colorado Department of Education, 2005, p. 2; Greimel-Fuhrmann, 2012, p. 2; Greimel-Fuhrmann, 2014, p. 49; Leinert, 2004, p. 4; Messy & Atkinson, 2012, p. 14; OECD, 2005; Stäheli, Zobl, & Hobein, 2008, p. 3ff.; Wang, 2013, p. 22). The majority of these definitions are reflected in the definition of the OECD mentioned above or are derived from it.

The term financial literacy should be demarcated from the term financial education. A definition of the OECD describes the components and purposes of financial education: “Financial education is the process by which financial consumers / investors improve their understanding of financial products and concepts and, through information, instruction and / or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being.” (OECD, 2005, p. 26). In other words, financial education is the process of improving financial literacy. According to the definitions of the OECD financial literacy is the objective and result of financial education.

## **3. Literature review**

This chapter reviews the literature on financial literacy, with special consideration of the studies that focus on Austria and Switzerland.

### **3.1 Studies on financial literacy in Austria**

While there exists some evidence on the level of financial literacy in Austria, the number of studies is quite manageable. Interestingly, half of the studies were conducted in 2014. Already in 2006, the Österreichischer Gewerkschaftsbund, an important Austrian union with over 1.2 mio members, commissioned a survey on consumer credits, life insurances and investment funds. Its purpose was to test the consumer competence of employees and apprentices and in Vienna (Prantner, Kollmann & Kollmann, 2006). The results showed that the knowledge on consumer credits was quite limited, even though many participants had already concluded a respective contract and closed a consumer credit. Only one quarter of the participants was able to specify the total financial liabilities of such a credit. About 50% of the respondents did not know that the periodic credit payment consisted of the interest payment and the debt amortization. Only one third knew the difference between the nominal and real interest rate. Also, one third of the participants was able to describe the characteristics of an investment fund, but another third was completely unable to explain this term. Investment funds are commonly associated with stocks and speculation.

The ING Bank, belonging to the Dutch multinational banking and financial services corporation ING Group headquartered in Amsterdam, has been intensively engaged in financial literacy for a while and regularly conducts international studies on the topic. In what follows, we describe four of these ING Bank studies, which seem most relevant for our considerations. In 2012, ING Bank published the first international study in which Austria was participating (ING Bank, 2012a). The study compared financial literacy in eleven different countries, with about 1,000 persons 18 years and older that participated in the online survey. The questions with respect to financial literacy were very similar to the ones used in Lusardi and Mitchell (2005) as well as in van Rooij, Lusardi und Alessie (2011).

(2011). In particular, the questions referred to knowledge on interest calculation, inflation, bonds, mortgages and the risk-return relationship. Turkey scored highest among the participating countries, and Austria was at the rear end. Overall, financial literacy proofed to be not very high in all countries, and men scored generally higher than women. In addition to questions related to financial literacy, information on financial education and financial decision making were recorded. In Austria, 30% of the respondents did not get financial education, and 93% of the survey participants considered the schools to be responsible for financial education. Furthermore, 65% of the respondents were carefully overviewing their finances, but more than half, i.e., 55% of the survey participants, preferred to get advice from their financial services provider instead of comparing financial products themselves. Unfortunately, the study did not investigate relationships between these topics, and therefore, it was not possible to conclude whether a person with a higher financial education also scored better in term of financial literacy.

Another study by the ING bank dealt with long-term savings and pension planning (ING Bank, 2012b). For 12 countries 1,000 persons were interviewed. The results showed that about 69% of Austrians did have long-term savings which were not part of the pension planning. Austria ranked third in this respect. Also less than half (i.e. 45%) did have a private pension plan in Austria, which brought the county on rank 4. Austria and the Netherlands were the only two countries in the survey where population did not worry much about not having enough money when being retired.

In still another study, the ING-Bank tested the knowledge about one's own financial situation (ING Bank, 2014a). For 13 European countries each 1,000 persons participated in a survey. In Austria, 18% did not know how much debt they had. This result corresponded to the average of the entire sample.

