

# Financial literacy in Austria – focus on millennials

Pirmin Fessler, Marilies Jelovsek, Maria Silgoner<sup>1</sup>

Refereed by: Brent Kigner, Fachhochschule Kufstein Tirol, University of Applied Sciences, emeritus;  
Eveline Wuttke, Goethe University Frankfurt, Department of Business Education

*This article summarizes the main findings from the second wave of the Austrian Survey of Financial Literacy (ASFL), the Austrian contribution to the OECD/INFE survey on adult financial literacy, which was conducted in spring 2019. As compared to the previous survey round in 2014, the financial knowledge of Austrian residents seems to have increased significantly. While men outperform women in terms of financial knowledge, they score slightly worse in terms of financial behavior and attitudes. Austrian residents are rather prudent, risk averse and forward looking and have a good overview of their finances.*

*In general, financial literacy is rather equally distributed across age groups. However, 15- to 38-year-olds (hereinafter called millennials) differ from other age cohorts in several respects: They have relatively low levels of financial literacy, are less financially organized, and they show more risky and less forward looking behavior. At the same time, they are more open to digital means of payments and financial innovations in general. Even though the observed differences are not very large and may vanish as millennials mature and gain experience with business and finance, we deem it important to monitor the financial literacy development for this group, given the rising complexity of financial decisions many among this group will face and the tremendous financial resources they will ultimately inherit.*

*JEL classification: A20, D12*

*Keywords: financial literacy, financial education, financial stability, survey data*

In the aftermath of the global financial crisis, the issue of financial education has come to the fore, and financial literacy has gained international recognition as a critical life skill for individuals (Hilgert et al., 2003). Innovations and advanced technologies have increased the number of financial products and services offered, creating a complex and fast-paced financial landscape. In light of the complexity of the financial market, financial education efforts have been stepped up, and relevant strategies and programs have been developed in recent years (Alsemgeest, 2015).

At the same time, scientific interest in the topic has increased almost exponentially, as suggested by chart 1, which shows the number of citations of the term “financial literacy” in scientific journals (SSCI index).

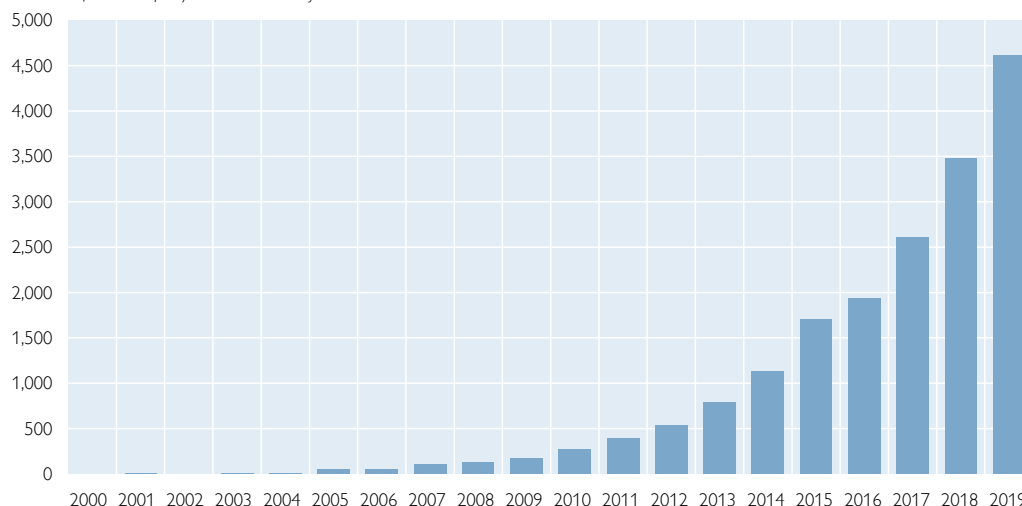
The OeNB works in close contact with the education community in Austria to improve financial literacy. The OeNB’s main goal in this area is to help consumers make sound financial decisions. Topics such as monetary policy, inflation and price stability are regular features of interactive programs (workshops, presentations and teacher seminars) that are created in line with the OeNB’s mission statement (“We support financial literacy by offering a broad range of information and education services”).

An important precondition for any financial education program is sound information about the state of financial literacy. A mere decade ago, research on what

<sup>1</sup> Oesterreichische Nationalbank (OeNB), Foreign Research Division, [pirmin.fessler@oenb.at](mailto:pirmin.fessler@oenb.at) and [maria.silgoner@oenb.at](mailto:maria.silgoner@oenb.at); Financial Literacy and Information Activities Division, [marilies.jelovsek@oenb.at](mailto:marilies.jelovsek@oenb.at). The views expressed in this paper are exclusively those of the authors and do not necessarily reflect those of the OeNB or the Eurosystem. The authors would like to thank Andreas Breitenfellner, Alexander Lengheim, Irene Popenberger and Ingeborg Schuch for very helpful comments and suggestions.

### Citation index for the term “financial literacy”

Number of citations per year in SSCI-listed journals



Source: Social Sciences Citation Index (SSCI), January 2020.

people know about economics and finance was scarce, primarily due to a lack of a universally accepted approach of how to measure financial literacy. Annamaria Lusardi and her coauthors (e.g. Lusardi and Mitchell, 2008) were pioneers in designing a small set of financial knowledge questions that later became known as the Big Three<sup>2</sup> and were adopted in surveys in dozens of countries around the world. The set of questions was extended subsequently in the following years, but overall the coverage of the survey – both in terms of financial literacy questions and in terms of demographic and control variables – remained limited. Numerous other financial literacy surveys were adopted at the national level. Most of these surveys share the common weakness that they lack theoretical foundations and cover only limited dimensions (see e.g. Aprea and Wuttke, 2016).

About a decade ago, the OECD’s International Network on Financial Education (INFE) started an ambitious project to design an extensive blueprint survey on adult financial literacy, the so-called Toolkit for measuring financial literacy and financial inclusion (OECD, 2015), with the aim of rolling it out in a decentralized way to its member countries and other countries participating in the INFE. After a pilot study in 2010/2011, the first regular survey wave in 2014/2015 covered about 35 countries on different continents and at different levels of development, including Austria. The design of the OECD/INFE survey follows the OECD’s approach of defining financial literacy as “a combination of financial awareness, knowledge, skills, attitude and behavior necessary to make sound financial decisions

<sup>2</sup> The three questions are: (1) Suppose you had USD 100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: [more than USD 102; exactly USD 102; less than USD 102; do not know; refuse to answer]; (2) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy: [more than, exactly the same as, or less than today with the money in this account; do not know; refuse to answer]; (3) Do you think that the following statement is true or false? “Buying a single company stock usually provides a safer return than a stock mutual fund.” [true; false; do not know; refuse to answer].

and ultimately achieve individual financial wellbeing” (Atkinson and Messy, 2012). The questionnaire therefore covers not only financial knowledge but also several aspects of financial behavior and attitudes. One of the strengths of the OECD’s approach – in addition to providing data – is that it constructs a set of financial literacy scores from the individual survey questions to allow international rankings. The descriptive results were published in OECD (2016) and OECD (2017), while analysis and research papers based on the Austrian contribution (the ASFL 2014) were summarized in Silgoner et al. (2015) and Cupak et al. (2018).

