Households' risk perceptions, overplacement, and financial literacy

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Abstract

Household financial resilience is related to the availability of financial resources but also to the ability to anticipate and assess future situations and prepare for them accordingly. Overplacement describes the tendency of individuals to rate themselves better than others, i.e. they believe that their own chances of experiencing a negative (positive) event are lower (higher) than those of others. In a randomized survey experiment we asses households' perceptions of specific risks, which could affect the future financial situation of their own household (treatment) or of a household with similar characteristics (control). On average, households assign lower probabilities to shocks that negatively affect personal finances if asked for their own household compared to a similar household – confirming overplacement bias in the context of financial risks. We do not find the reverse effect for positive shocks. The treatment effect is stronger among households with lower financial literacy, indicating that financial literacy is relevant for the ability to assess future financial shocks.

JEL classification: D14, D91, G53

Keywords: expectations, beliefs, financial behavior, overconfidence, financial resilience

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0   Non-Technical Summary

Our study utilizes data from the 2019 Austrian Survey of Financial Literacy (ASFL) and a survey experiment to examine how households perceive future financial risks, such as unemployment, health problems, or income changes. The randomized experiment asks households to evaluate the likelihood of these risks affecting their own financial situation (treatment group) versus a similar household (control group). This allows us to explore the concept of overplacement bias, where individuals rate negative events as less likely to happen to themselves compared to others with similar characteristics.

We find that overplacement bias is present in households' assessments of financial risks. On average, households perceive negative financial events – such as unemployment or income loss – as less likely to occur for their own household than for a comparable one. This bias is particularly prominent among households with lower financial literacy. Conversely, households with higher financial literacy tend to show less bias, assessing risks more equally for both their own and similar households.

Importantly, past financial experiences significantly influence how households perceive future risks. Households that have experienced financial shocks in the past tend to adjust their risk perception accordingly. This correlation suggests that the evaluation of future risks contains valuable information, rooted in personal experience, about households' preparedness for financial shocks.

The presence of overplacement bias poses risks. Households that underestimate their own financial risks may fail to adequately prepare for potential economic downturns, leaving them more vulnerable during times of crisis.

Given these findings, our study advocates for targeted interventions to enhance financial literacy, especially among populations with lower financial literacy. Educational programs should focus not only on general financial knowledge but also on specific aspects like risk awareness, financial planning, and the importance of buffer stock savings. These initiatives would be most effective if tailored to the economic and cultural landscape of a country. Collaboration between financial institutions, educational bodies, and government agencies could help extend the reach of these programs to a broad audience.

Future research should focus on the long-term effects of such financial education interventions, particularly on how they influence households' risk assessment behaviors and overall financial resilience in the face of economic uncertainty.

By improving financial literacy and reducing overplacement bias, households can be better equipped to anticipate and prepare for financial shocks, ultimately enhancing their resilience and overall financial stability.

1 Introduction

The pandemic-induced economic crisis strikingly showed how important it is for households to adapt to changing economic circumstances and to weather financial shocks. The ability to withstand economic shocks is crucial to the financial well-being of households. At the individual level, it is related to the availability of financial resources but also to the ability to anticipate and assess future situations and prepare for them accordingly. [3] Recent contributions examining households' financial resilience focus on their ability to come up with a specific amount of money in case of an emergency (e.g. Lusardi et al. 2011, Wiersma et al. 2020, Cziriak 2022, Lusardi and Streeter 2023, Hasler et al. 2023). These contributions show a relationship between financial literacy and households' financial resilience, with more financially literate households better able to face unexpected expenses. Next to the ability to come up with the resources in case of an adverse event, individuals also need to form expectations about the relevance of potential adverse events. Households with higher financial literacy may be more adept at anticipating and preparing for potential future shocks, enabling them to better prepare for such events. This raises the question of the relationship between households' ability to assess potential future financial risks and their financial literacy.

The objective of this paper is to investigate how households form expectations about potential future events which might affect their financial situation and how this relates to their financial literacy. For this purpose, we ran a randomized survey experiment among a representative sample of Austrian households. Both treatment and control groups, are asked to assess the likelihood of being subject to specific future events that might affect a household's financial situation negatively or positively, such as, e.g. unemployment, income losses, or income increases. In the treatment group, these questions are framed for the own household. In the control group, the questions are framed for a household with very similar characteristics compared to the own household. The literature documents the tendency of individuals to rate themselves better than others, i.e. they believe that their own chances of experiencing a negative (positive) financial shock are lower (higher) than those of other households. Following the notion by Moore and Healy (2008), we will label this form of overconfidence as overplacement. If individuals exhibit overplacement when evaluating the risks of future financial shocks, they will perceive that the likelihood of a negative (positive) shock happening to them in the future is lower (higher) compared to a household with similar characteristics. Furthermore, we conjecture that this effect is more pronounced for individuals with lower financial literacy compared to those with higher financial literacy. This may be the case if those with higher financial literacy are better at evaluating future financial risks and thus, all else given, less subject to bias.

We find that households in the treatment group (evaluating their own household) assess the likelihood of being affected by a potential future negative shock as lower compared to the control group assessing a similar household. This indicates the existence of an overplacement bias, as our randomized experiment eliminates selection bias and allows us to establish conditional independence. We can quantify the overplacement bias on average as well as characterize its heterogeneity across financial literacy and several socioeconomic dimensions. When we interact the treatment effect with financial literacy, we find that this pattern is

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[3] For a seminal contribution of household expectations, see Manski (2004).

stronger among households with lower levels of financial literacy. We find no differences in the evaluation of positive financial shocks between the treatment and control group.

To emphasize the relevance of this finding, in a second step, we measure Austrian households' financial resilience by examining their ability to face unexpected expenses. In line with the literature, we find a positive correlation between financial resilience and financial literacy (e.g. Wiersma et al. 2020, Clark et al. 2021, Lusardi and Streeter 2023, Hasler et al. 2023, and Cziriak 2022). As overplacement has been linked to adverse effects, such as increased rates of borrowing (Grohman et al., 2024), overplacement might lead to inadequate preparation for future shocks, which can be particularly detrimental if these shocks are negative. An indication in this direction is provided by Börsch-Supan et al. (2023) who document that individuals who express saving regret later in life are likely to report having experienced adverse shocks to their finances earlier in life.

The analyses are based on data from a representative sample of about 1,400 Austrian households. The survey was run before the onset of the COVID-19 crisis and stems from the 2019 wave of OeNB data collection on financial literacy, known as the Austrian Survey of Financial Literacy (ASFL) (Fessler et al. 2020). Next to an extensive set of questions on financial literacy and financial behavior, we added a survey experiment on risk perceptions to the questionnaire which allows us to examine overplacement bias in this context.

We contribute to the growing literature measuring subjective expectations. Most studies looking at the perception of future risks elicit expectations about macroeconomic variables such as inflation, interest rates, or economic development (e.g. Malmendier and Nagel 2011 and 2016, Das et al. 2020, Andre et al. 2022, Weber et al. 2022). Related to that, several studies examine price expectations for the stock market, houses, and the labor market (see Breunig et al. 2021, Horn 2023, Kuchler and Zafar 2019). These studies document that individuals extrapolate from personal experiences. Only few studies consider expectations about major personal life events, such as unemployment, income risk, or mortality (see Hurd 2009, Heimer et al. 2019). Hudomiet et al. (2018) find strong heterogeneity in formulating subjective expectations and document correlations with probability numeracy. Bucciol and Zarri (2015) show that negative life events influence future risk taking. Malmendier and Shen (2018) document that personal experiences of high local and national unemployment, as well as own unemployment change individuals' beliefs about future economic conditions and have consequences for consumption. Our research extends this literature by using a randomized survey experiment to investigate overplacement in individual assessments of specific financial risks. Moreover, we investigate the role of financial literacy for these risk perceptions.

Additionally, we contribute to the literature on overconfidence. Moore and Healey (2008) provide an overview of the phenomenon of overconfidence and distinguish three forms: (i) overestimation – which they describe as individuals' tendency to overestimate their ability, performance, and level of control, (ii) overprecision – describing the phenomenon that individuals tend to be too sure about their own estimates, and (iii) overplacement – which they describe as individuals' tendency to place themselves as better than others. We are specifically interested in overplacement with respect to expectations/beliefs about events that affect individuals' personal finances in the future. Throughout the literature overplacement has also been described as relative overconfidence (e.g. Burks et al. 2013) and better-than-average effect (e.g. Brown 2012). Weinstein (1980) uses the term over-optimism for a similar phenomenon. The literature on overplacement has focused on the impacts and causes of overplacement bias in the realm of entrepreneurship (e.g. Blaseg and

Schwienbacher 2024) and management (e.g. Enslin 2022). While there exist some contributions to exploring overplacement in the context of households from an economic or financial perspective, a holistic understanding of the role of overplacement for households is still lacking. The main focus of the studies in this field is on overplacement regarding future income among German households (Friehe and Pannenberg 2021, Grohmann et al. 2024). Overplacement could be harmful to the personal financial situation if households misjudge the occurrence of events that might harm their financial situation. For example, Grohmann et al. (2024) show that households who overplace themselves take out more loans. Moreover, Börsch-Supan et al. (2023) document that the experience of unexpected shocks which affected the finances of households negatively, is an important explanation for households' expression of saving regret during retirement, i.e. they express regret over not having saved more earlier in life. We extend the knowledge on overplacement bias among households in the context of financial risks and identify important target areas for future research.

Moreover, our results help to improve our understanding of households' financial resilience. Lusardi et al. (2011) document the financial resilience of households from a series of industrial economies after the financial crisis in 2007-08. Follow-up studies examine households in the US (Hasler et al. 2018, Clark et al. 2021, Hasler et al. 2023), the Netherlands (Wiersma et al. 2020), and Germany (Cziriak 2022). Demertzis et al. (2020) measure financial fragility of households from a European perspective. Some of these papers document a positive relationship between financial resilience and financial literacy (e.g. Lusardi et al. 2011, Wiersma et al 2020, Clark et al. 2021, Cziriak 2022, Lusardi and Streeter 2023, Hasler et al. 2023). So far, the literature on financial resilience has primarily focused on the ability to come up with financial resources in case of a shock. We complement this literature by providing evidence on individuals' abilities to form expectations about potential future risks. Moreover, we document the financial resilience of Austrian households, and how it is related to financial literacy and past financial experiences.

Our results are important in the aftermath of the COVID-induced economic turmoil, the economic consequences of the war in Ukraine, the energy crisis or major weather disasters in recent years. High inflation and high economic uncertainty have put many households in a difficult situation, and many might not be in a position to buffer additional shocks. Assessing financial and economic risks and building means to buffer shocks is important for financial resilience.

The rest of the paper is structured as follows. In the next section, we introduce the data set, and the survey experiment, and describe the variables. In section 3 we discuss our empirical strategy. In section 4 we present the empirical results from the survey experiment. We discuss implications for financial resilience in section 5 and conclude in section 6.