Finally, another international study by the ING Bank (ING Bank, 2014b) investigated for 13 countries again with 1,000 participants in each country how financial decisions were taken. Over all countries

considered, an average of 73% of the participants expressed their opinion that a person is mainly responsible him- or herself for his or her own financial decisions, and the share for Austria was even higher with 82%. 67% of the respondents overall considered managing money more difficult than 10 years ago, while this percentage amounted to 56% for Austria. The study did not include explicit questions on financial literacy. However, financial literacy includes knowledge on being able to deal with financial products and to take financial decisions thoroughly. The fact that financial decisions were perceived as increasingly more difficult over can be interpreted as clear indication for a higher importance of financial literacy in the future.

Two master theses from students from the Vienna University of Economics and Business dealt with the investigation of financial literacy. Koch and Kornfeld (2013) analyzed the level of economic education of students at commercial schools und grammar schools. Their survey questions included topics such as the GDP and economic growth, business cycles, inflation and its impacts on unemployment, import and export, corporation types, interest and pricing decisions. The questionnaire was send to 400 students (186 from grammar schools and 214 from commercial schools in Vienna, Lower Austria and Burgenland. The commercial schools performed better with respect to business oriented questions, while the grammar schools ranked higher with respect to economic topics. Financial literacy questions, however, caused difficulties for both groups considered.

The second master thesis compared the financial literacy between students from a commercial school and the Vienna University of Economics and Business (Kolm & Plattner, 2014). The following topics were investigated: Financing, investments, insurances, Austrian tax and social security system, and percentage calculations. The sample included 102 students from commercial schools und 321 students from university, so in total 423 participants. The majority of the survey participants overestimated their financial knowledge. About one third revealed deficits in terms of financial knowledge. Master students of the Vienna University of Economics and Business were most able and the Bachelor students were the least able to correctly answer to the majority of the questions. In terms of behavioral questions, no significant differences between the groups were found.

The Aktienforum, an over 25-year old Austrian discussion forum focusing on investment topics, investigated the investment behavior of 4,007 Austrian aged 16 and (Aktienforum, 2014). The purpose of the investigation was to gain information on security ownership, interests in investment issues, information sources for investment decisions, as well as general attitudes towards the stock market exchange and financial markets. Only 3% of the interviewed persons owned stocks, and only 6% were invested in funds, and these figures have been decreasing over time. Among the participants who do not own any stocks, only 7% were interested in security investments. Furthermore, banks were found to be an important source of investment information. According to this study, the Austrian population seems in general very skeptical with respect to investing money in stocks and funds. Also, many people consider the stock market exchange as a non-transparent construct. Accordingly, the role and economic significance of the stock exchange are largely underestimated. This lack of see through and the underestimation of the stock exchange could be the consequence of a low financial literacy.

In 2014, the Austrian Central Bank published a study on the financial literacy of Austrian households (Silgoner & Weber, 2014). Overall, 1,994 person aged 15 and older were interviewed by computer-assisted personal interviewing (CAPI). In addition to questions similar to the ones used by Lusardi und Mitchell (2005) and van Rooij, Lusardi, und Alessie (2011), information on the self-evaluation of financial literacy, the attitude towards money, the financial behavior as well as socio-demographic characteristics were recorded. The authors detected significant knowledge gaps. In particular, women and persons with a low education scored poorly with respect to the knowledge questions. Many respondents overestimated their financial literacy, and the majority of respondents proofed to be very

careful and risk adverse in relation with financial questions.

The study „Financial Literacy Around the World“ by Klapper, Lusardi and van Oudheusden (2015) is one of two international survey in which Austria was participating. Overall, 150,000 persons aged 15 and older from 144 countries were participating. In order to record the level of financial literacy in an international context, the authors used almost the same questions as in Lusardi und Mitchell (2005) and van Rooij, Lusardi, und Alessie (2011). On average, 37% of the adult survey population were able to correctly answer three out of four questions on financial literacy. In Austria, this share amounted to 53%, which corresponded to rank 21. In general, women have a lower performance than men with respect to financial literacy. In countries with a GDP larger than \$12.000, the authors found a positive correlation between GDP and financial literacy.