In spring 2019, the OECD repeated the exercise. Countries were expected to deliver national data by spring 2020. The OeNB again participated in the exercise. This article describes the first results from the second wave of the Austrian Survey of Financial Literacy (ASFL 2019). We investigate the current state of financial knowledge, behavior and attitudes in Austria, highlighting also – wherever possible – changes as compared to the previous survey round. We explore differences among sample subgroups by gender, education and age, with a special focus on the subgroup of millennials.

Throughout this article, we split the sample into age bands, for convenience giving each of them customary labels. Such sample splits and labels are by nature arbitrary, as there is no universally accepted definition of generations. We refer to millennials as the demographic cohort born after 1980, also known as Generation Y. Most of the time, we divide this group further into young millennials (age 15–28) and old millennials (age 29–38). Generation X (age 39–58) are those born in the 1960s and 1970s. The rest of the sample either belong to the baby boomers (age 59–74) or the silent generation (age 75+), i.e. those born before the end of World War II.

This article is structured as follows: In section 1, we describe the dataset and the OECD’s financial literacy scores. Section 2 presents the key results from the ASFL 2019. Section 3 focuses on the results for millennials and investigates special characteristics of this group, and section 4 concludes.

## 1 Dataset and calculation of scores

This article is based on the ASFL 2019, the Austrian contribution to the second wave of the regular OECD/INFE financial literacy survey. It was conducted by the OeNB among about 1,500 Austrian residents in spring 2019.

Box 1

### The survey setting – some technical details

*The sample used in the ASFL was based on stratified multistage clustered random sampling. NUTS 3 regions, municipality size as well as districts in Vienna were used for regional stratification. Replacement of unit nonresponse by drawing new addresses was allowed. Ultimately, the gross sample consisted of 3,356 households (3,201 after neutral dropouts). Respondents within households were drawn randomly. The final net sample comprised 1,418 computer-assisted personal interviews (CAPIs) conducted in April and May 2019. The nonresponse rate was about 55.7%. We used survey weights to produce descriptive population statistics throughout the article. The weights consist of a combination of (sample) design weights and poststratification weights based on external population statistics on age and gender at the province level.*

The survey questionnaire is based on the OECD toolkit (OECD, 2018), but as in 2014, the OeNB included several additional survey questions that are of special

interest for the Austrian case. The complete set of financial knowledge questions is reported in box 2; the remainder of the questionnaire, including financial behavior and attitude questions, is available from the authors upon request.

According to OECD methodology (OECD, 2018), the survey data are used to calculate a set of financial literacy scores:

- The *financial knowledge score* is given by the total number of financial knowledge questions answered correctly (as opposed to a wrong answer, “don’t know” or “refused to answer”) out of the seven questions marked with an asterisk (\*) in box 2. The score ranges from 0 to 7.
- The *financial attitude score* is based on a set of three statements (“I find it more satisfying to spend money than to save it for the long term,” “Money is there to be spent,” “I tend to live for today and let tomorrow take care of itself”). Respondents are asked how much they agree with a statement on a scale from 1 to 5, where 1 indicates “completely agree” and 5 “completely disagree.” The financial attitude score is the arithmetic average agreement with the three statements and ranges from 1 to 5.
- The calculation of the *financial behavior score* is far more complex. It is based on a total set of ten questions that cover several aspects: active participation in financial decisions, savings behavior, product comparison and information sources before taking financial decisions, money management and financial planning. The financial behavior score ranges from 0 to 9. For details of the calculation, see annex A in OECD (2018).
- The total *financial literacy score* simply adds up these three scores, so it can take a maximum value of 21. This corresponds to the OECD/INFE approach that all three aspects of financial literacy in the end contribute to financial wellbeing.

Box 2

### Financial knowledge questions in the survey

The ASFL 2019 covers 10 questions on financial knowledge. Questions used to calculate the OECD’s financial knowledge score are denoted with an asterisk. The correct answers are indicated in brackets after each question. In addition to the various answer choices, participants could refuse to respond or state that they don’t know the answer. Overall, the mix of questions – multiple choice questions, true/false questions and questions requiring respondents to do some math – is in line with common recommendations to design surveys in a way that they work equally well for respondents, regardless of their socioeconomic background, gender or culture.

**Time value of money<sup>3</sup> (\*):** Five brothers receive a gift of EUR 1,000 in total and are asked to share the money equally. Imagine that the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays at around 2%. In one year’s time, will they be able to buy (a) more with their share of the money than they could today, (b) the same amount or (c) less than they could buy today? **(c)**

**Interest paid on a loan (\*):** You lend EUR 25 to a friend one evening and he gives you EUR 25 back the next day. How much interest has he paid on this loan? **(0)**

**Interest plus principal (\*):** Imagine that someone puts EUR 100 into a no fee savings account with a guaranteed interest rate of 2% per year. They don’t make any further payments into this account and they 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? **(EUR 102)**

<sup>3</sup> As presented here, this question contains information taken from an introductory knowledge question which is not among the set of questions used to calculate the OECD’s financial knowledge score. See annex 2 for the two questions actually put to respondents.

**Compound interest (\*):** And how much would be in the account at the end of five years? Would it be (a) more than EUR 110, (b) exactly EUR 110, (c) less than EUR 110 or (d) impossible to tell from the information given? **(a)**

**Risk and return (\*):** Is the following statement (a) true or (b) false? An investment with a high return is likely to be high risk. **(a)**

**Definition of inflation (\*):** Is the following statement (a) true or (b) false? High inflation means that the cost of living is increasing rapidly. **(a)**

**Diversification (\*):** Is the following statement (a) true or (b) false? It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares. **(a)**

**Real interest:** Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year: After 1 year, how much would you be able to buy with the money in this account (disregarding any bank fees)? Would it be (a) more than today, (b) the same amount or (c) less than today? **(c)**

**Overdrawing an account:** Is the following statement (a) true or (b) false? It usually does not matter whether I overdraw my checking account or take out a loan because in both cases the interest rates do not differ significantly. **(b)**

**Exchange rate:** Suppose you have taken out a loan in Swiss francs. Then the euro depreciates against the Swiss franc. How does this change the amount of euro you need to make your loan installments? Does it (a) increase, (b) stay exactly the same or (c) decrease? **(a)**

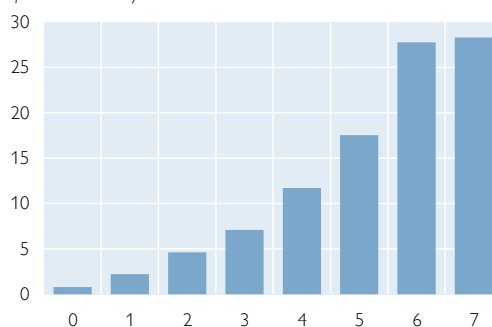
Simplifications tend to come with some drawbacks. For example, asking people about interest rates or inflation may not really give an accurate picture of their real-life ability to take sound economic and financial decisions. Furthermore, the distinction between financial behavior and attitude is sometimes not clear cut. Also, calculating the total financial literacy score as the sum of the other three scores leads to some sort of double-counting: If we expect knowledge to impact on behavior, we would expect people with a high financial knowledge score to also show high financial behavior scores (see e.g. Fessler et al., 2019). This way, people with sound financial knowledge are credited twice for this advantage.