2 Data set and experimental design

This study is based on the Austrian Survey of Financial Literacy (ASFL), which is Austria's contribution to the OECD/INFE survey on adult financial literacy. In a collaborative global effort, the OECD/INFE initiative seeks to enhance understanding of financial literacy across different countries and cultures. It provides a comprehensive framework for assessing financial literacy, promoting consistent and rigorous international comparison. The standard OECD survey comprises questions on financial knowledge, attitudes, and behavior, which the OECD uses to calculate the respective financial literacy scores, along with several control

variables and demographic information (see OECD 2018 and Fessler et al. 2020 for further details). For Austria, the survey was extended to cover various aspects related to the expectations about economic shocks, the personal past experience of such shocks, and a series of financial resilience indicators. In the following subsections, we will explain some of the variables in further detail. The wording of selected core questions used in this study is reported in the appendix.

For the ASFL survey, we conducted 1,418 computer-assisted personal interviews (CAPIs) in April and May 2019, about one year before the Corona crisis. Participants are representative of the Austrian population. Summary statistics of the sample are shown in Table 1. [4] [5]

2.1 Survey experiment on risk perceptions

We measure the *expectations about potential future risks* using direct self-assessed questions about economic shocks, which can positively or negatively affect a household's financial situation. All risks are rated on a scale ranging from one – (almost) impossible – to ten – (almost) certain, depending on how likely households estimate that a certain event will materialize and affect the financial situation of the household. The events are for example unemployment, income decreases or increases, changes in the value of important assets, divorce, and health problems.

The interview questions on risks were asked in two different formats (*between subjects design*). Half of the sample was asked about the expectations of specific risks for their own household (**treatment group**), and the second half of the sample was asked about the expectations of the same risks with respect to a household, which is very similar to the own household (**control group**). The questions were split into events that negatively or positively influence the financial situation of the household. The wording of the question is:

There may be situations in life that can positively/negatively affect your financial situation. I will now read some examples to you.

Treatment*: In your opinion, how likely is it that your household experiences the following situations over the next ten years? Please rate the likelihood of such a situation occurring on a scale from one – (almost) impossible to occur – to ten – will (almost) certainly occur.*

Control*: In your opinion, how likely is it that a household, which is similar to yours, experiences the following situations over the next ten years? Please rate the likelihood of such a situation*

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[4] The survey is based on stratified multistage clustered random sampling, using NUTS 3 regions, municipality size as well as districts in Vienna for regional stratification. We allowed for the replacement of unit nonresponse by drawing new addresses. The gross sample consisted of 3,356 households (3,201 after neutral dropouts). Respondents within households were drawn randomly. 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 post stratification weights based on external population statistics on age and gender at the province level.

[5] Measures for the socio-demographic background are either at the level of the individual or at the household level. Personal level controls are: Age (in age categories), gender, education (in categories), relationship status (in categories), employment status (in categories), and migration background. Household level variables are household size (in categories), municipality size (in categories), and income. In the regressions below all variables and all interactions refer to dummies for each category (leaving a reference category outside).

occurring on a scale from one – (almost) impossible to occur – to ten – will (almost) certainly occur.

The specific negative events are: (1) unemployment of a household member, (2) unexpectedly low income of a household member, (3) longer periods of illness or need for care of a household or family member, (4) additional expenses for childcare, (5) major expenses (e.g. to repair the car, technical devices or damage of the house/apartment), (6) divorce or dissolution of the partnership, (7) loss in value of an important asset (e.g. house/apartment or equity funds).

The positive events are: (1) positive career development, (2) unexpectedly high income of a household member, (3) inheritance, (4) gain in the value of an important asset (e.g. house/apartment or equity fund), and (5) monetary gains (e.g. lottery) or gifts (see the appendix A.3 for the exact questions).

A between subjects design was chosen to reduce experimenter demand effects and survey fatigue induced by asking a very similar and long set of questions twice over the phone. The placement of the questions was almost at the end of the interview and after individuals had reported financial behaviors and answered questions regarding financial literacy. We define variables reflecting the ratings for the seven negative and five positive events: R_k $with$ $k = 1, \ldots 12$ represents the subjective probability of an event k occurring and affecting the financial situation of the household on a scale from 1 (low probability) to 10 (high probability). This allows us to estimate the average treatment effects of differences in expectations between the treatment and control group and analyze the heterogeneity of patterns by characteristics (see section 3 for further details on the empirical strategy). Note that we do not aim at linking subjective probabilities to actual occurrences of events at the individual level. In other words, it is not the subjective probabilities that are relevant and whether individuals are correctly predicting the occurrence of risks in the future, but rather how the estimation of risks for themselves differs from the estimation of risks for others.

Survey participants were randomly assigned to either the treatment or the control group. Out of 1,418 observations 712 are in the treatment group and 706 in the control group. We report summary statistics by group in Table 1. Randomization tests in Column 4 of Table 1 suggest small differences in the socio-demographics between treatment and control group. We also ran a logit regression to test the randomization across socio-demographic characteristics. We report the results in Table A.3 in the Appendix.

2.2   Further Variables

Experiences of past financial shocks. We asked households about their previous experiences of economic shocks over the last ten years that affected their financial situation. Specifically, we asked whether their household finances were ever affected negatively or positively by any of the following events (exact wording of the question in Appendix A.2): (1) unemployment of a household member, (2) unexpectedly low income of a household member, (3) longer periods of illness or need for care of a household or family member, (4) additional expenses for childcare, (5) major expenses (e.g. to repair the car, technical devices or damage of the house/apartment), (6) divorce or dissolution of partnership, (7) loss in value of an important asset (e.g. house/apartment or equity funds). The positive events are: (8) positive career development, (9) unexpectedly high income of a household member, (10) inheritance, (11) gain in the value of an important asset (e.g. house/apartment or equity fund), and (12)

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monetary gains (e.g. lottery) or gifts. We placed these questions about economic shocks strategically at the end of the survey and designed them carefully to ensure that they did not bias responses to other questions or influence the outcome of the survey experiment.

Figure 1 Panel A shows the frequency in which respondents have experienced these events. The most frequent unexpected event with financial consequences is the experience of major unexpected expenses, reported by about 34.6% of households. The second most important unexpected event is unemployment, experienced by 16.6% of the households. Income loss (12.8%), long-term care expenses (15%), and unexpected childcare expenses (12.6%) are in a similar order of magnitude. The experience of positive financial events, such as a positive career development (9.7%), an inheritance (7.3%), or a gift (7.1%), are reported less frequently on average.

Financial literacy. We use the financial knowledge score developed by the OECD (see OECD 2018 and Fessler et al. 2020 for details). The measure is based on a set of seven financial knowledge questions. The questions cover the understanding of key economic and financial concepts such as interest rates, compound interest, inflation, real interest rates, risk diversification, and the link between risk and return. The exact wording of the questions is reported in Appendix A.1. The financial literacy score counts the number of correctly answered questions and it can take values between zero and seven.

Each of the financial knowledge questions offers the possibility of reporting "do not know". We count the number of "do not know" responses to the financial literacy questions. This has been shown to be an important proxy of how confident individuals feel about their financial knowledge and influences financial behavior (Bucher-Koenen et al. 2021). This indicator also takes values from zero to seven.

On average, respondents answer 5.3 of the financial literacy questions correctly. Figure 2 Panel A shows that 28.6% of respondents can answer all seven knowledge questions correctly. The share of respondents with six of the questions answered correctly is equally high (28.6%). However, the share of respondents that perform poorly in this test is also non-negligible: 14.5% of the respondents answered three or fewer questions correctly. Figure 2 Panel B shows the fraction of respondents with 0 to 7 "do not know" responses. The fraction of respondents that select "do not know" for six or seven questions is low (1.1%). However, more than one-third (33.6%) of the respondents select a "do not know" response in at least one out of seven questions.

The response behavior by socio-demographic variables shows the typical pattern (see Table A.1 and Fessler et al. 2020, for more details): financial literacy is lower among the youngest age group (15-29 years old) compared to all older age groups. Furthermore, financial literacy is lower among women, those with lower education and income, those living alone, and those born outside Austria. These patterns are comparable to results from other studies on financial literacy (see Lusardi and Mitchell 2014 and 2023 for reviews). For the number of "do not know" answers, we show the reverse pattern (see column 3 in Table A.1).

Financial resilience. We measure financial resilience using a set of questions similar to those developed by Lusardi et al. (2011) which capture a households' ability to deal with a mid-sized emergency of USD 2.000 within one month. In their paper, the focus was on measuring the consequences of the 2007-08 financial crisis on households. The same measure has recently

been employed, e.g. by Clark et al. (2021), Cziriak (2022), and Wiersma et al. (2020).[6] Compared to the measure by Lusardi et al. (2011) our measure is slightly more differentiated because we capture households' ability to deal with financial emergencies of different magnitudes between 100 EUR up to 5.000 EUR. Note also that we use a shorter and abstract time frame – by that we aim to reduce bias in participants' assessment of their ability to deal with future shocks.[7]

The exact wording of the questions is as follows:

Would you be able to cover unexpected one-off expenses at short notice (a) a mobile phone bill of EUR 100, (b) a new washing machine for EUR 500, (c) a dentist bill of EUR 1,000, (d) repairing water damage for EUR 2,000, (e) a car repair for EUR 5,000?

Based on this question we define five indicator variables to reflect whether a household confirms that they are able to cover expenses of a given size.

3 Empirical Strategy

Our empirical strategy follows Imbens and Rubin (2015) for estimating treatment effects in randomized experiments.

In a first step, we investigate whether the risk perceptions differ between the treatment group and control group. For each of the twelve different measures, we regress the risk assessment (*R*) on the treatment dummy and a constant. Treatment status is 1 if the question was framed in a way that the probability is related to the household of the respondent (treatment group) and 0 if it is related to a similar household (control group). α is a constant, β is the average treatment effect and ε a mean zero error term.

$$R_i = \alpha + \beta \cdot T_i + \varepsilon_i \tag{1}$$

Under the assumption that treatment status is random, this regression gives us the unbiased average treatment effect. However, even if the treatment status is randomly assigned, sampling error can generate correlations between treatment status and certain characteristics which may at the same time be related to the treatment effects. Moreover, since we would like to estimate the average treatment effects and at the same time allow for effect heterogeneity, we follow Imbens and Rubin (2015) and add (demeaned) controls as well as demeaned interactions with socio-demographic characteristics and financial literacy. We include the covariates in deviations from the sample average, so that the estimated coefficient

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[6] Cziriak (2022) discusses the advantages of this direct measure of financial resilience as opposed to measures based on information from households' balance sheets.