### **3.2 Studies on financial literacy in Switzerland**

Given that Switzerland does not belong to the European Union, most international studies mentioned above do not include it. Also, Switzerland did not participate in the OECD study in 2005, and there exists only limited empirical research on that topic. Accordingly, the knowledge on financial literacy in Switzerland is rather limited.

In 2007, the Federal Office of Justice commissioned a study on the private indebtedness of the young population in Switzerland (Streuli, 2007). Even though financial literacy was not directly investigated, the topic of indebtedness is somehow related. Based on an online survey with 500 persons aged 18-24 years from the German speaking part of Switzerland, the author found that 38% of the respondents indicated to have outstanding monetary liabilities. However, for half of this group debt amounted to less than Fr. 1.000. Also, 30% of the debtors borrowed money from family or friends. For every 7th person debt was higher than the monthly income.

Stäheli and Zobl (2008) surveyed 104 individuals through their private network, 108 students and 103 employees from their university in addition to 45 employees of two Swiss companies in order to collect data on money management, the own assessment of their financial literacy and potential differences to factual financial literacy as well as their financial education background. For this purpose, they also created a “Self Evaluation Index” and a “Financial Literacy Index in order to compare the own assessment with the real knowledge. Their results indicated the existence of a gender gap in financial literacy, with women having lower scores but also more often answering “don’t know” compared to men. Also, they found a significant over-confidence of financial literacy, which was was, however, decreasing with increasing levels of financial literacy. Also, the authors found weak results with respect questions related to risk-return relationships, investment rewards as well as the Swiss retirement system. Even though the study revealed some interesting outcomes, the results were limited given the lack of a representative data basis on which results are based.

Birchler et al. (2011) used a representative survey to collect information on investment and stock-market behavior. They also collected data on the participants’ knowledge with respect to differences between stocks and bonds, the functioning of structured products, etc. Their results related stock market participation of Swiss households to self-assessed measures of financial literacy. Note, however, that that they did not use the standardized financial literacy questions as employed by, e.g., Lusardi and Mitchell (2005) or van Rooij, Lusardi, und Alessie (2011), and self-assessed measures of financial literacy are likely to result in people overstating the financial knowledge (see, e.g. Staehli & Zobl, 2008)

Brown and Graf (2012) used survey data on the level of financial literacy from 1.500 individuals aged 20-74 years from the German speaking part of Switzerland to examine how financial literacy is

related to household investment and borrowing. The data was elicited by GfK Switzerland in April 2011 on behalf of the University of St. Gallen, and the survey was implemented with telephone interviews. The authors found that half of the respondents were able to answer three questions on basic financial concepts (compound interest, inflation and risk diversification) correctly. They conclude that the level of financial literacy in Switzerland is comparable to that reported by Bucher and Lusardi (2011) for Germany and Alessie et al. (2011) for the Netherlands. Also, financial literacy was found to be lower among low-income and immigrant households as well as among women. Young households seem to be less familiar with the concept of inflation, while retirees are less familiar with the concepts of compound interest and risk diversification. The authors also found financial literacy to be strongly correlated with financial market participation, voluntary retirement saving and mortgage borrowing.

### **3.3 International studies on financial literacy**

The OECD conducted in the course of the PISA study 2012 an investigation on financial literacy (OECD, 2014). The target group were 15-year-old in 18 different countries. Neither Austria nor Switzerland participated in the international OECD study. The aspect examined in the study were e.g. the capability of the pupils to read and understand invoices, to compare consumer goods prices, to compare terms of credit cards and to read and interpret salary statements. The study took two hours in total (one hours covered questions on financial knowledge, 30 minutes covered questions on mathematics, and 30 minutes covered reading comprehension). Shanghai-China achieved best results, Columbia the worst results. Based upon the test results, only 10% could be recognized as financially literate and 15% as financially illiterate. A good financial literacy correlated mostly positive with good mathematical and reading comprehension skills.