These caveats need to be kept in mind, especially when interpreting cross-country differences in the OECD's financial literacy scores. They share a common feature of most internationally comparable data sets: The methodology is always a compromise to account for the different traditions, conditions and circumstances in place in a wide range of countries. The attempt to make data suit all purposes may lead to data not fully matching national needs in the end. The World Bank, for example, follows a different, outcome-driven approach to designing national financial literacy programs (e.g. Holzmann et al., 2013). In line with its behavior-oriented definition of financial capability, the World Bank identifies country-specific key vulnerabilities and challenges of the financial system to develop a well-targeted set of measures. The Austrian approach is somewhere in between in that it relies on the OECD's methodology but extends the scope of the survey in directions that are of special importance for Austria.

Chart 2

### OECD financial knowledge score

Percentage share of respondents who answered x financial knowledge questions correctly



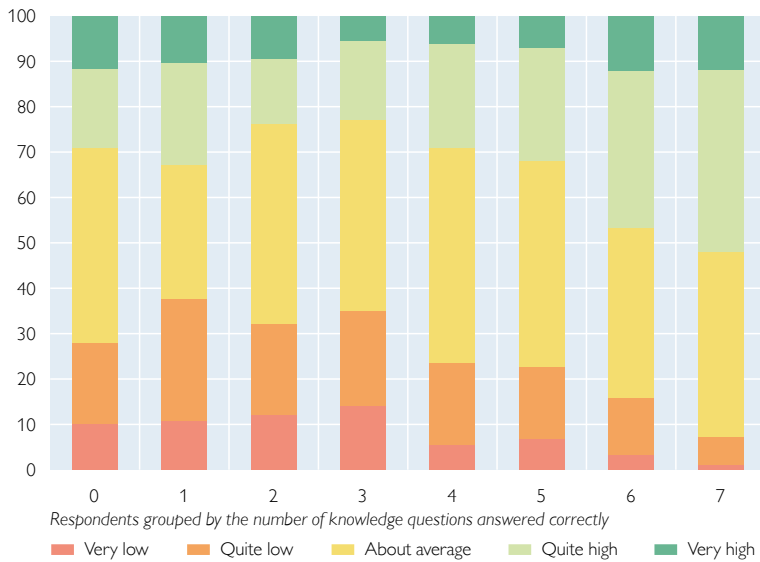
Source: ASFL 2019, OeNB.

Chart 3

### Self-assessment of financial knowledge by knowledge score achieved

**Question asked: How would you rate your overall knowledge about financial matters compared with other adults in Austria?**

Percentage share of each answer



Source: ASFL 2019, OeNB.

## 2 Key results from the ASFL 2019

### 2.1 Knowledge gaps are largest for the youngest, the oldest and women

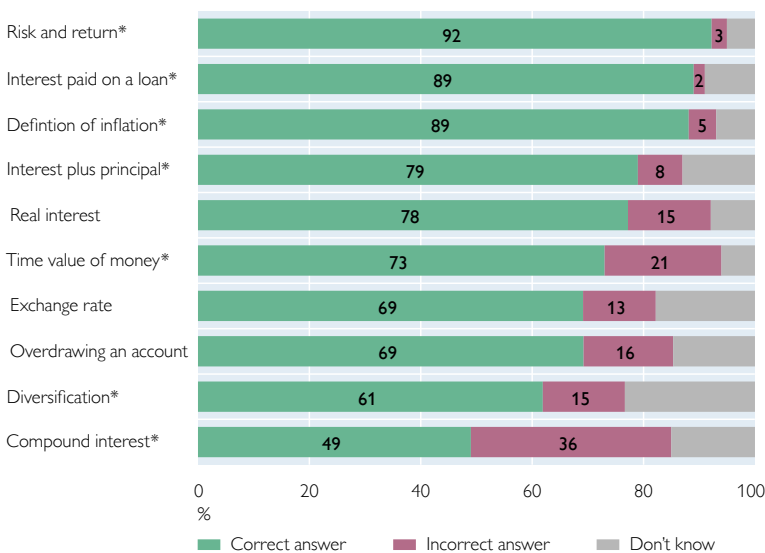
Chart 2 shows the distribution of the financial knowledge score for Austria. The bars indicate the share of respondents who get a specific financial knowledge score, defined as the number of financial knowledge questions answered correctly from the list of items denoted with an asterisk in box 2, i.e. those questions that the OECD uses to calculate the financial knowledge score.<sup>4</sup>

More than one-half of respondents perform rather well – they answered all (or almost all) knowledge questions correctly. 28% of respondents get the highest possible financial knowledge score of 7. On the other hand, a non-negligible share of respondents (15%) show a rather poor performance, answering less than four questions correctly. This is a source of concern, especially since none of the questions require expert knowledge, but all of them are essential when dealing with standard financial products. We therefore see scope for improvement.

At the same time, people are not fully aware of their knowledge gaps. We asked people to rate their own knowledge about financial matters as compared with other adults in Austria on a scale from 1 to 5 (1 stands for “very high,” 5 for “very low”). Respondents were asked to answer this question before starting the knowledge quiz so we would get an idea of their self-assessment, unaffected by their actual performance. Chart 3 shows that people have a tendency towards overconfidence in their own financial knowledge. What is of special concern is the high share of those who answered less than three

Chart 4

### Answers to the 7 OECD and 3 additional knowledge questions



Source: ASFL 2019, OeNB.

Note: Questions used to calculate the OECD's financial knowledge score are denoted with an asterisk.

<sup>4</sup> The question on compound interest is only counted as answered correctly if the answer to the question on interest plus principle is also accurate.



Table 1

**Means of financial literacy scores across personal socioeconomic characteristics**

	Unweighted sample size	Knowledge	Behavior	Attitude	Literacy (sum)
<b>Age</b>					
Young millennials (15–28)	158	5.0	5.5	2.7	<b>13.2</b>
Old millennials (29–38)	198	5.3	5.9	3.1	<b>14.3</b>
Generation X (39–58)	515	5.4	6.1	3.2	<b>14.8</b>
Baby boomers (59–74)	354	5.4	5.8	3.2	<b>14.4</b>
Silent generation (75+)	193	5.2	5.5	3.1	<b>13.9</b>
<b>Gender</b>					
Male	668	5.6	5.8	3.1	<b>14.5</b>
Female	750	5.1	5.9	3.2	<b>14.1</b>
<b>Education</b>					
Primary	744	5.0	5.5	3.0	<b>13.6</b>
Secondary	512	5.5	6.2	3.2	<b>14.9</b>
Tertiary	162	6.1	6.3	3.1	<b>15.6</b>
<b>Job</b>					
Self-employed, business owner	101	6.1	6.4	3.1	<b>15.6</b>
White collar worker	737	5.5	6.0	3.2	<b>14.6</b>
Public servant	115	5.5	6.1	3.3	<b>14.9</b>
Farmer	31	5.0	5.8	3.3	<b>14.1</b>
Blue collar worker	391	4.9	5.5	3.0	<b>13.4</b>
Homemaker	8	5.1	4.0	2.9	<b>12.0</b>
Overall mean		5.3	5.8	3.0	<b>14.2</b>
<b>Possible maximum</b>		<b>7</b>	<b>9</b>	<b>5</b>	<b>21</b>

Source: ASFL 2019, OeNB.

questions correctly (bars 0 to 2 in chart 3) and nevertheless believe that their financial knowledge is “quite” or “very” high compared with that of other adults in Austria (light and dark green areas, respectively). Overconfidence can breed risky financial behavior.