[7] We specify the time frame as "at short notice" instead of "within 30 days". Our aim was to shorten the period in which this negative financial shock could occur, as our intention was to capture the immediate ability of households to cope with financial shocks, reflecting real-world scenarios where emergencies occur unexpectedly and often require prompt responses. Furthermore, we aim to reduce bias in participants' answers due to reducing temporal distance, following the suggestions by temporal construal level theory. Moreover, we are using an unspecific timeframe in which the shock can occur, i.e. "short-notice" instead of a specific one such as "30 days". We decided for this approach to capture the unexpected nature of the shock (see also Angrisani et al. 2012).

on the treatment indicator β can be interpreted as an estimate of the average treatment effect in the population.

$$R_i = \alpha + \beta \cdot T_i + (X_i - \bar{X}) \cdot \varphi + T_i(X_i - \bar{X})\theta + \varepsilon_i \qquad (2)$$

Note that because of demeaning, the coefficient β for the treatment status is still the average treatment effect. The coefficients θ for the interactions show the deviations from the average treatment effect related to socioeconomic groups. Hence, they allow us to evaluate whether the treatment effects differ by socio-demographic groups. We are specifically interested in the interaction between the treatment effect and financial literacy. The φs show for each of the characteristics if the allocation to treatment and control group differs for this characteristic. Ideally, all of these coefficients would be 0.

We run separate linear regressions (eq. 1 and eq. 2) for all twelve events (7 negative and 5 positive events). As a robustness check, we additionally run logit regressions. We define the dependent variables for the logit models such that they take the value 0 if individuals select answer category 1 - "(almost) impossible" of an event occurring and value 1 if they select answer categories 2 to 10 indicating a positive probability of the event occurring. In other words, we estimate the probability that individuals deem it "possible" versus "not possible" that an event will occur.

Our conjecture is that if individuals are subject to overplacement we would expect the coefficient of the average treatment effect to be negative for the seven events associated with negative shocks to household finances, i.e., if individuals assess their own probability of experiencing a negative event (treatment group), they report lower probabilities on average as compared to those assessing the probability of a similar household. In contrast, we would expect positive treatment coefficients for the five positive shocks. Moreover, if risk assessments are related to financial literacy, we expect the treatment effect to be stronger for those with lower financial literacy as compared to those with higher financial literacy. This means that we expect the interaction effect between the treatment indicator and the financial literacy score to be negative for the negative future events and positive for the positive events.

The crucial identifying assumption is that the random assignment was successful. In order to test this, we regress the treatment assignment on observable characteristics. In Table 1 we report results from bivariate balance checks. Additionally, we run regressions with treatment assignment as dependent and observable characteristics as independent variables. If the assignment is random, no observable characteristic should be predictive of treatment assignment. We report the results of a logit regression in Table A.3 in the Appendix. It shows that the random treatment assignment was successful. There is only one marginally significant effect (being married). As we have 23 variables in the model, such a result would be expected randomly and we conclude that random assignment was successful. Note that when we estimate eq. 2, we are controlling for differences in observable characteristics and potential nonrandom assignment on observables is taken care of.

A possible threat to identification is selection after treatment assignment. At this stage we operate under a missing at random (MAR) assumption, meaning that we ignore individuals with missing answers. Note that we do not have any missing values in the control variable set X, but we have missing values in our set of dependent variables R. The reason for this is that we allowed individuals to respond with "do not know", "no answer", or "does not apply" in the questions about financial risks. Under the MAR assumption we can simply exclude them from the regressions. However, this could bias our results if respondents in the treatment

group, responding for their own household, have a different likelihood of answering with "do not know", "no answer" or "does not apply" compared to households in the control group, who report the expectation for a similar household. Table A.4 in the appendix shows the share of respondents who report "do not know", "no answer" or "does not apply". There are no systematic differences between the treatment and control group in the fraction of respondents who reply with "do not know" and "no answer" (see Table A.5 for results of significance tests). However, there are significant differences in the fraction of households who answer with "does not apply" between treatment and control group. We discuss this issue and report additional analyses conditioning on specific sub-groups in the robustness checks.

4   Results

We first provide an overview of individuals' risk perceptions, examining how they correlate with past experiences and socio-demographic characteristics in subsection 4.1. In subsection 4.2, we present our main results based on the experimental treatment, revealing the existence of overplacement bias and quantifying it, with significant findings for negative events. In subsection 4.3, we explore the heterogeneity of these treatment effects, showing that financial literacy plays a key role in moderating risk perceptions, particularly overplacement bias. Finally, subsection 4.4 shows robustness checks that confirm the stability of our findings across different models and sub-samples, further supporting the robustness of the results.

4.1   Risk perceptions and past experiences

In this section, we analyze which risk perceptions individuals hold, and how they relate to past risk experiences and socio-demographic characteristics. The objective is to provide face validity of the risk measures and to show that the assessments of risks by individuals are meaningful from a cross-sectional and experience perspective.

Figure 1 Panel B shows the mean risk assessments of respondents on a scale from 0 to 10 when asked about the likelihood of seven different negative events and five different positive events. The dominating risk factor is unexpected major household expenses with an average score of 5.1. This is followed by the costs related to longer periods of illness or need for care of a household or family member with a score of 4.4. However, when contrasting the perceived likelihood of associated positive and negative events (e.g. asset price gain vs. asset price loss), respondents generally seem to assign higher probabilities to positive than to negative outcomes. The likelihood of a gain in the value of an important asset is considered higher than that of potential asset value losses. Similarly, the likelihood of an unexpectedly positive career development is assessed higher than that of unemployment of a household member, while the risks of unexpectedly low or high income of a household member are assessed about balanced. The distributions of the responses for all twelve risks and over all possible response categories are reported in Appendix Table A.4.

To check the validity of our measures of risk assessment, we compare the risk assessments with past experiences of such shocks. The reasoning is that, on the one hand, somebody with past experience should be more aware of potential future risks. On the other hand, it could also be that past experience might lead to a higher rating of the risk because of an overweighting of own experiences. In both instances, we should see a positive correlation

between past experiences and perceptions about the future. Figure 1 Panel A shows the assessment of having been affected by specific shocks in the past. When comparing panels A and B of Figure 1 we can get an impression of the general patterns. Risks that have been experienced on average more frequently in the past are assigned higher values for the future. As our fieldwork took place in 2019, we are confident that the results are not biased by extraordinary events such as the financial crisis 10 years before or the Covid-19 pandemic one year later. The fieldwork followed a decade marked by the recovery from the 2008 financial crisis, creating a stable environment for assessing risk perceptions and behaviors. During this period house prices and generally asset prices increased by far quicker than the Austrian GDP which might partly explain the higher probabilities respondents attached to positive outcomes.

Table 2 reports the correlations between past shocks and future risk perceptions at the individual level for all shocks. People with past personal unemployment episodes indeed give a higher probability to unemployment risks. Those who experienced unexpected income losses in the past also attribute a higher probability to a future income loss. Past episodes of longer illness or need for care within the family make people more aware of the risk that this may repeat in the future. The same applies to past experience with unexpected expenses for childcare. Finally, major unexpected household expenses, e.g. for repair, increase people's perception about the likelihood of future repair costs. We do not find significantly positive correlations between past divorce experiences and future risks, nor is there a clear link between experience with asset price losses and the perceptions about future losses.

When it comes to positive shocks, we find positive correlations between past experiences and future risk assessments for career developments, income increases, inheritance, increases in assets' value, or monetary gains or gifts.

We also analyze subjective risk perceptions by observable characteristics, such as employment status, age, and household composition.[8] Our results show, for example, that older individuals worry less about unemployment, while those currently unemployed worry more. Younger individuals below the age of 30 worry more about potential future income losses compared to those above 60, and larger households worry more in general compared to smaller households. The assessed likelihood of longer periods of illness or need for care of a household or family member increases with the age of the respondent and for retired as compared to full-time working individuals. Furthermore, the risk of unexpected additional expenses for childcare is the highest among the 30-44 year old respondents; it is higher for married and divorced as compared to single households. It also increases with the household size and with the educational background of the respondent. Overall, these validity checks seem to support the fact, that the measures of risk perception on average contain sensible information.

4.2   Treatment effects

After this general assessment of risk perceptions, we turn to our experiment to analyze whether people perceive risks differently depending on whether they are asked about themselves or a similar household. In Figure 3 we plot the average response to the risk measures by treatment group, i.e. the treatment group answers the risk questions for

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[8] Results available from the authors upon request.

themselves and the control group for a similar household. The differences between treatment and control groups are the identified (average) overplacement biases. Panel A presents the treatment effects for the negative events. For five out of seven negative events – namely unemployment, income risk, childcare expenses, divorce, and loss in asset value – households who are asked to rate their own risk indicate a lower likelihood to face this negative event compared to households that are rating the same event for a household similar to their own. We do not detect this pattern for long term care risk and major expenses. In these cases, the risks are evaluated almost equally. The effects for the five positive events are shown in Panel B. We find similar patterns for all five incidents: The households who rate these risks for themselves rate the chances to experience the respective events on average lower than households who rate the likelihood for a similar household. Interestingly, while the pattern detected for the negative events is in line with the overplacement hypothesis, the patterns for the positive events do not line up with our expectations.

In the next step, we estimate five alternative specifications as explained in section 3, adding controls and interactions consecutively for all twelve events. Random assignment of the treatment and additionally including covariates and controls (see discussion in section 3) means that we can causally interpret the effects. Table 3 reports the results of all regressions. Due to the length of the tables and the fact that we are estimating this for all twelve risk assessments separately, we only report treatment effects as well as the effects of financial literacy and their interaction. All other coefficients are suppressed for better readability.[9]

We find highly significant treatment effects in the case of the negative events of unemployment, income, and divorce, significant at the 1% and 5% significance levels, respectively. This means that individuals asked about their own as compared to a household with similar characteristics rate the risk of being affected by such a shock in the future as lower. Evaluated at the means the effects are rather large and reduce the subjective assessment of the negative event by between 10.0% and 15.6% for unemployment, 10.5% and 11.2% for income, and 14.3% and 14.6% for divorce. We find no significant treatment effects for the other negative events.

Surprisingly, we find no significant treatment effects with regard to positive events, except for income increases where the effect is marginally significant at the 10% level for two out of five specifications. However, contrary to the hypothesis, the treatment reduces the rating of the occurrence of such an event in this instance. Thus, there is no evidence of overplacement for positive future financial shocks.

4.3 Treatment effect heterogeneity

In column 4 of Table 3 we added the financial literacy score and the interaction with the treatment effect. The results show that overall, individuals with higher financial literacy rate the risks of negative events as lower compared to individuals with lower financial literacy controlling for differences in socio-demographic characteristics. This means that individuals with higher financial literacy in general rate themselves and similar households as being less likely to be affected by potential future shocks as compared to households with lower financial

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[9] Full regression results are provided upon request.

literacy. The effects are significant for unemployment, income risk, and major expenses and marginally significant for long-term care and divorce risk.