Another pilot study also initiated by the OECD (Messy & Atkinson, 2012) investigated financial literacy in 14 counties with individuals older than 18 years. Again, neither Austria nor Switzerland participated in the study. The respondents should answer seven questions on interests, compound interests, time value of money, risks etc. Additionally, questions on the opinion towards financial issues und financial behavior were included. The results show that the vast majority of the respondents were financially illiterate, and that the respondents overestimate their financial knowledge. Female respondents achieved worse results than male respondents. Furthermore, a positive correlation between financial literacy and a solid financial behavior with respect to budgeting, overdraft etc. could be stated. In addition, financial illiteracy correlated with low education level and low salary.

## **4. Research Questions**

Based upon the findings of the literature analysis described above and the current macroeconomic developments in Austria and in Switzerland supporting the evidence of a relationship between financial literacy and investment behavior and pension planning, our paper examines the following research questions:

RQ1: Which relevance has financial literacy gained as a research and public discourse topic in Austria and Switzerland in the international comparison?

RQ 1.a: To what extent has been financial literacy in Austria and in Switzerland investigated until 2016?

RQ 1.b: What focus has been set in the research studies conducted on financial literacy in Austria and Switzerland until 2016?

RQ2: To what extend does the self-assessed financial knowledge differ from the factual financial knowledge among the working population in Austria and Switzerland? Which demographic factors such as age, education or sex seem to influence the relationship between the self-assessed and factual financial knowledge?

RQ3: What is the impact of financial literacy on the investment behavior and pension planning among the working population in Austria and Switzerland, and to what extent does the relationship between financial literacy on the one hand and investment behavior and pension planning on the other hand distinguish between Austria and Switzerland?

RQ4: Which information sources do individuals use to acquire financial information?

## 5. Methodology and Data

### 5.1 Methodological Approach

The quantitative online survey was carried out from February 9 to March 20 2016. The online questionnaire was distributed via social networks to working population in Austria and in Switzerland, whereas the questionnaire for Switzerland was slightly adopted due to country specific requirements such as currency and financial terminology. Apart from this few adjustments, the questionnaire for Austria and Switzerland are totally correspondent.

The questions were derived from extant literature and reflect (1) the self-assessment of financial knowledge, risk affinity and financial behavior, (2) information sources in the context of investment behavior and pension planning, (3) potential investment behavior and reasons for the attractiveness and rejection of certain investment products, (4) pension planning and information sources in the context of pension planning, (5) basic and advanced financial knowledge, (6) interest in financial information in media, (7) real investment behavior, (8) potential motives to deal with financial topics, and (9) the demographic data of the respondents.

The quantitative data were statistically evaluated. In a first step, we use descriptive analyses in order to explore the main characteristics of the variables in our sample as well as correlations between them. In a second step, we use a regression approach with an econometric model in order to investigate cause and effect mechanisms between financial literacy, investment behavior and pension planning, respectively, and the relevant explanatory variables.

For our regression analyses, we use an ordered logit model to explain the level of financial literacy, investment behavior and pension planning, respectively, by a set of socio-demographic and country-specific characteristics. The dependent variable  $y_i^*$  is an ordinal variable and refers to the relevant aspects of the particular variable considered. Depending on considered aspect, it takes possible values between 0 and 1, respectively as lowest possible value, and a maximum value up to 16 as highest possible value. We measure the financial literacy as well as the degree of pension planning as outlined in Table 1.

The independent variables consist of socio-demographic and country-specific characteristics. The model where we explain the degree of pension planning also includes the indicators of financial literacy, both included alternatively.

The econometric model is given by equations (1)

$$\Pr(y_i^*) = \alpha_0 + \alpha_1 X_i + \alpha_2 Z_j + \varepsilon_i \quad (1)$$

where  $X_i$  is the vector of person-specific socio-demographic characteristics, and  $Z_j$  is the vector of country-specific variables .