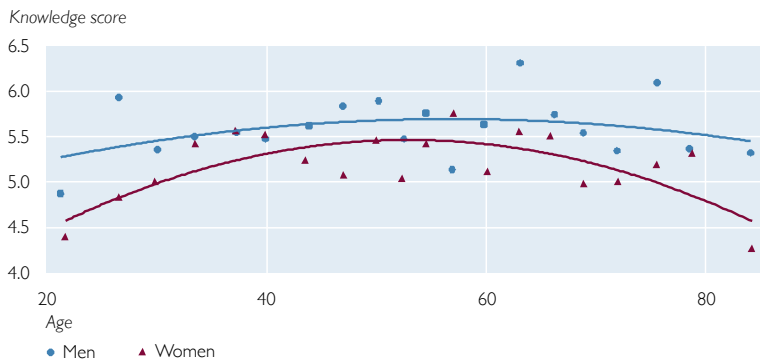
Chart 4 shows in more detail how respondents perform on the knowledge questions. The questions without an asterisk are Austria-specific and were added to the existing OECD toolkit. Note that the OECD financial knowledge score, which we also use in this study, focuses entirely on the number of questions answered correctly and thereby largely ignores the difference between “don’t know” – indicating awareness of one’s own knowledge – and a wrong answer.

Most respondents manage to give the correct answer to rather simple questions, like the one on the link between risk and return. However, while most (89%) know that high inflation means that the cost of living is increasing rapidly, one-quarter of respondents do not understand that you can buy less with the same amount of money after one year of inflation (time value of money). About 30% do not understand the implications of exchange rate movements for foreign currency debt, and the same fraction is not aware that overdrawing an account is far more costly than taking out a loan. Only about 60% of respondents grasp the key principle of risk diversification, and the concept of compound interest is understood by less than one-half of respondents.

Table 1 provides a breakdown of the average financial knowledge score by age, gender, education or job status. The first column shows unweighted numbers of

Chart 5

**Relationship between age and level of knowledge**



Source: ASFL 2019, OeNB.

observations.<sup>5</sup> Splitting the sample by gender, we observe that men significantly outperform women in terms of financial knowledge – a common finding in the international literature. The average financial knowledge score of men is 5.6, while that of women is only 5.1. Greimel-Fuhrmann and Silgoner (2017) used ASFL 2014 data to investigate the potential reasons behind the comparatively weak performance of women. They identified a mix of determinants, including differences in personal endowments (such as education or income), the level of interest and involvement in

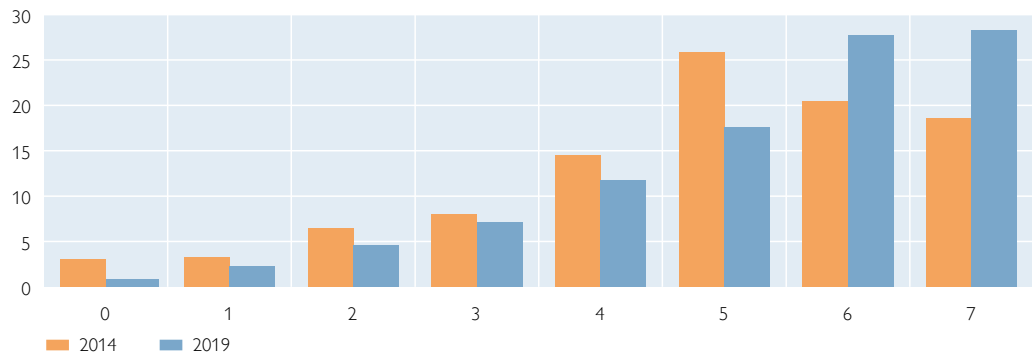
financial matters as well as gender differences in the answer behavior in survey settings.<sup>6</sup> Especially the level of personal involvement in financial decisions seems to be crucial: Greimel-Fuhrmann and Silgoner (2017) do not find a gender gap when focusing on respondents who are widowed or divorced or live in single-person households and presumably are alone responsible for their financial decisions.

Table 1 also shows that knowledge is lowest in the youngest age cohort (referred to as young millennials in the following). Chart 5 gives more insight into the link between age and the knowledge score: In this binned scatter plot, the blue dots (men) and red triangles (women) each represent 5% of the respective sample and show the average knowledge score for each age bin. The chart confirms, for both women and men, the typical inverse U-shaped relationship described in the literature, indicating that people in the middle of their professional careers score highest in terms of financial knowledge. Young people, who have not yet acquired that much

Chart 6

**OECD financial knowledge score: ASFL 2014 vs. ASFL 2019**

Percentage share of respondents who answered x financial knowledge questions correctly



Source: ASFL 2014 and ASFL 2019, OeNB.

<sup>5</sup> Note that for job status, the overall number is lower than the full sample, as 35 respondents who report that they have never held a job (to date) are excluded. In addition, the data on very small subgroups such as homemakers or farmers do not allow any interpretation, as the precision of the resulting estimates is very low.

<sup>6</sup> Women admit more often than men that they don't know the answer instead of just taking a guess.



experience with financial products and business life in general, perform comparatively poorly. The same is true for the oldest age cohorts, who are used to very standard and safe financial products, such as savings books, and who never invested in financial knowledge. The red line in chart 5 also shows that these age effects are more pronounced for women than men. This evidence calls for financial education initiatives that focus on young people as well as targeted training programs for women.

Finally, table 1 shows – not surprisingly – that financial knowledge increases with the level of education. Self-employed people tend to score highest in terms of financial knowledge.

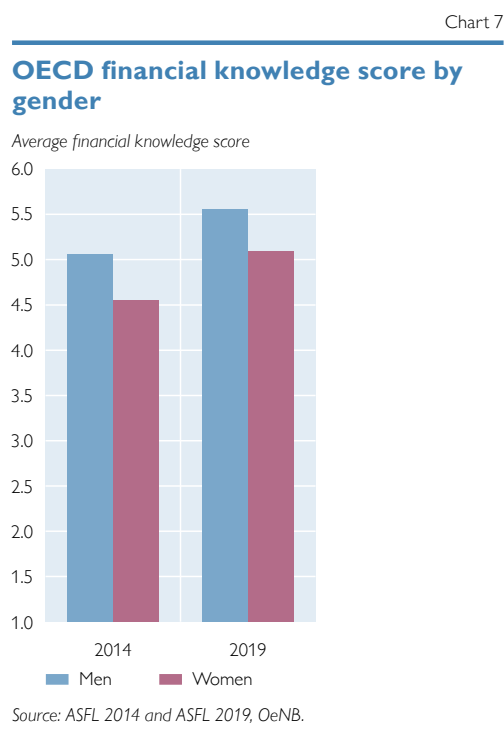
## 2.2 Financial literacy has improved from 2014

Chart 6 compares the financial knowledge score results from the two survey rounds, the ASFL 2014 (orange) and the ASFL 2019 (blue).<sup>7</sup> Again, the bars show the share of respondents exhibiting a specific financial knowledge score, defined as the number of financial knowledge questions answered correctly.