With regard to the interaction of the treatment effect and the financial literacy score, we find that risk perceptions of individuals with higher financial literacy are less likely to be affected by the treatment. In other words, individuals with higher financial literacy are more likely to give equal ratings to the negative risks for their own and a similar household and consequently are less subject to overplacement bias. This effect is highly significant for income risk and marginally significant for major expenses – two of the most important risks that are reported by households having as affected them in the past. Other than that treatment effects seem to be rather similar across levels of financial knowledge.

With regard to the positive events, we find that households with higher financial literacy on average assign themselves and similar households lower chances of experiencing a positive career development, an income increase, or receiving inheritances or gifts. There is no relationship between financial literacy and an unexpected increase in asset values. Thus, regarding future positive events financially literate households seem to be more pessimistic compared to households with low financial literacy. The interaction terms between financial literacy and the treatment are marginally significant in two instances. Households with higher financial literacy in the treatment group tend to rate income increases and positive career developments as marginally more likely compared to those in the control group.

Note, that all the other previous general results hold. This means, that the treatment effects are very robust when controlling flexibly for financial knowledge, confidence, and socio-demographics.

The analysis also reveals substantial heterogeneity in overplacement bias across socioeconomic groups. For negative risks, the unemployed show a stronger positive treatment effect on long-term care and major expenses, while married, divorced, and unemployed individuals exhibit a more pronounced effect for childcare. Part-time workers display a lower treatment effect for divorce risk, whereas married individuals have – naturally – a higher effect. Regarding positive risks, the unemployed experience a stronger effect for career development, while retirees show a positive effect for inheritance and gifts, contrasting with the more negative effects for older and better-educated individuals.

4.4   Robustness checks

In this section, we present several robustness checks.

Binary logit model. In Table 4 we present results from logit regressions. The structure of the table is identical to the structure of Table 3. While we assumed the dependent variable in the previous section to be linear and estimated linear probability models, we estimate binary logit models as a robustness check. We define the dependent variables for the logit models such that they take the value 0 if individuals select answer category 1 - "(almost) impossible" for an event occurring and value 1 if they assign categories 2 to 10 indicating a positive probability of the event occurring. For each of the R_k events a significant proportion of respondents rated the probability as almost impossible (20-30%, see Appendix Table A.4), making the binary logit model appropriate to estimate the probability that people deem it "possible" versus "not possible" that an event will occur.

In summary, the marginal effects calculated from the logit regressions largely confirm the original findings, with some differences in significance levels and the influence of financial literacy. We find that individuals on average estimate the probabilities to be affected by unemployment, income loss, and divorce significantly lower for themselves as compared to a similar household. The experiment's design, aimed at highlighting overplacement bias, is supported by these findings, illustrating that individuals assess risks differently for themselves compared to similar households and that this effect is on average stronger among those with lower levels of financial literacy.

Sub-sample analyses. Up to now, we operated under a MAR assumption. However, we show in Table A.5 in the appendix that "Does not apply" responses are significantly higher in the treatment (own household) compared to the control group (similar household). The exceptions are risks of incurring high childcare expenses and major expenses where the probabilities to select "Does not apply" are similar between treatment and control units. This could reflect two underlying effects. On the one hand, one interpretation of these results can be that they corroborate the results of the experiment: Individuals perceive potential risks as less relevant for themselves compared to similar households, highlighting the overplacement bias.[10] On the other hand, households reporting for their own household might have more information on themselves compared to households reporting for others, so selecting "does not apply" for the own household could reflect this. Therefore, we report robustness checks for subsamples in Appendix Table A.6. Specifically, in Panel A (unemployment) and Panel F (career development) we only include households in which at least the respondent or the partner are employed and in the labor force; in Panel B (income losses) and G (income increases) we exclude pensioners; in Panel C (unexpected child care expenses) we restrict the analysis to household with kids below age 18; in Panel D (divorce risk) we limit the analyses to married households; in Panel E (loss in asset value) and H (gain in asset value) we only consider households who own risky assets.

The effect for unemployment remains stable, when we exclude pensioners from the analyses. The effect on income risk becomes slightly smaller and insignificant in the robustness check. The same is the case for divorce risk, however here the effect remains marginally significant in the specification including financial literacy. Overall, we find these results reassuring especially considering, that the sample sizes are substantially smaller compared to the full results.

Previous experiences. In Table 2 we documented strong positive correlations between past experiences and risk perceptions. Accordingly, we included the past experiences of economic shocks as additional covariates in the regression to check if the treatment effects remain stable. Results are reported in Table A.7 in the Appendix.

The overall take-away is that the treatment effects are robust to the inclusion of past experiences. We find significantly negative treatment effects for unemployment, income risk, and divorce risk. The effect on income increases is not significant any longer. The effects among those with lower as compared to higher levels of financial literacy are stable.

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[10] The lack of significant differences for "Don't Know" and "No Answer" responses is reassuring, as it suggests that both treated and control groups had similar levels of uncertainty or non-response, thereby supporting the quality of the experimental design.

Confidence in financial literacy. We also ran regressions where we added the number of "do not know" answers and the interaction with the treatment effect as additional variables. We do not find any heterogeneity of the treatment effects by confidence in financial knowledge as measured by the number of "do not know" responses.[11]

5 Discussion and implications for financial resilience

In the first part of the analysis, we focused on analyzing overplacement, where individuals compare their own risk assessments to those of similar households. Based on a randomized experiment we were able to identify the existence of overplacement bias, to quantify it, and to assess its heterogeneity across financial literacy and several socioeconomic dimensions. In the second part, we link this result to financial resilience to emphasize the practical relevance of our finding. Financial resilience, defined as the ability to face unexpected expenses, depends on financial means, i.e. income and accumulated safety buffers. The latter builds on the subjective assessment of the occurrence of specific adverse shocks. Overplacement may be one reason for inadequate preparation for future shocks. Financial literacy plays a key role for both the buildup of safety funds as well as for the phenomenon of overplacement (as shown above). Thus, here we would like to highlight the implications of the results on overplacement for understanding household financial resilience.

Figure 4 shows, that almost all households (96.2%) can deal with an unexpected expense of 100 EUR; 87.2% can come up with an unexpected expense of 500 EUR. 75.4% of the households in the sample can cover unexpected expenses of 1,000 EUR, and 64.7% can cover 2,000 EUR. Only 44% are able to cover expenses of 5,000 EUR. Bivariate analyses with socio-demographic variables[12] show that the ability to cover unexpected expenses is higher among older respondents, among men, those with higher education and income, married couples, and those working fulltime or in retirement. The patterns are similar for coming up with smaller compared to larger amounts, but they are on different levels.

Similar to previous studies, we examine financial resilience in a multivariate framework in order to examine the role of financial literacy and financial shocks in the past, controlling for socio-demographic characteristics. Note that this regression framework does not allow for a causal interpretation of the relationship between resilience and past shocks and financial literacy since unobserved factors (such as job risk) and reverse causality (e.g. previous financial experiences and related resilience might imply learning, which increases financial literacy) might influence the relationships. The results should thus only be understood as conditional associations.

Since our measure of financial resilience consists of five categories, we run five separate regressions of the following form:

$$Y_i = \alpha + \beta_1 past\ shocks + \beta_2 fin\_lit + \gamma X_i + \varepsilon_i \tag{3}$$

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[11] Results are available upon request.

[12] Results are available upon request.

where Y_i are the five indicators for coming up with 100, 500, 1000, 2000 and 5000 EUR, respectively. $past\ shocks$ are two indicators of the experience of any negative or positive events, respectively. This means if any of the positive or negative events has been experienced in the past, the indicator is one; otherwise it is zero. fin_lit is the score of financial literacy. Additionally, we include an indicator of the sum of the "do not know" responses to the financial literacy questions. X_i captures the socio-demographic control variables, namely gender, age, income, employment status and marital status.

Results are shown in Table 5. We find a persistent and strong positive relationship between financial literacy and households' financial resilience. This is in line with previous papers on financial fragility which document its relationship to financial literacy (e.g. Clark et al 2021, Wiersma et al. 2020, Cziriak 2022). The relationship with financial literacy is stronger for the questions that ask for a larger monetary sum to cover, i.e. the normalized indicator of financial literacy increases from 0.016 for the question on 100 EUR to 0.064 for the 2,000 Euro question (but declines slightly for the 5,000 EUR question). We do not find a significant or sizable relationship between the number of "do not know"-responses in the financial literacy questions and household financial resilience.

Moreover, we find a negative relationship between negative financial shocks experienced in the past and financial resilience and a positive relationship with positive past financial shocks. The relationship is particularly strong and significant for the larger sums to cover.[13]

Overall, we find that – in line with the literature – financial literacy and financial resilience are related. Moreover, we find that past negative economic events are negatively correlated with households' resilience and that negative events seem to matter more than positive events. However, it is important to note that these are conditional correlations and not causal effects. On the one hand, it could be that individuals who experienced negative financial shocks in the past are better prepared to face financial challenges because of additional precautionary savings. On the other hand, having experienced negative financial shocks might have reduced available financial resources making it harder to come up with a specific amount.

Despite these limitations, our analyses show that both financial literacy and past shocks are highly correlated with financial resilience. At the same time, we have shown that individuals – and in particular those with lower levels of financial literacy show a systematic overplacement bias, especially with respect to potential unemployment and income losses as well as divorce risk. This points into the direction that the perceptions about potential future risks might be relevant for the ability of households to face adverse economic effects in the future. Future research should further investigate the relationship between households' ability to assess risks and precautionary behavior. What is more, based on long-term panel data it would be crucial to study the link between household's subjective expectations, the actual occurrence of shocks, and households' behavior in times of crises.

6   Conclusions

In this paper, we ran a survey experiment asking households to rate the likelihood of future economic events that impose positive and negative financial risks, such as unemployment,

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[13] We also investigated the role of specific financial shocks (results are reported in Appendix Table A.2).

health problems, income losses, or income increases. Perceptions about the occurrence of future shocks and the experience of shocks in the past are highly correlated, giving us confidence that the evaluation of future risks contains meaningful information. Using a randomized experiment we identify overplacement bias: households rate negative shocks as less likely to occur for themselves compared to a household with similar characteristics. Households with higher financial literacy generally rate events with negative financial consequences as less likely to occur compared to those with lower levels of financial literacy. But financial literacy also mitigates overplacement bias as households with higher financial literacy are more likely to rate the risks the same for themselves and a similar household, i.e. they on average show less overplacement bias compared to households with low financial literacy.

Our results are particularly interesting since in Austria economic stability has been historically strong but recently faced unprecedented challenges and overplacement of households towards future economic risks could have detrimental consequences. Households who overplace themselves compared to others may not adequately prepare for potential economic downturns, leaving them vulnerable in times of crisis. This is especially critical given Austria's unique economic landscape, where small and medium sized enterprises play a significant role, and many households are directly or indirectly connected to these businesses. Most of the literature reports negative effects of overplacement on the success of entrepreneurs (Kraft et al. 2022).