## 5.2 Sample and Data

In total, we collected 453 evaluable responses, whereas 343 responses cover the Austrian and 110 the Swiss section. Table 0 mirrors the sample structure with respect the demographic criteria. The absolute and relative frequencies are displayed for Austria and for Switzerland.

**Table 0:** Sample structure

Outline criteria	Austria n (%)	Switzerland n (%)	Total n (%)
1. Sex			
1a. male	154 (44.9)	65 (59.1)	219 (48.3)
1b. female	189 (55.1)	45 (40.9)	234 (51.7)
2. Age			
2a. 20 years and younger	29 (8.5)	4 (3.6)	33 (7.3)
2b. 21 – 30 years	128 (37.3)	25 (22.7)	153 (33.8)
2c. 31 – 40 years	69 (20.1)	27 (24.5)	96 (21.2)
2d. 41 – 50 years	68 (20.1)	32 (29.1)	100 (22.1)
2e. 51 – 60 years	39 (11.4)	19 (17.3)	58 (12.8)
2f. 61 – 70 years	9 (2.6)	3 (2.7)	12 (2.6)
2g. 71 years and older	1 (0.3)	0 (0.0)	1 (1.0)
3. Professional Activity			
3a. full-time	195 (56.9)	73 (66.4)	268 (59.2)
3b. part-time	47 (13.7)	21 (19.1)	68 (15.0)
3c. marginally employed	29 (8.5)	2 (1.8)	31 (6.8)
3d. unemployed	12 (3.5)	5 (4.5)	17 (3.8)
3e. unemployed student	60 (17.5)	9 (8.2)	69 (15.2)
4. Employment Relationship			
4a. employed	223 (65.0)	77 (70.0)	300 (66.2)
4b. self-employed	31 (9.0)	12 (10.9)	43 (9.5)
4c. employed and self-employed	27 (7.9)	9 (8.2)	36 (7.9)
4d. unemployed	62 (18.1)	12 (10.9)	74 (16.3)
5. Working in the Finance Sector			
5a. yes	31 (9.0)	26 (23.6)	57 (12.6)
5b. no	312 (91.0)	84 (76.4)	396 (87.4)
6. Education			
6a. compulsory school	5 (1.5)	1 (0.9)	6 (1.3)
6b. apprenticeship	36 (10.5)	0 (0.0)	36 (7.9)
6c. professional school	11 (3.2)	7 (6.4)	18 (4.0)
6d. grammar school	44 (12.8)	10 (9.1)	54 (11.9)
6e. vocational school	54 (15.7)	8 (7.3)	62 (13.7)
6f. college	13 (3.8)	2 (1.8)	15 (3.3)
6g. bachelor degree	61 (17.8)	19 (17.3)	80 (17.7)
6h. master degree	90 (26.2)	48 (43.6)	138 (30.5)
6i. doctor degree	29 (8.5)	15 (13.6)	44 (9.7)
7. Income			
7a. less than 1,000 EUR/CHF	80 (23.3)	8 (7.3)	88 (19.4)
7b. 1001 – 2,000 EUR/CHF	101 (29.4)	5 (4.5)	106 (23.4)
7c. 2,001 – 3,000 EUR/CHF	88 (25.7)	7 (6.4)	95 (21.0)
7d. 3,001 – 4,000 EUR/CHF	24 (7.0)	5 (4.5)	29 (6.4)
7e. 4,001 – 5,000 EUR/CHF	8 (2.3)	8 (7.3)	16 (3.5)
7f. 5,001 – 6,000 EUR/CHF	3 (0.9)	8 (7.3)	11 (2.4)