A comparison of the orange and blue bars in chart 6 shows that financial knowledge has increased significantly over the last five years. In 2019, 28% of respondents were able to answer all seven questions correctly, as compared to only 19% in 2014. About three-quarters of respondents gave the right answer to at least five questions, which the OECD considers a minimum target, as compared to only 65% in 2014. On average, people today give the correct answer to about half a question more than in the ASFL 2014. This improvement is not due to composition effects, such as a higher share of men or university graduates within the samples. Today, respondents score significantly better than in 2014 for all questions except the one about risk diversification. See chart A1 in annex 1 for regression results, which confirm that the differences between 2014 and 2019 are statistically significant at the 5% level for almost all individual questions and remain so even if we control for a set of socioeconomic covariates.

A comparison of the two survey waves shows that both men and women accumulated knowledge (chart 7), but women improved more than men (12% and 10%, respectively), which helps reduce the gender gap somewhat. Improvements were also observed for all levels of education and all age groups.

From the survey alone, it is impossible to derive definitive explanations for the improvement in financial knowledge

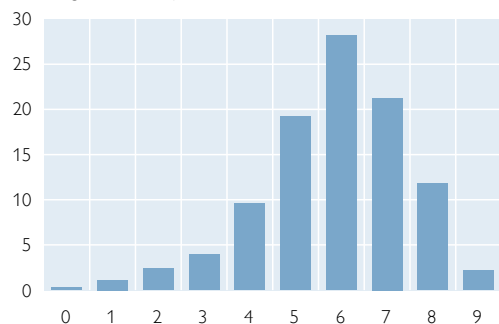


<sup>7</sup> As outlined in annex 2, the questionnaire used for the 2019 wave differed slightly from the questionnaire used for the 2014 wave with regard to two questions. However, we do not see these slight adjustments to constrain the comparability of the results from the two waves.

Chart 8

**OECD financial behavior score**

Percentage share of respondents with a score of x



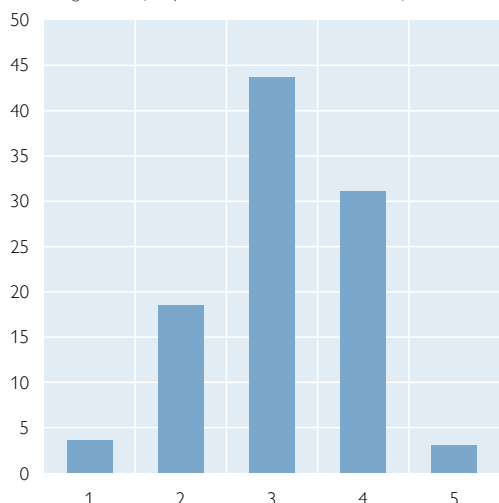
Source: ASFL 2019, OeNB.

such as deep recession, high unemployment, private and public debt and persistently low inflation. Economic and monetary policy reactions as well as their limitations (overindebtedness, zero lower bound of monetary policy, effectiveness of unconventional monetary policy measures) were also widely discussed. The intensive financial education initiatives launched in Austria by the OeNB and other key stakeholders of financial education may have contributed to this improvement. But these effects are hard to isolate, given the long-term orientation of most education initiatives.

Chart 9

**OECD financial attitude score**

Percentage share of respondents with a rounded score of x



Source: ASFL 2019, OeNB.

over time. One hypothesis (that would need to be confirmed with further research, however) could be that the extensive media coverage of challenges related to the financial and economic crisis that started in 2008 has sparked people's interest in core economic concepts, so they have become more knowledgeable about them. After all, Norvilitis et al. (2006) found that financial knowledge, unlike financial behavior and attitudes, is very susceptible to changing external conditions. All types of news media focused on the major economic challenges associated with the crisis,

### 2.3 Population rather prudent, forward oriented and risk averse

The distribution of the financial behavior score, as measured by OECD methodology,<sup>8</sup> is tilted to the right, indicating that Austrian residents self-report rather positive financial behavior (chart 8). The distribution of the financial attitude score is shown in chart 9.

Again, we find interesting differences across sociodemographic subgroups (table 1). While men outperformed women in terms of financial knowledge, women scored better in terms of behavior and attitudes (although the difference is significant only for attitudes). One of the questions investigated in Greimel-Fuhrmann and Silgoner (2017) was how this difference affects financial

<sup>8</sup> The methodology for calculating the financial behavior score has changed from 2015. Comparing the scores of the two survey rounds is therefore not feasible.

wellbeing. The authors use the period of time that people would get by after losing their main source of income as a proxy for financial wellbeing and find no gender gap there. Apparently, there are different ways of achieving the same level of financial wellbeing: Women may partly compensate a lack of knowledge with extra prudent and forward-looking behavior, while men – equipped with a higher level of financial knowledge – can potentially afford more risky behavior. But causality may also run in the other direction: The more willing individuals are to take risk, the higher might be their incentive to invest in knowledge so they can assess risks properly.

Chart 10 summarizes the information provided in table 1 on the three scores for the different age cohorts. Generally, financial literacy seems to be rather equally distributed across generations. However, all three scores peak for Generation X, i.e. people in the middle of their professional career (age 39–58). The lowest scores in all three dimensions of financial literacy are achieved by the youngest age group (young millennials), followed by the silent generation. Overall, this mirrors the slight inverse U-shape we see for financial knowledge in chart 5 for the other two financial literacy scores. Given the increasing complexity of financial decisions and the enormous financial resources millennials will eventually inherit, monitoring the development of their financial literacy seems reasonable.

Finally, table 1 shows that respondents with only primary education show especially poor results in all three dimensions of financial literacy. Since it is often difficult to reach people once they have left school, financial education initiatives should be targeted at young people, e.g. students in primary and lower secondary school. Table 1 shows that business owners and the self-employed score highest in terms of both financial knowledge and behavior.

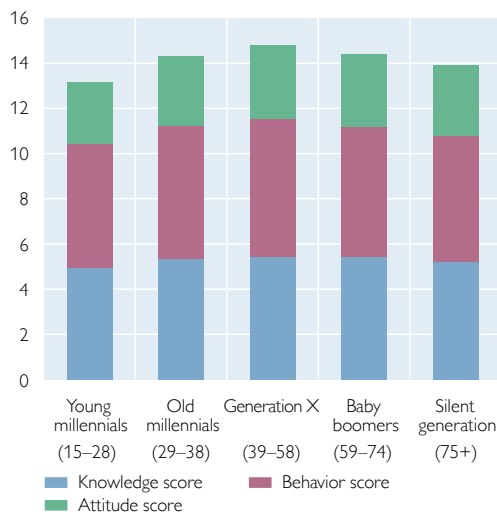
As described in section 1, the OECD calculates the total financial literacy score as the sum of the financial knowledge, behavior and attitude scores. Austria's total score in the ASFL 2019 was 14.2 (out of 21; bottom of table 1) – the very score Austria achieved five years earlier in the ASFL 2014. Back then, Austria scored slightly above the average of participating OECD countries (OECD, 2016). The unchanged total financial literacy score masks improved results for financial knowledge (5.3 as compared to 4.9) but poorer results for financial behavior (5.8 as compared to 6.0) and attitudes (3.1 as compared to 3.3). However, as mentioned earlier, the methodology behind the calculation of the financial behavior score has changed somewhat from 2014.