Therefore, programs aimed at enhancing financial literacy in Austria and similar countries should likely incorporate elements like buffer stock savings and the role of macroeconomic risks in personal finances. Such programs could be particularly impactful if tailored to the specific economic and cultural context of Austria, potentially involving collaborations with Austrian financial institutions, educational bodies, and government agencies to reach a broad audience. Enhanced financial support programs, particularly for those previously impacted by economic shocks, could help households manage financial shocks. Moreover, if there is a link between financial literacy and resilience it might be helpful to expand financial education, focusing on risk awareness and management as well as financial planning. Such initiatives might improve households' preparedness for economic uncertainties. Collaborative efforts between all stakeholders of financial education – such as the one initiated by the national financial literacy strategy for Austria (OECD 2021) – could facilitate the implementation of such programs.

For future research, it would be insightful to explore the long-term impacts of such policy interventions on households' financial stability and their risk assessment behaviors.
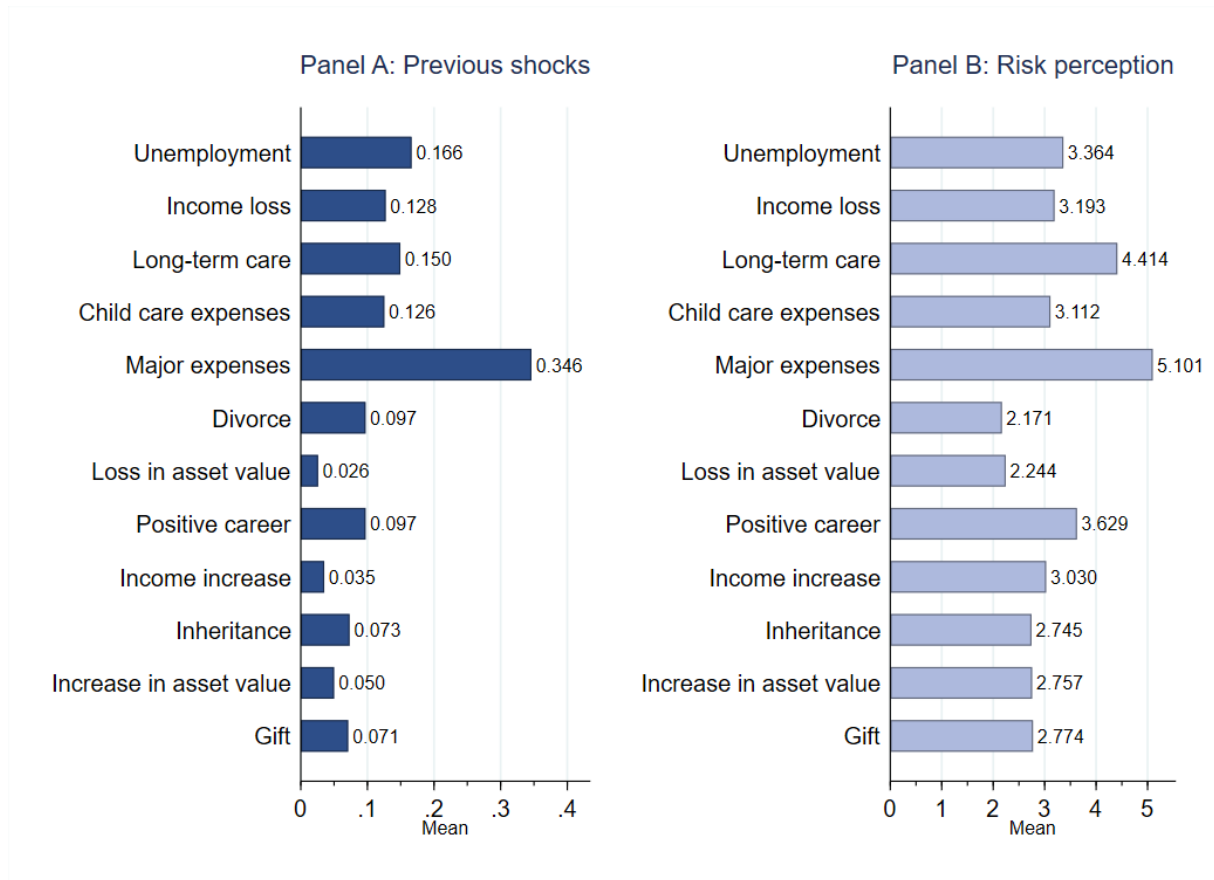
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Figures

Figure 1: Experience of financial shocks and risk perception

Panel A: Previous shocks

Category	Mean
Unemployment	0.166
Income loss	0.128
Long-term care	0.150
Child care expenses	0.126
Major expenses	0.346
Divorce	0.097
Loss in asset value	0.026
Positive career	0.097
Income increase	0.035
Inheritance	0.073
Increase in asset value	0.050
Gift	0.071

Panel B: Risk perception

Category	Mean
Unemployment	3.364
Income loss	3.193
Long-term care	4.414
Child care expenses	3.112
Major expenses	5.101
Divorce	2.171
Loss in asset value	2.244
Positive career	3.629
Income increase	3.030
Inheritance	2.745
Increase in asset value	2.757
Gift	2.774

Notes: Panel A shows the mean for the binary variables of experience of financial shocks, which takes on the values one and zero; one means that the subject has experienced the financial shocks before and zero otherwise. Panel B shows the mean of the subject's risk perception on unexpected events, scaling from one ((almost) impossible to occur) to ten (will (almost) certainly occur).

Figure 2: Financial literacy of households

Panel A: OECD financial knowledge score

Score	Percent
0	0.8
1	2.0
2	4.2
3	6.7
4	11.5
5	17.8
6	28.6
7	28.6

Panel B: Do not know and no answer score

Score	Percent
0	66.4
1	16.9
2	7.3
3	4.2
4	2.4
5	1.8
6	0.7
7	0.4
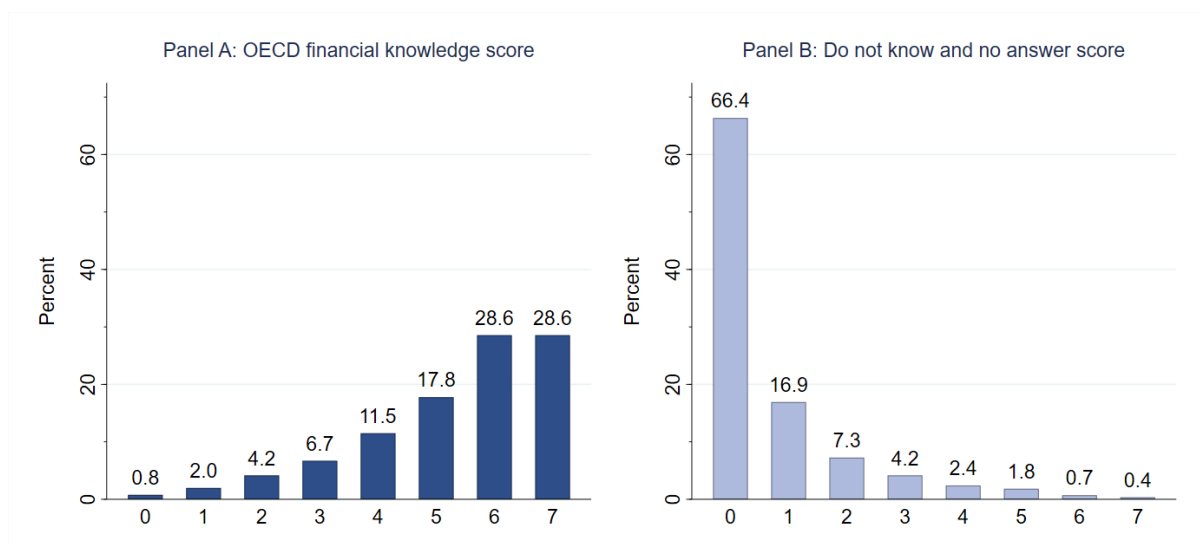
Notes: Panel A shows the percentage of respondents who answered 0 to 7 financial knowledge questions correctly. Panel B shows percentage of the number of don't know and no answer within to the financial literacy knowledge questions.

Figure 3: Risk perception between treatment group and control group
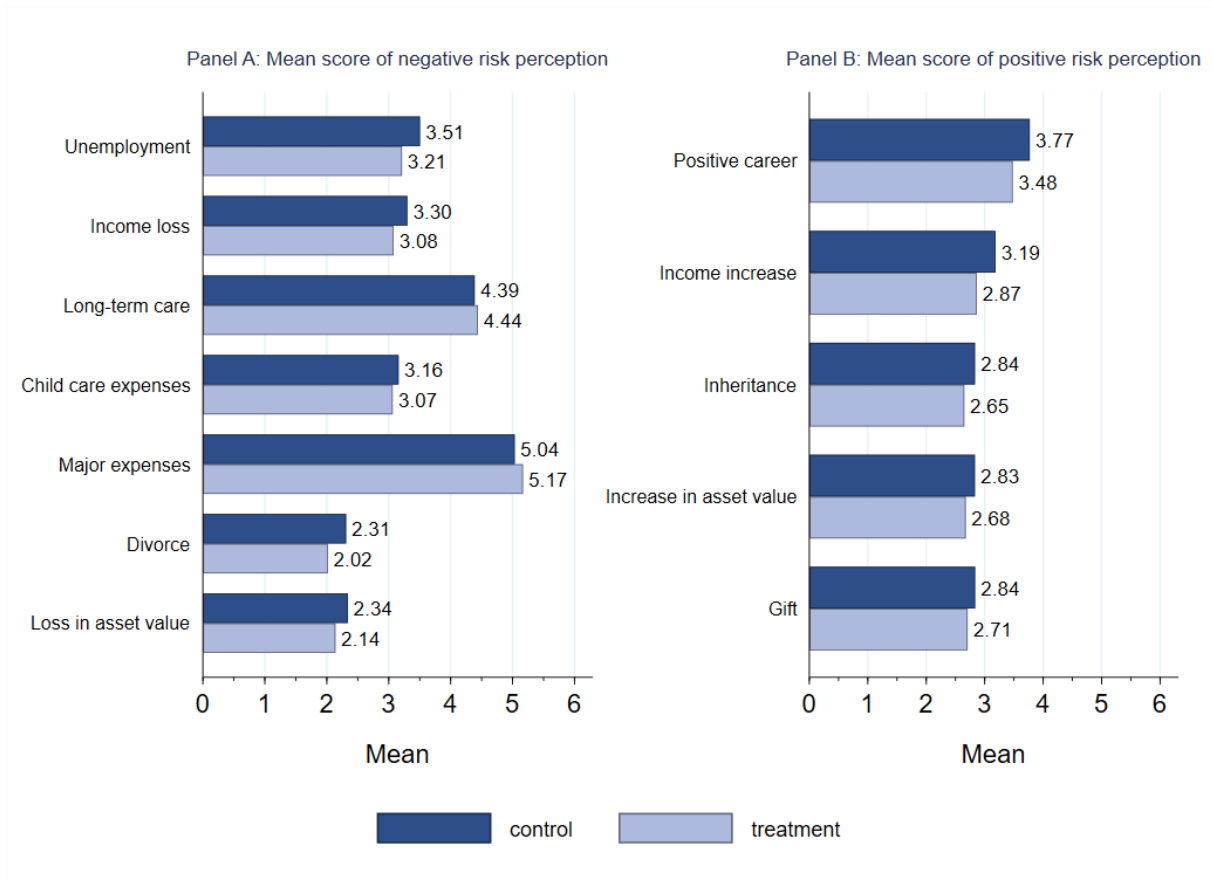
Notes: Panel A shows the mean score of the subject's risk perception on unexpected negative events. Panel B shows the mean score of the subject's risk perception on unexpected positive events. The dark (light) blue color reports the results of the control (treatment) group. All scaled from one ((almost) impossible to occur) to ten (will (almost) certainly occur).