7g. 6,001 – 7,000 EUR/CHF	2 (0.6)	8 (7.3)	10 (2.2)
7h. 7,001 – 8,000 EUR/CHF	0 (0.0)	9 (8.2)	9 (2.0)
7i. 8,001 – 9,000 EUR/CHF	0 (0.0)	5 (4.5)	5 (1.1)
7j 9,001 – 10,000 EUR/CHF	1 (0.3)	8 (7.3)	9 (2.0)
7k more than 10,000 EUR/CHF	3 (0.9)	27 (24.5)	30 (6.6)
7l refused	33 (9.6)	12 (10.9)	45 (9.9)

Note: This table displays the frequencies regarding (1) sex of the respondents, (2) the age of the respondents, (3) how many hours the respondents are working, (4) the employment relationship of the respondents, (5) whether the respondents are working in the finance sector, (6) the education level of the respondents and (7) the income level of the respondents.

Table 1 outlines the definitions of the variables used in our analyses. Note that we measure financial literacy by means of different variables. The index self-assessed financial literacy is the sum of the answers to three separate questions, which all measure different aspects of financial literacy and for which the relevant information are also reported. The index of the factual or real financial literacy is based on a set of questions on the basic and the advanced level, and the index represents the sum of the correct answers, where each correct answer represents one point.

**Table 1:** Variable descriptions

Variable name	Variable description
Self-assessed financial knowledge	Self-assessed knowledge about financial products and investment possibilities, (min=1, max=4)
Self-assessed ability to use financial knowledge for investments	Self-assessed ability to use own financial knowledge to invest money, (min=1, max=4)
Self-assessed ability to handle money and a budget	Self-assessed ability to handle money and to plan a household budget, (min=1, max=4)
Index of self-assessed financial literacy	Sum of answers from the three self-assessment questions with respect to financial literacy (min=0, max=12)
Index of real financial literacy	Sum of correct answers from the basic and advanced financial literacy questions (min=0, max=16)
Pension planning indicator	Degree to which respondent has thought about pension planning (min=1 max=4)
Dummy: female	Dummy: 1 if respondent is female, 0 else
Dummy: self-employed	Dummy: 1 if respondent is self-employed, 0 else
Dummy: mandatory school	Dummy: 1 if respondent has mandatory school as highest education, 0 else
Dummy: financial service industries	Dummy: 1 if respondent is working in the financial services industries, 0 else
Age	Age in years
Dummy: Switzerland	Dummy: 1 if respondent is from Switzerland, 0 else

This table reports the names and the definitions of the variables used in our analyses.

The descriptive statistics can be found in

Table 2. Note that we also include the information whether the mean of each variable is significantly different between the two countries considered (asterix in the column for Switzerland). As we can see from the data, Switzerland has a significantly higher level of self-assessed as well as factual financial literacy. Also, the Swiss respondent seem to have thought more about their pension planning compared to Austrians in the sample. However, it is possible that these differences might be related to the different sample structure, i.e., the higher share of respondents working in the financial services industries as well as the higher age of the Swiss sample. In order to control for these difference, we need to use regression analyses.

**Table 2:** Descriptive statistics

Variable name	Austria		Switzerland		All	
	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev
Self-assessed financial knowledge	2.25	0.89	2.71***	0.91	2.36	0.92
Self-assessed ability to use financial knowledge for investments	2.19	0.85	2.48***	0.89	2.26	0.87
Self-assessed ability to handle money and a budget	3.32	0.68	3.46***	0.63	3.35	0.67
Index of self-assessed financial literacy	7.76	1.92	8.65***	1.94	7.98	1.96
Index of real financial literacy	11.60	3.12	13.55***	2.66	12.08	3.12
Indicator of pension planning	2.69	0.97	3.09***	0.85	2.79	0.96
Dummy: female	0.55		0.41***		0.52	
Dummy: self-employed	0.09		0.11		0.09	
Dummy: mandatory school	0.01		0.01		0.01	
Dummy: financial services industries	0.09		0.24***		0.13	
Age	35.39	12.65	39.78**	12.03	36.45	12.63
Dummy: Switzerland					0.24	

This table reports descriptive statistics of our regression variables. For the notation of the variables see Table 1. The full sample includes 453 observations, 343 from Austria and 110 from Switzerland. Differences between the means of the countries that are significantly different from zero at the 1%, 5%, and 10% level are marked with \*\*\*, \*\*, and \* respectively in the column for Switzerland, and are based on two-sided means difference tests with unequal variance.