Chart 11 highlights selected aspects of financial behavior and attitudes. The bars show the average level of agreement to a number of statements on a scale of 1 to 5, where 1 indicates “I fully agree” (or for some questions: “It always applies” or “It

Chart 10

### Financial literacy across generations

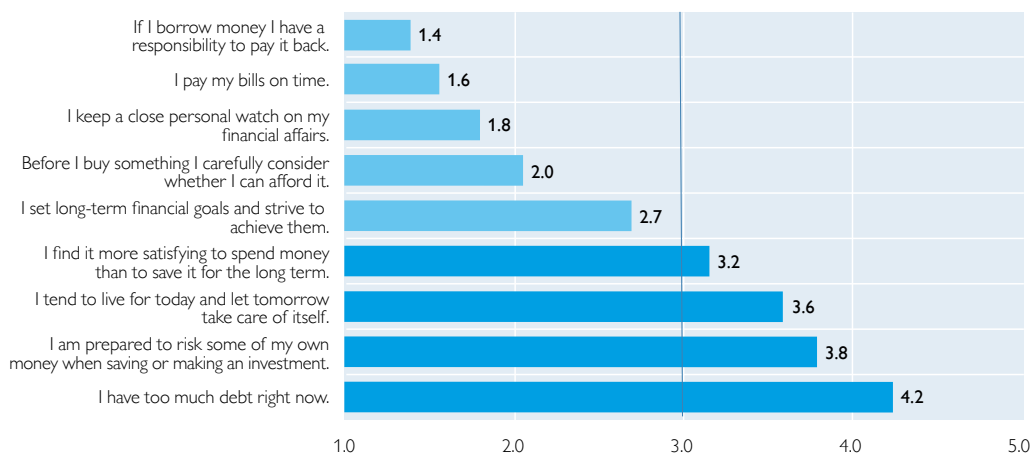
Average financial literacy scores



Source: ASFL 2019, OeNB.

**Selected aspects of financial behavior and attitudes (1)**

Average agreement with statements on a scale from 1 to 5 (1 = completely agree/always applies, 5 = completely disagree/never applies)



Source: ASFL 2019, OeNB.

completely describes my situation”) and 5 “I completely disagree” (or “It never applies” or “It does not describe my situation at all”).

Chart 11 shows that Austrian residents are rather prudent and forward oriented. Respondents understand that they have to pay back borrowed money (score of 1.4), they pay their bills on time (1.6), and they state that they keep a close watch on their financial affairs (1.8). Most of them also consider purchases carefully (2.0). In all these cases, women report more favorable behavior, i.e. indicate even stronger agreement with the statement. Most people state that they set long-term financial goals (2.7) and strive to achieve them. Likewise, the majority of respondents claim that they do not find it more satisfying to spend money than to save for the long term (3.2) and that they do not live for today and let tomorrow take care of itself (3.6). Survey participants are generally hesitant to risk money when saving or investing (3.8), with women being even more risk averse. Only a minority seems to feel overindebted (4.2).

From other questions (not shown in the chart), we can conclude that people have confidence in the financial system. A score of 2.3 shows that respondents mostly trust financial service providers to treat them fairly. However, Austrian residents are generally rather skeptical when it comes to financial innovations. When asked whether they use their mobile phone to make or receive payments, the average score is 3.8, which means that the majority of respondents answered in the negative. The level of disagreement is more pronounced among women (3.9) than among men (3.6). People are even more skeptical of crypto assets: The average score for the statement that now is a good time for people to invest in crypto assets or initial coin offerings (ICOs) is only 4.1; i.e. people strongly disagree, especially women.

As part of the survey, we also ask whether people believe that ethical standards are important for the financial system. People mostly agree that banks should check the ethics of companies before providing them with banking services (average score of 2.0). They also declare that they prefer to use financial companies that

have a strong ethical stance (average score of 2.2). However, they also think that it should be more important for investors to choose companies that are making a profit than to choose companies that are minimizing their impact on the environment (average score of 2.3). In all three dimensions, the ethical stance of a bank or a company seems to be more of an issue for females than for males.

When interpreting these rather positive results on the ethical conscience of Austrian residents, we should keep in mind that respondents are often affected by social desirability bias in survey settings, which means they tend to give answers that they believe will be viewed favorably by others. Also, respondents tend to agree with offered statements (acquiescence bias). The fact that survey participants would like to see banks follow strong ethical standards, while at the same time agreeing that financial aspects should take precedence over environmental considerations for investors, seems to confirm that some acquiescence bias is involved. To gain deeper insights into people's ethical conscience, it would be necessary to thoroughly investigate how much they actually know about ethical goals and standards and what they are willing to do about them (actual personal purchase and investment patterns). There may be substantial gaps between stated preferences and actual behavior.

### 3 Millennials are different...

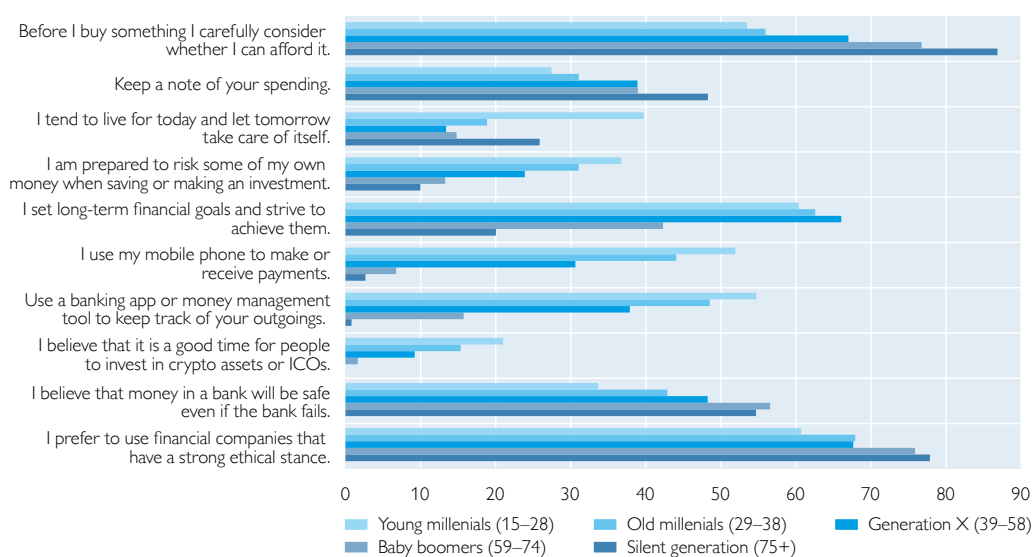
Millennials are commonly perceived as being different from older age cohorts in many respects, including their savings and investment behavior, their perception of risks and their openness to technical and financial innovations.