Figure 4: Financial resilience of Austrian households
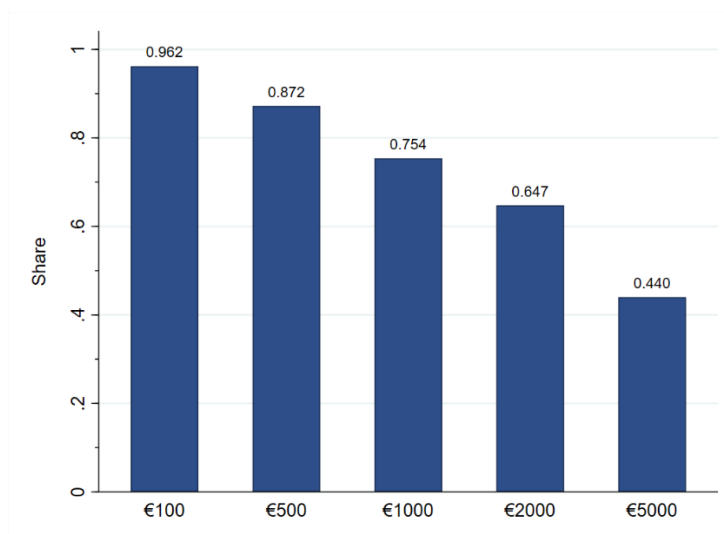
Notes: This figure shows the share of households who can afford unexpected expenses in the size of 100 Euro to 5000 Euro.

Tables

Table 1: Summary statistics

	All	Treated	Control	Difference
Age				
Age 15-29	0.183	0.181	0.186	-0.006
	(0.013)	(0.018)	(0.018)	(0.026)
Age 30-44	0.238	0.236	0.240	-0.004
	(0.012)	(0.018)	(0.018)	(0.025)
Age 45-59	0.281	0.276	0.285	-0.010
	(0.013)	(0.018)	(0.018)	(0.025)
Age 60+	0.298	0.307	0.288	0.020
	(0.012)	(0.018)	(0.017)	(0.025)
Gender: Female	0.518	0.521	0.515	0.007
	(0.014)	(0.021)	(0.020)	(0.029)
Level of education				
Primary education	0.139	0.131	0.146	-0.015
	(0.010)	(0.014)	(0.015)	(0.021)
Lower secondary education	0.394	0.396	0.392	0.004
	(0.014)	(0.020)	(0.020)	(0.028)
Upper secondary education	0.368	0.375	0.361	0.015
	(0.014)	(0.020)	(0.020)	(0.028)
Tertiary education	0.099	0.098	0.101	-0.004
	(0.008)	(0.012)	(0.012)	(0.017)
Marital status				
Single	0.246	0.260	0.233	0.028
	(0.013)	(0.019)	(0.019)	(0.027)
Married/partner	0.55	0.52	0.58	-0.056*
	(0.014)	(0.020)	(0.020)	(0.029)
Divorced/living alone	0.138	0.146	0.130	0.015
	(0.009)	(0.013)	(0.013)	(0.019)
Widowed/no partner	0.067	0.073	0.061	0.013
	(0.007)	(0.010)	(0.009)	(0.013)
Employment status				
Working Fulltime	0.49	0.48	0.51	-0.030
	(0.014)	(0.021)	(0.020)	(0.029)
Working Parttime	0.097	0.104	0.089	0.015
	(0.009)	(0.013)	(0.012)	(0.017)
Unemployed	0.041	0.041	0.042	-0.001
	(0.006)	(0.008)	(0.009)	(0.012)
Retired	0.284	0.306	0.262	0.043*
	(0.012)	(0.018)	(0.016)	(0.024)
Other	0.088	0.074	0.102	-0.028
	(0.009)	(0.012)	(0.014)	(0.019)
Migration background	0.085	0.077	0.094	-0.017
Born outside Austria	(0.008)	(0.010)	(0.012)	(0.016)
Household size				
1 person	0.316	0.329	0.304	0.025
	(0.013)	(0.019)	(0.018)	(0.026)

2 person	0.385	0.384	0.385	-0.001
	(0.014)	(0.020)	(0.020)	(0.028)
3 person	0.142	0.138	0.147	-0.010
	(0.011)	(0.015)	(0.015)	(0.021)
4 person	0.119	0.122	0.116	0.006
	(0.010)	(0.015)	(0.014)	(0.020)
5+ person	0.037	0.027	0.048	-0.021*
	(0.006)	(0.007)	(0.009)	(0.011)
Household income				
Missing	0.176	0.154	0.198	-0.043*
	(0.011)	(0.015)	(0.017)	(0.022)
Income: 0-900 EUR	0.035	0.037	0.034	0.002
	(0.005)	(0.007)	(0.007)	(0.010)
Income: 901-1350 EUR	0.085	0.084	0.086	-0.002
	(0.008)	(0.011)	(0.011)	(0.016)
Income: 1351-1650 EUR	0.067	0.076	0.058	0.018
	(0.007)	(0.011)	(0.009)	(0.014)
Income: 1651-1950 EUR	0.081	0.093	0.069	0.023
	(0.008)	(0.012)	(0.010)	(0.015)
Income: 1951-3000 EUR	0.243	0.260	0.227	0.033
	(0.012)	(0.018)	(0.017)	(0.024)
Income: 3001 EUR +	0.312	0.296	0.328	-0.032
	(0.014)	(0.019)	(0.019)	(0.027)
Municipality size				
0-3000	0.243	0.254	0.233	0.021
	(0.012)	(0.018)	(0.017)	(0.025)
3000-5000	0.142	0.149	0.136	0.013
	(0.010)	(0.015)	(0.014)	(0.020)
5000-1 Mio	0.400	0.400	0.401	-0.001
	(0.014)	(0.020)	(0.020)	(0.028)
1 Mio+	0.214	0.197	0.230	-0.033
	(0.012)	(0.016)	(0.017)	(0.023)
Number of Observations	1,418	712	706	1,418

Notes: Column 2 reports the mean of listed socio-demographic variables for all participants. Column 3 and 4 report the mean of the treated group and the control group, respectively. Column 5 reports coefficients from bi-variate regressions of each variable in the left-most column on the treatment dummy. Robust standard errors are in parentheses. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 2: Correlations between risk perceptions and respective previous shocks

Variables	Previous shocks
(1) Unemployment	0.401***
(2) Income risk	0.337***
(3) Long-term care	0.334***
(4) Child care expenses	0.428***
(5) Major expenses	0.216***
(6) Divorce risk	0.019
(7) Loss in asset value	0.029
(8) Positive career	0.401***
(9) Income increase	0.190***
(10) Inheritance	0.136***
(11) Increase in asset value	0.271***
(12) Gift	0.189***

Notes: * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 3: Regression results survey experiment: risk perceptions and financial literacy

	(1)	(2)	(3)	(4)
Panel A:	Unemployment	Unemployment	Unemployment	Unemployment
Treated	-0.336*	-0.490***	-0.500***	-0.524***
	(0.176)	(0.154)	(0.153)	(0.151)
Financial literacy score				-0.292***
				(0.086)
Financial literacy * treated				0.166
				(0.108)
Obs	1083	1083	1083	1083
Panel B:	Income risk	Income risk	Income risk	Income risk
Treated	-0.271	-0.338**	-0.342**	-0.359**
	(0.169)	(0.152)	(0.151)	(0.151)
Financial literacy score				-0.276***
				(0.089)
Financial literacy * treated				0.278**
				(0.116)
Obs	1153	1153	1153	1153
Panel C:	Long-term care	Long-term care	Long-term care	Long-term care
Treated	0.117	0.056	0.067	0.054
	(0.165)	(0.153)	(0.152)	(0.152)
Financial literacy score				-0.151*
				(0.079)
Financial literacy * treated				0.079
				(0.109)
Obs	1160	1160	1160	1160
Panel D:	Child care expenses	Child care expenses	Child care expenses	Child care expenses
Treated	-0.079	0.003	-0.004	-0.004
	(0.183)	(0.166)	(0.163)	(0.163)
Financial literacy score				0.030
				(0.082)
Financial literacy * treated				-0.086
				(0.108)
Obs	1032	1032	1032	1032
Panel E:	Major expenses	Major expenses	Major expenses	Major expenses
Treated	0.116	0.034	0.029	0.021
	(0.158)	(0.155)	(0.155)	(0.154)
Financial literacy score				-0.174**
				(0.078)
Financial literacy * treated				0.199*
				(0.112)

Obs	1215	1215	1215	1215

Panel F:	Divorce risk	Divorce risk	Divorce risk	Divorce risk
Treated	-0.316**	-0.314**	-0.311**	-0.314**
	(0.135)	(0.138)	(0.138)	(0.137)
Financial literacy score				-0.092
				(0.075)
Financial literacy * treated				-0.099
				(0.099)
Obs	1058	1058	1058	1058

Panel G:	Loss in asset value	Loss in asset value	Loss in asset value	Loss in asset value
Treated	-0.170	-0.145	-0.146	-0.153
	(0.129)	(0.134)	(0.134)	(0.133)
Financial literacy score				-0.041
				(0.073)
Financial literacy * treated				-0.075
				(0.095)
Obs	1099	1099	1099	1099

Panel H:	Career development	Career development	Career development	Career development
Treated	-0.205	-0.260	-0.254	-0.260
	(0.193)	(0.166)	(0.163)	(0.162)
Financial literacy core				-0.158**
				(0.080)
Financial literacy * treated				0.227**
				(0.111)
Obs	1104	1104	1104	1104

Panel I:	Income increase	Income increase	Income increase	Income increase
Treated	-0.250	-0.250*	-0.244	-0.257*
	(0.173)	(0.151)	(0.151)	(0.151)
Financial literacy score				-0.193**
				(0.075)
Financial literacy * treated				0.167*
				(0.099)
Obs	1144	1144	1144	1144

Panel J:	Inheritance	Inheritance	Inheritance	Inheritance
Treated	-0.111	-0.136	-0.136	-0.143
	(0.156)	(0.150)	(0.150)	(0.150)
Financial literacy score				-0.154**
				(0.073)
Financial literacy * treated				0.093
				(0.105)
Obs	1184	1184	1184	1184