Table 3 and Table 4 report the survey results of the questions with respect to basic financial literacy, for both subsamples and for the entire sample. Describe more.

**Table 3:** Basic financial literacy; Percentages of Total Number of Respondents

	Numeracy	Interest compounding	Inflation	Time value of money	Money illusion
Austria (N=343)					
Correct	83.67	70.85	87.76	60.35	76.68
Incorrect	15.45	26.24	4.08	31.49	21.57
Do not know	3	2.92	8.16	8.16	1.75
Switzerland (N=110)					
Correct	97.27	78.18	93.64	69.09	85.45
Incorrect	2.73	20	2.73	24.54	14.54
Do not know	0	1.82	3.64	6.36	0
All (N=453)					
Correct	86.98	72.63	89.18	62.47	78.81
Incorrect	12.36	24.72	3.76	29.80	19.87
Do not know	0.66	2.65	7.06	7.73	1.32

**Table 4: Basic financial literacy; Percentages of Total Number of Respondents**

	Correct	Incorrect	Do not know	Correct	Incorrect	Do not know	Correct	Incorrect	Do not know
	Austria (N=343)			Switzerland (N=110)			All (N=453)		
Which statement describes the main function of the stock market?	88.92	5.54	2.92	96.36	1.82	1.82	90.73	4.64	2.65
What happens if somebody buys the stock of firm B in the stock market?	91.25	5.83	0.87	95.45	3.64	0.91	92.27	5.30	0.88
Which statement about mutual funds is correct?	75.51	10.50	1.17	93.64	1.82	0.91	79.91	8.39	1.10
What happens if somebody buys a bond of firm B?									
Considering a long time period (e.g. 10 or 20 years), which asset normally gives the highest return: savings accounts, bonds or stocks?	72.59	6.12	3.21	85.45	2.73	0.91	94.70	5.30	2.65
Normally, which asset displays the highest fluctuations over time: savings accounts, bonds or stocks?	51.31	29.74	18.95	74.55	17.27	8.18	56.95	26.71	16.34
When an investor spreads his money among different assets, does the risk of losing money: increase, decrease or stay the same?	86.01	8.45	5.54	94.55	2.73	2.73	88.08	7.06	4.86
If you buy a 10-year bond, it means you cannot sell it after five years without incurring a major penalty. True or False?	48.69	51.31	0	68.18	31.82	0	53.42	46.58	0
Stocks are normally riskier than bonds. True or False?	76.38	23.62	0	89.09	10.91	0	79.47	20.53	0
Buying a company fund usually provides a safer return than a stock mutual fund. True or False?	73.76	26.24	0	85.45	14.55	0	76.60	23.40	0
If the interest rate falls, what should happen to bond prices: rise, fall or stay the same?	31.78	34.69	33.53	53.64	27.27	19.09	37.09	32.89	30.02
An investment with a higher probability of a higher return is usually also riskier. True or False?	84.55	15.45	0	95.45	4.55	0	87.20	12.80	0

## 6. Regression results

### 6.2 Determinants of financial literacy

The results of our regression analyses explaining the level of self-assessed as well as factual financial literacy can be found in Table 5.