In this respect, table 1 and chart 10 already revealed that the youngest participants in the 2019 survey scored relatively low in terms of both financial knowledge and financial behavior and attitudes. Let us now shed more light on how precisely millennials are different from other generations in terms of financial behavior and

Chart 12

#### Selected aspects of financial behavior and attitudes (2)

Percentage share of respondents who completely or somewhat agree with the statement



Source: ASFL 2019, OeNB.

attitudes and what implications this may have for financial stability. We deliberately abstract here from questions that are directly linked to the financial situation (such as whether respondents have a large financial buffer), given that millennials are still at an early stage of their professional career and at the beginning of their earnings cycle. Chart 12 shows the share of respondents who (completely or at least somewhat) agree with a given statement.<sup>9</sup>

We observe the following fundamental differences between millennials (i.e. those younger than 39) and older age cohorts:

- Overall, millennials tend to be less financially organized. From chart 12 we see that the share of respondents who carefully consider whether they can afford a purchase is much lower among young and old millennials than among other age cohorts. Similarly, and in spite of their probably smaller income, they have a lower tendency to keep track of spending or follow alternative budgeting habits (e.g. keeping money for bills separate from day-to-day spending money or keeping track of bills; not shown in the chart). Similar results were reported e.g. by Wuttke and Aprea (2018).
- Millennials also seem to be less risk averse and forward looking, as shown by the relatively high share of agreement with “I tend to live for today and let tomorrow take care of itself” and “I am prepared to risk some of my own money when saving or making an investment,” as compared with Generation X and baby boomer respondents. In both cases, young millennials stand out clearly, which is also confirmed by the answers to a question designed to establish respondents’ risk aversion:<sup>10</sup> Among (young and old) millennials, the share of those not willing to take any financial risk when making savings or investment decisions is only about 45%, as compared to 56% for Generation X and 78% of baby boomers (not shown in the chart).
- Interestingly, however, millennials are not markedly different from Generation X when it comes to long-term financial goals. All three age cohorts state that setting long-term financial goals and striving to achieve them is important to them. Apparently, there is a mismatch between people’s awareness of the importance of long-term goals and their focus on the short-term steps necessary to achieve them.
- Millennials are more likely to use new – specifically financial – technologies than the other age groups: While more than one-half of young millennials and 44% of old millennials declare that they use their mobile phone to make or receive payments, this share declines markedly with age: Only about 30% of Generation X and less than 10% of baby boomer respondents use this payment option. We observe a similar pattern when asking whether respondents use a banking app or money management tool to keep track of their outgoings. Interestingly, this is another discrepancy to what we reported in the first bullet point: Even though they use new financial technologies such as banking apps, millennials are less financially organized. Apparently, users are unable to fully absorb the wealth of information provided by new financial technologies. When it comes to

<sup>9</sup> For some questions, it is the share of respondents who declare that the statement always or often applies to them.

<sup>10</sup> Question: If your household has to make saving or investment decisions: Which of the following statements best describes your household’s attitude toward risks? (a) I am prepared to take substantial financial risks expecting to earn substantial returns, (b) I am prepared to take above-average financial risks expecting to earn above-average returns, (c) I am prepared to take average financial risks expecting to earn average returns, (d) I am not willing to take any financial risk.



crypto assets, the share of respondents who believe that right now would be a good time to invest in crypto assets or ICOs is low in general, but again markedly higher among millennials.

Summarizing this evidence, we conclude that millennials show more risky and less forward looking behavior than other age groups. The use of new financial technologies may not necessarily help them keep track of their finances. Interestingly, millennials have less trust in the banking system than the other age groups, as indicated by the responses to the second to last question in chart 12 (“I believe that money in a bank will be safe even if the bank fails.”).

Finally, let us come back to the questions on the ethical conscience of respondents. Given that the recent climate change protests were kickstarted by the very young generation of school and university students, we would also expect above-average support for aspects related to green finance among millennials. However, as indicated by the last item in chart 12, the level of agreement with the statement “I prefer to use financial companies that have a strong ethical stance” appears to increase with age. A similar picture emerges for whether banks should check the ethics of companies before providing them with banking services (not shown in the chart). Apparently, people become aware of the financial aspects of environmental concerns only once they start making investment decisions themselves, i.e. at a later stage in the earnings cycle.

#### 4 Conclusions from the perspective of a major financial education provider

In spring 2019, for the second time after 2014, the OeNB conducted a survey on financial knowledge, behavior and attitudes in Austria (ASFL 2019), the Austrian contribution to the OECD/INFE survey on adult financial literacy. We find that more than one-half of respondents perform relatively well in a financial knowledge quiz – they were able to correctly answer all (or almost all) seven knowledge questions. As compared to the previous survey round in 2014, financial knowledge has increased. While men significantly outperform women in terms of financial knowledge, they score slightly worse in terms of financial behavior and attitudes. Austrian residents are rather prudent, risk averse and forward looking and have a good overview of their finances. Survey participants have confidence in the financial system and believe that ethical standards are important, but are rather skeptical when it comes to financial innovations.

Millennials (those younger than 39 years) differ from other age cohorts in several respects: They have relatively low levels of financial literacy, are less financially organized, show more risky and less forward looking behavior, but are more open to digital means of payments and financial innovations in general. Even though the observed differences are not very large and may vanish as millennials mature and gain experience with business and finance, we deem it important to monitor the development of financial literacy for this group, given the rising complexity of financial decisions many of them will face. We are confident that further research and future surveys will reveal whether millennials are intrinsically different from other cohorts, or merely younger.

These first results highlight promising routes for future research. First, it would be interesting to explore why people performed better in the 2019 financial knowledge test than in the 2014 test. We hypothesize that most people in Austria

were affected by the financial crisis that started in 2008, which underscored e.g. the value of having financial buffers, even in a zero interest environment. The extensive coverage of crisis-related topics in all types of media may have contributed to people's interest in, and knowledge of, core economic concepts. However, such a hypothesis would need to be verified with a separate survey.

Second, the benefits of sound financial knowledge increase when it actually leads to healthier financial behavior. Fessler et al. (2019) identified a significantly positive and causal link between financial knowledge and behavior based on the ASFL 2014. The 2019 survey now offers new information to re-investigate this link.

Finally, with regard to the affinity of millennials to new financial technologies, our survey data allow us to replicate research by Lusardi et al. (2017). They find that millennials in the U.S.A. who regularly use their mobile phone for financial services tend to be less financially literate and (probably therefore) tend to more often display expensive financial behavior (such as overdrawing their checking account or getting costly cash advances from their credit cards) than nonusers of the same age group. A first analysis shows that the evidence from Austria does not follow this pattern, but further analysis would be needed to dig deeper into the issue.

At any rate, millennials will constitute the core of active financial market participants at some point, so a profound understanding of their preferences and financial literacy deficiencies is essential to evaluate future financial stability risks and tailor financial education initiatives to vulnerable groups who need them most.