Panel K:	Increase in asset value	Increase in asset value	Increase in asset value	Increase in asset value
Treated	-0.128	-0.128	-0.115	-0.116

	(0.164)	(0.153)	(0.152)	(0.152)
Financial literacy score				-0.002
				(0.073)
Financial literacy * treated				-0.056
				(0.110)
Obs	1138	1138	1138	1138
Panel L:	Gift	Gift	Gift	Gift
Treated	-0.026	-0.049	-0.038	-0.063
	(0.150)	(0.149)	(0.146)	(0.146)
Financial literacy score				-0.214***
				(0.077)
Financial literacy * treated				-0.004
				(0.107)
Obs	1175	1175	1175	1175
Household and personal controls		YES	YES	YES
Heterogeneous treatment effects			YES	YES
Financial knowledge index control and interaction				YES

Notes: This table shows treatment effects on the likelihood of different negative and positive shocks as estimated by population weighted regressions. Column (1) shows the treatment effect of our randomized treatment. Column (2) shows treatment effects when employing additional controls for personal and household level characteristics. Column (3) shows average treatment effects additionally allowing for the treatment effect to be heterogeneous across all personal and household level controls, i.e. all interactions included. Column (4) shows the treatment interaction coefficient with the financial literacy knowledge index. All covariates are demeaned to ensure our main coefficient captures the average effect as proposed by Imbens and Rubin (2015). Robust standard errors are in parentheses. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 4: Regression results survey experiment: risk perceptions and financial literacy - marginal effects after logit on a positive probability of the event

	(1)	(2)	(3)	(4)
Panel A:	Unemployment	Unemployment	Unemployment	Unemployment
Treated	-0.076**	-0.134***	-0.010	-0.013
	(0.031)	(0.037)	(0.035)	(0.035)
Financial literacy				-0.026
				(0.017)
Financial literacy interaction				0.013
				(0.024)
Obs	1083	1083	1083	1083
Panel B:	Income risk	Income risk	Income risk	Income risk
Treated	-0.069**	-0.107***	-0.098***	-0.104***
	(0.030)	(0.035)	(0.037)	(0.038)
Financial literacy				-0.039**
				(0.019)
Financial literacy interaction				0.016
				(0.026)
Obs	1153	1153	1153	1153
Panel C:	Long-term care	Long-term care	Long-term care	Long-term care
Treated	-0.028	-0.040	-0.022	-0.022
	(0.026)	(0.025)	(0.026)	(0.026)
Financial literacy				-0.015
				(0.012)
Financial literacy interaction				0.035**
				(0.016)
Obs	1160	1160	1160	1160
Panel D:	Child care expenses	Child care expenses	Child care expenses	Child care expenses
Treated	-0.016	-0.014	-0.009	-0.008
	(0.034)	(0.039)	(0.042)	(0.042)
Financial literacy				0.016
				(0.019)
Financial literacy interaction				-0.023
				(0.027)
Obs	1032	1032	1032	1032
Panel E:	Major expenses	Major expenses	Major expenses	Major expenses
Treated	0.000	-0.003	0.052***	0.052***

	(0.020)	(0.017)	(0.013)	(0.013)
Financial literacy				-0.005
				(0.005)
Financial literacy interaction				0.015**
				(0.007)
Obs	1215	1215	1215	1215

Panel F:	Divorce risk	Divorce risk	Divorce risk	Divorce risk
Treated	-0.061*	-0.068*	-0.086**	-0.087**
	(0.033)	(0.036)	(0.039)	(0.039)
Financial literacy				-0.006
				(0.017)
Financial literacy interaction				-0.018
				(0.025)
Obs	1058	1058	1058	1058

Panel G:	Loss in asset value	Loss in asset value	Loss in asset value	Loss in asset value
Treated	-0.040	-0.016	0.004	0.001
	(0.132)	(0.138)	(0.145)	(0.145)
Financial literacy				-0.008
				(0.071)
Financial literacy interaction				-0.033
				(0.098)
Obs	1099	1099	1099	1099

Panel H:	Career development	Career development	Career development	Career development
Treated	-0.064**	-0.103***	-0.077**	-0.081**
	(0.030)	(0.034)	(0.037)	(0.037)
Financial literacy				-0.030
				(0.018)
Financial literacy interaction				0.032
				(0.025)
Obs	1104	1104	1104	1104

Panel I:	Income increase	Income increase	Income increase	Income increase
Treated	-0.029	-0.037	-0.012	-0.018
	(0.031)	(0.037)	(0.039)	(0.039)
Financial literacy				-0.048***
				(0.019)
Financial literacy interaction				0.012
				(0.026)
Obs	1144	1144	1144	1144

Panel J:	Inheritance	Inheritance	Inheritance	Inheritance

Treated	-0.045	-0.057*	-0.051	-0.052
	(0.032)	(0.034)	(0.035)	(0.035)
Financial literacy				-0.029
				(0.018)
Financial literacy interaction				0.018
				(0.024)
Obs	1184	1184	1184	1184

Panel K:	Increase in asset value	Increase in asset value	Increase in asset value	Increase in asset value
Treated	-0.019	-0.020	-0.017	-0.018
	(0.032)	(0.034)	(0.035)	(0.035)
Financial literacy				-0.004
				(0.019)
Financial literacy interaction				-0.009
				(0.026)
Obs	1138	1138	1138	1138

Panel L:	Gift	Gift	Gift	Gift
Treated	-0.014	-0.017	-0.017	-0.021
	(0.031)	(0.032)	(0.034)	(0.034)
Financial literacy				-0.045**
				(0.018)
Financial literacy interaction				0.013
				(0.024)
Obs	1175	1175	1175	1175
Household and personal controls		YES	YES	YES
Heterogeneous treatment effects			YES	YES
Financial knowledge index control and interaction				YES

Notes: This table shows treatment effects (as marginal effects at the mean after a logit regression) on the likelihood of different negative and positive shocks as estimated by population weighted logit regressions. The binary outcome variable was coded from a scale from one ((almost) impossible to occur) to ten (will (almost) certainly occur) as one being zero and two to ten being 1. Column (1) shows the treatment effect of our randomized treatment. Column (2) shows treatment effects when employing additional controls for personal and household level characteristics. Column (3) shows average treatment effects additionally allowing for the treatment effect to be heterogeneous across all personal and household level controls, i.e. all interactions included. Column (4) shows the treatment interaction coefficient with the financial literacy knowledge index. All covariates are demeaned to ensure our main coefficient captures the average effect as proposed by Imbens and Rubin (2015). Robust standard errors are in parentheses. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 5: Regression results: Financial resilience, financial literacy and past financial shocks

	(1)	(2)	(3)	(4)	(5)
	Can afford unexpected 100	Can afford unexpected 500	Can afford unexpected 1000	Can afford unexpected 2000	Can afford unexpected 5000
Negative shocks	0.003	-0.014	-0.037***	-0.053***	-0.051***
	(0.005)	(0.010)	(0.010)	(0.011)	(0.011)
Positive shocks	0.021**	0.024	0.058***	0.062***	0.082***
	(0.008)	(0.017)	(0.019)	(0.022)	(0.022)
Financial literacy score	0.016**	0.032***	0.055***	0.064***	0.053***
	(0.006)	(0.011)	(0.013)	(0.011)	(0.011)
Financial literacy don't know	0.003	0.003	-0.002	0.002	0.012
	(0.009)	(0.014)	(0.017)	(0.016)	(0.014)
Household and personal controls	YES	YES	YES	YES	YES
Obs	1418	1418	1418	1418	1418

Notes: This table shows results from linear regressions of financial resilience on previous financial shocks, which are summed into one score for negative shocks (takes value from 0 to 7, as there are 7 negative events) and positive shocks (takes value from 0 to 5, as there are 5 positive events). Columns (1) – (5) report the results for several dependent variables of the ability cover unexpected expenses from 100 EUR to 5000 EUR, respectively. * Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Online Appendix

Appendix A.1 Financial Literacy Questions

Seven questions used for the OECD/INFE financial literacy score, calculated as the total number of correctly answered questions:[14]

1. Imagine that five brothers are given a gift of EUR 1,000 in total and have to share the money equally. Now imagine that the brothers have to wait for one year to get their share of the EUR 1,000 and inflation stays 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, or (c) less than they could buy today? *(correct answer: c)*

2. 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? *(correct answer: 0)*

3. Imagine that you put EUR 100 into a no fee savings account with a guaranteed interest rate of 2% per year. You don't make any further payments into this account and you don't withdraw any money. How much would be in the account at the end of the first year, once the interest payment is made? *(correct answer: 102 EUR)*

4. And how much would be in the account at the end of five years? (a) More than EUR 110, (b) exactly EUR 110, (c) less than EUR 110, (d) It is impossible to tell from the information given. *(correct answer: a)*

5. Are following statements (a) true or (b) false?
    -   An investment with a high return is likely to be high risk. *(correct answer: a)*

    -   High inflation means that the cost of living is increasing rapidly. *(correct answer: a)*

    -   It is usually possible to reduce the risk of investing in the stock market by buying a wide range of stocks and shares. *(correct answer: a)*

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[14] All answer options include "Don't know" and "Refuse to answer".

Appendix A.2 Measures of financial resilience and past financial shocks

If necessary, would you be able to cover the following unexpected one-off expenses at short notice? Yes / No / Don't know / Refused

    (1) A mobile phone bill of EUR 100

    (2) A new washing machine for EUR 500

    (3) A dentist bill of EUR 1,000

    (4) Repairing water damage for EUR 2,000

    (5) A car repair for EUR 5,000

Over the last ten years, the following situations have had a negative/positive effect on my own or my household's financial situation. (multiple responses)

    (1) Unemployment of a household member

    (2) Unexpectedly positive career development

    (3) Unexpectedly low income of a household member

    (4) Unexpectedly high income of a household member

    (5) Longer periods of illness or need for care of a household or family member

    (6) Unexpected additional expenses for childcare

    (7) Inheritance

    (8) Unexpected major expenses (e.g. to repair the car, technical devices or damage of the house/apartment)

    (9) Divorce or dissolution of partnership

    (10) Loss in value of an important asset (e.g. house/apartment or equity funds)

    (11) Gain in value of an important asset (e.g. house/apartment or equity funds)

    (12) Monetary gains (e.g. lottery) or gifts

Appendix A.3 Experiment (randomization, sample split):

There may be situations in life that can negatively affect your financial situation. I will now read some examples to you.

Version A: In your opinion, how likely is it that a **household, which is similar to yours**, experiences the following situations over the next ten years? Please rate the likelihood of such a situation occurring on a scale from one ((almost) impossible to occur) to ten (will (almost) certainly occur).

Version B: In your opinion, how likely is it that **your household** experiences the following situations over the next ten years? Please rate the likelihood of such a situation occurring on a scale from one ((almost) impossible to occur) to ten (will (almost) certainly occur).