**Table 5: Ordered logit results of self-assessed and factual financial literacy**

	Self-assessed financial literacy				Factual financial literacy
Dependent variable: Financial literacy	Financial knowledge	Ability to use financial knowledge for inv.	Ability to handle money and a budget	Index of self-assessed financial literacy	Index of factual financial literacy
Dummy: female	-1.465*** (0.190)	-1.341*** (0.199)	-0.178 (0.189)	-1.257*** (0.181)	-1.449*** (0.179)
Dummy: self-employed	0.289 (0.262)	0.682** (0.280)	0.197 (0.333)	0.462* (0.247)	0.542* (0.306)
Dummy: mandatory school	-2.039*** (0.750)	-1.324** (0.581)	-1.096 (1.376)	-1.931** (0.892)	-1.856*** (0.660)
Dummy: Financial services	2.747*** (0.342)	2.167*** (0.310)	0.599** (0.277)	2.307*** (0.295)	1.672*** (0.260)
Age	-0.00241 (0.00741)	-0.000268 (0.00701)	0.0122 (0.00805)	0.00430 (0.00705)	0.0144** (0.00716)
Dummy: Switzerland	0.503** (0.215)	0.183 (0.215)	0.247 (0.227)	0.351* (0.201)	0.897*** (0.220)
Wald chi <sup>2</sup>	144.15***	131.31***	15.45**	152.79***	172.33***
Observations	453	453	453	453	453

This table reports results from ordered logit regressions of the effects of person- and country-specific characteristics on financial literacy indicators. For the notation of the variables see Table xx. Robust standard errors in brackets. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with \*\*\*, \*\*, and \* respectively.

### 6.2 Determinants of financial planning

The results of our regression analyses explaining the level of financial planning can be found in Table 6. Describe results.

**Table 6: Ordered logit results of pension planning**

Dependent variable: Pension planning	Austria		Switzerland		All	
	(1)	(2)	(1)	(2)	(1)	(2)
Self-assessed financial literacy	0.165** (0.0654)		0.389*** (0.119)		0.211*** (0.0582)	
Factual financial literacy		0.0549* (0.0313)		0.204*** (0.0785)		0.0772*** (0.0291)
Dummy: female	0.0763 (0.235)	-0.0184 (0.221)	0.368 (0.406)	0.354 (0.478)	0.142 (0.204)	0.0411 (0.198)
Dummy: self-employed	-0.229 (0.372)	-0.212 (0.384)	-0.208 (0.751)	-0.0685 (0.704)	-0.205 (0.328)	-0.176 (0.331)
Dummy: mandatory school	0.160 (0.714)	0.0394 (0.642)	-18.23*** (1.250)	-19.31*** (1.204)	-0.179 (0.707)	-0.381 (0.686)
Dummy: Financial services	0.0259 (0.365)	0.238 (0.368)	-0.693 (0.551)	-0.287 (0.498)	-0.193 (0.289)	0.0713 (0.283)
Age	0.0683*** (0.0106)	0.0670*** (0.0106)	0.105*** (0.0169)	0.0997*** (0.0164)	0.0764*** (0.00937)	0.0747*** (0.00931)
Dummy: Switzerland					0.369* (0.194)	0.340* (0.198)
Wald chi <sup>2</sup>	53.72***	47.63***	412.84***	408.14***	101.15***	92.58***
Observations	343	343	110	110	453	453

This table reports results from ordered logit regressions of the effects financial literacy indicators, person- and country-specific characteristics on pension planning. For the notation of the variables see Table xx. Robust standard errors in brackets. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with \*\*\*, \*\*, and \* respectively.

## **7. Conclusions**

Our results show a higher level of financial literacy in Switzerland compared to Austria, and the difference is even larger for the factual compared to the self-assessed financial literacy. People who work in the financial services industries are financially more literate, on average. Also, women are less financially literate than men, and older people have a higher financial literacy. Furthermore, a higher financial literacy has a clear positive impact on the level of pension planning, whereas the effect of the self-assessed financial literacy is stronger than the impact of the factual one. This result holds for Austria and Switzerland, with stronger results for the Swiss. Also, Swiss people seem to care more about pension planning compared to Austrians, and the same holds for elder people compared to the younger persons in our sample. Interestingly, even though employees of the financial services industries are financially more literate, they do not care more about their pension planning compared to employees in other industries. Overall, our results provide some potentially interesting insights on the impacts of institutional differences on pension planning and investment behavior.

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