## References

- Alsemgeest, L. 2015.** Arguments for and against financial literacy education: Where to go from here? In: *International Journal of Consumer Studies* 39(2). 155–161.
- Aprea, C. and E. Wuttke. 2016.** Financial Literacy of Adolescents and Young Adults: Setting the Course for a Competence-Oriented Assessment Instrument. In: Aprea, C., E. Wuttke, K. Breuer, N. K. Koh, P. Davies, B. Greimel-Fuhrmann and J. S. Lopus (eds.). *International Handbook of Financial Literacy*. Chapter 27. 397–414.
- Atkinson, A. and F.-A. Messy. 2012.** Measuring Financial Literacy: Results of the OECD/International Network on Financial Education (INFE) Pilot Study. *OECD Working Papers on Finance, Insurance and Private Pensions* 15. OECD Publishing.
- Cupak, A., P. Fessler, M. Silgoner and E. Ulbrich. 2018.** Financial literacy in Austria: a survey of recent research results. *Monetary Policy and the Economy* Q1/18. OeNB. 14–26.
- Fessler, P., M. Silgoner and R. Weber. 2019.** Financial knowledge, attitude and behavior: evidence from the Austrian Survey of Financial Literacy. *Empirica*. Forthcoming.
- Greimel-Fuhrmann, B. and M. Silgoner. 2017.** Finanzwissen und finanzielles Wohlbefinden – Frauen sind nicht grundsätzlich im Nachteil. *DIW-Vierteljahresheft zur Wirtschaftsforschung* 04.2017. 123–136.
- Hilgert, M. A., J. M. Hogarth and S. G. Beverly. 2003.** Household financial management: The connection between knowledge and behavior. In: *Federal Reserve Bulletin* 89 (July). 309–322.
- Holzmann, R., F. Mulaj and V. Perotti. 2013.** Financial capability in low- and middle-income countries: measurement and evaluation. The World Bank.
- Lusardi, A. and O. S. Mitchell. 2008.** Planning and Financial Literacy: How Do Women Fare? In: *American Economic Review* 98(2). 413–417.
- Lusardi, A., C. de Bassa Scheresberg and M. Avery. 2017.** Millennial Mobile Payment Users: A Look into their Personal Finances and Financial Behaviors. *GFLEC Insights Report*.

- Norvilitis, J., M. Merwin, T. Osberg, P. Roehling, P. Young and M. Kamas. 2006.** Personality factors, money attitudes, financial knowledge, and credit-card debt in college students. In: Journal of Applied Social Psychology 36(6). 1395–1413.
- OECD. 2015.** 2015 OECD/INFE toolkit for measuring financial literacy and financial inclusion. March.
- OECD. 2016.** OECD/INFE International Survey of Adult Financial Literacy Competencies.
- OECD. 2017.** G20/OECD INFE report on adult financial literacy in G20 countries.
- OECD. 2018.** OECD/INFE toolkit for measuring financial literacy and financial inclusion. May.
- Silgoner, M., B. Greimel-Fuhrmann and R. Weber. 2015.** Financial literacy gaps of the Austrian population. Monetary Policy and the Economy Q2/15. OeNB. 35–51.
- Wuttke, E. and C. Aprea. 2018.** A situational judgement approach for measuring young adults' financial literacy. Empirische Pädagogik 32(3/4). 272–292.

## Annex 1

Chart A1 shows differences between the 2014 and 2019 waves of the ASFL survey in the probabilities of answering knowledge questions correctly. Error bars denote 95% confidence intervals. To produce this graph, we ran 14 regressions, 2 for each question, and estimated the probability of answering the question correctly using a linear probability model. Both waves are pooled. In the first set of regressions, we regress on a wave dummy only, while in the second set we control for age and age squared as well as dummies for gender, education, household size, region and municipality size. Household weights are reweighted in order to ensure the same sum of weights for both waves, while keeping the within-wave relative size of weights.

## Annex 2

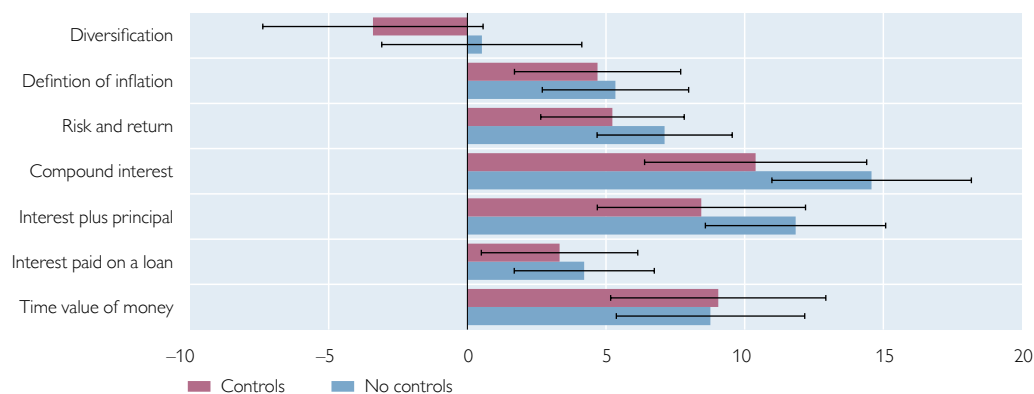
### Summary question presented in box 2

The first financial knowledge question shown in box 2 (“time value of money”) contains information taken from an introductory knowledge question which is not among the set of questions used to calculate the OECD’s financial knowledge score. In the 2019 questionnaire, this question is worded as follows:

Chart A1

### Probability of answering a question correctly

Change in percentage points between 2019 and 2014



Source: ASFL 2014 and 2019, OeNB.

Note: Controls include age and age squared as well as dummies for gender, education, household size, region and municipality size.

1. “Imagine that five brothers are given a gift of EUR 1,000 in total. If the brothers have to share the money equally how much does each one get?”

The questionnaire then moves on to the question on the time value of money:

2. “Now imagine that the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays at around 2%. In one year’s time will they be able to buy: (a) more with their share of the money than they could today, (b) the same amount, (c) less than they could buy today?”

### **Changes made between 2014 and 2019**

For the 2019 wave, the wording of the seven OECD knowledge questions was changed with respect to two questions:

#### *Question on the “time value of money”:*

2014: “Now imagine that the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays (constant) at 2%. In one year’s time will they be able to buy: (a) more with their share of the money than they could today, (b) the same amount, (c) less than they could buy today?”

2019: “Now imagine that the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays at around 2%. In one year’s time will they be able to buy: (a) more with their share of the money than they could today, (b) the same amount, (c) less than they could buy today?”

#### *Question on “risk and return”:*

“I would like to know whether you think the following statements are true or false: An investment with a high return is likely to be high risk.” This question remained unchanged in English and essentially unchanged in German between the two waves, but we made the wording somewhat more accessible in the German questionnaire for the 2019 wave.

Of course, questions that have been reworded complicate comparisons over time as a rule. However, as is evident from the observations made in annex 1, the broad-based improvement of the OECD’s financial knowledge score is not attributable to these minor wording changes.