(1)   Unemployment of a household member

(2)   Unexpectedly low income of a household member

(3)   Longer periods of illness or need for care of a household or family member

(4)   Unexpected additional expenses for childcare

(5)   Unexpected major expenses (e.g. to repair the car, technical devices or damage of the house/apartment)

(6)   Divorce or dissolution of partnership

(7)   Loss in value of an important asset (e.g. house/apartment or equity funds

There may be situations in life that can positively affect your financial situation. I will now read some examples to you.

Version A: In your opinion, how likely is it that a **household, which is similar to yours**, experiences the following situations over the next ten years? Please rate the likelihood of such a situation occurring on a scale from one ((almost) impossible to occur) to ten (will (almost) certainly occur).

Version B: In your opinion, how likely is it that **your household** experiences the following situations over the next ten years? Please rate the likelihood of such a situation occurring on a scale from one ((almost) impossible to occur) to ten (will (almost) certainly occur).

(1)   Unexpectedly positive career development

(2)   Unexpectedly high income of a household member

(3)   Inheritance

(4)   Gain in value of an important asset (e.g. house/apartment or equity fund)

(5)   Monetary gains (e.g. lottery) or gifts

Appendix A.4 Financial literacy and socio-demographic characteristics

Table A.1: Financial literacy and socio-demographic characteristics

	Share (%)	Mean knowledge score (0 to 7)	Do not know score (0 to 7)
Age: 15-29	18.35	4.99	0.74
Age: 30-44	23.83	5.38	0.45
Age: 45-59	28.06	5.43	0.53
Age: 60+	29.76	5.36	0.67
Male	48.20	5.56	0.40
Female	51.80	5.09	0.77
Primary education	13.87	4.29	1.28
Lower secondary education	39.39	5.29	0.56
Upper secondary education	36.80	5.52	0.47
Tertiary education	9.94	6.13	0.17
Single	24.64	5.16	0.62
Married/partner	54.85	5.49	0.51
Divorced/living alone	13.80	5.24	0.57
Widowed/no partner	6.70	4.68	1.13
Fulltime working	49.03	5.56	0.36
Parttime working	9.67	4.89	0.85
Unemployed	4.13	4.80	0.95
Retired	28.38	5.31	0.70
Born in Austria	91.48	5.33	0.57
Born outside Austria	8.52	5.14	0.74
Income missing	17.61	5.05	0.85
Income: 0-900 EUR	3.53	5.02	1.03
Income: 900-1350 EUR	8.50	4.92	0.84
Income: 1350-1650 EUR	6.72	5.38	0.52
Income: 1650-1950 EUR	8.10	5.05	0.61
Income: 1950-3000 EUR	24.34	5.41	0.55
Income: 3000 EUR +	31.20	5.60	0.36
Overall	100.00	5.32	0.59

Notes: Column 2 reports the share of each subgroup of the socio-demographic variables. Mean knowledge score and don't know score of the financial knowledge are reported in Column 3 and 4, respectively.

Appendix A.5 Financial resilience and experience of specific past financial shocks

Table A.2: Financial resilience and previous experience of economic shocks

	(1)	(2)	(3)	(4)	(5)
	Can afford unexpected 100	Can afford unexpected 500	Can afford unexpected 1000	Can afford unexpected 2000	Can afford unexpected 5000
Unemployment	0.014	-0.097**	-0.173***	-0.170***	-0.094**
	(0.021)	(0.042)	(0.045)	(0.042)	(0.037)
Income risk	-0.023	-0.065*	-0.047	-0.058	-0.083**
	(0.026)	(0.039)	(0.042)	(0.041)	(0.038)
Long-term care	0.020	0.062**	-0.001	-0.090**	-0.097***
	(0.016)	(0.026)	(0.034)	(0.037)	(0.036)
Child care expenses	-0.012	-0.005	-0.020	0.051	0.008
	(0.018)	(0.028)	(0.033)	(0.036)	(0.040)
Major expenses	0.019*	0.036**	0.037	-0.023	-0.020
	(0.011)	(0.018)	(0.022)	(0.025)	(0.026)
Divorce risk	-0.011	-0.018	-0.075*	-0.037	-0.070*
	(0.029)	(0.039)	(0.042)	(0.042)	(0.041)
Loss in asset value	0.010	0.042	0.112*	0.045	0.132*
	(0.030)	(0.048)	(0.060)	(0.055)	(0.068)
Career development	0.041***	-0.014	0.008	0.035	0.083*
	(0.014)	(0.036)	(0.042)	(0.047)	(0.044)
Income increase	0.003	0.064	0.123**	0.160**	0.137*
	(0.023)	(0.059)	(0.062)	(0.068)	(0.077)
Inheritance	0.019	0.051*	0.086**	0.051	0.076
	(0.017)	(0.031)	(0.042)	(0.046)	(0.047)
Increase in asset value	-0.006	0.005	0.074*	0.064	0.018
	(0.014)	(0.033)	(0.039)	(0.055)	(0.063)
Gift	0.024	0.011	0.020	0.028	0.080*
	(0.021)	(0.038)	(0.044)	(0.048)	(0.046)
Financial literacy	0.015**	0.029***	0.050***	0.059***	0.051***
	(0.006)	(0.011)	(0.012)	(0.011)	(0.011)
Financial literacy don't know	0.002	0.003	-0.003	0.001	0.011
	(0.009)	(0.014)	(0.016)	(0.016)	(0.014)
Household and personal controls	YES	YES	YES	YES	YES
Obs	1418	1418	1418	1418	1418

Notes: This table shows a regressions of financial resilience on negative and positive previous shocks. Column (1) – (5) reports the results of each dependent variable of the ability cover unexpected expenses 100 – 5000 Euro, respectively.

* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Appendix A.6 Randomization tests

Table A.3: Logit regression of treatment assignment

	(1)
Age 30-44	0.009
	(0.17)
Age 45-59	0.027
	(0.51)
Age 60+	-0.055
	(-0.72)
Female	-0.001
	(-0.04)
Lower secondary education	0.025
	(0.52)
Upper secondary education	0.060
	(1.19)
Tertiary education	0.056
	(0.87)
Married/partner	-0.130[*]
	(-2.37)
Divorced/living alone	-0.034
	(-0.63)
Widowed/no partner	0.013
	(0.18)
Working Part time	0.053
	(0.97)
Unemployed	-0.021
	(-0.25)
Retired	0.113
	(1.70)
Other	-0.061
	(-0.91)
income missing	-0.043
	(-0.94)
income 0-900 EUR	0.085
	(0.89)
income 900-1350 EUR	0.030
	(0.41)
income 1350-1650 EUR	0.107
	(1.49)
income 1650-1950 EUR	0.118
	(1.83)
income 1950-3000 EUR	0.073
	(1.73)
income 3000+ EUR	0.000
	(.)
Born outside Austria	-0.020
	(-0.38)
2 person household	0.106
	(1.78)
3 person household	0.103
	(1.51)
4 person household	0.151
	(1.95)
5+ person household	-0.008
	(-0.08)
Municipality size: 3000-5000	-0.002
	(-0.04)
Municipality size: 5000-1 Mio	-0.040
	(-1.06)
Municipality size: 1 Mio+	-0.079
	(-1.73)
Number of observations	1418

Notes: The table shows the results of a logit regression of treatment assignment on observable characteristics.
* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Table A.4: Answers to perceptions of financial risks

	1	2	3	4	5	6	7	8	9	10	No answer	Does not apply	Don't know
Unemployment (control)	26.6	8.9	9.4	7.0	11.9	4.2	3.7	4.3	1.8	3.6	1.1	11.0	6.6
Unemployment (treatment)	31.2	8.2	8.2	6.1	9.1	3.5	2.3	4.2	1.9	2.8	0.6	16.8	5.0
Income risk (control)	28.6	10.7	11.9	5.5	11.3	4.4	3.9	3.0	2.1	3.5	0.9	8.0	6.4
Income risk (treatment)	33.4	9.7	10.1	5.9	7.7	4.4	3.2	3.2	1.9	2.8	0.7	12.6	4.4
Long-term care (control)	15.8	10.9	11.8	6.0	17.5	7.0	5.1	4.0	4.4	2.5	1.8	2.1	11.3
Long-term care (treatment)	17.5	7.9	10.3	5.6	15.5	7.0	5.6	5.7	3.5	3.3	1.2	6.1	10.8
Child care expenses (control)	34.0	6.0	5.5	5.2	6.9	3.7	4.6	4.1	2.2	1.5	1.3	20.5	4.6
Child care expenses (treatment)	36.5	8.6	5.2	3.6	5.1	3.9	4.5	4.9	1.5	2.5	1.4	19.3	2.9
Major expenses (control)	9.2	6.2	9.1	9.4	20.1	7.8	9.1	10.1	4.2	3.1	1.3	3.2	7.3
Major expenses (treatment)	8.8	6.9	7.8	9.2	16.5	6.7	10.2	11.0	3.8	4.1	1.8	4.9	8.4
Divorce risk (control)	41.7	10.8	10.6	4.0	4.9	2.0	2.0	0.9	0.5	1.7	2.2	14.2	4.4
Divorce risk (treatment)	43.3	11.3	9.0	2.6	3.0	1.1	0.5	1.0	0.8	1.1	2.1	18.7	5.6
Loss in asset value (control)	42.3	13.3	9.3	4.1	4.9	1.4	1.6	0.6	0.9	1.9	1.6	11.8	6.3
Loss in asset value (treatment)	41.1	13.1	10.4	4.4	2.4	1.8	0.9	1.2	0.6	0.7	1.9	15.9	5.5
Career development (control)	24.4	7.9	9.0	5.6	11.4	6.4	6.7	5.2	2.5	3.6	1.3	9.7	6.4
Career development (treatment)	28.5	8.0	7.7	3.2	10.4	5.0	3.4	6.5	2.5	4.2	0.8	14.2	5.5
Income increase (control)	33.5	9.5	7.9	7.1	9.6	4.5	5.0	3.5	1.9	2.8	1.4	7.1	6.2
Income increase (treatment)	33.9	10.9	7.6	4.8	8.7	4.0	3.4	3.5	2.1	1.5	1.5	12.1	6.0
Inheritance (control)	39.3	11.1	11.8	4.7	6.0	3.9	2.2	3.7	1.3	2.3	1.7	5.3	6.8
Inheritance (treatment)	41.9	9.5	7.4	6.3	7.5	3.0	2.4	2.1	1.3	2.2	1.2	9.5	5.7
Increase in asset value (control)	39.6	8.9	8.5	6.1	5.5	4.7	2.7	4.0	1.3	1.5	1.5	9.3	6.5
Increase in asset value (treatment)	39.9	10.1	8.1	3.5	6.6	3.5	2.6	2.7	1.5	1.7	0.9	13.3	5.5
Gift (control)	34.7	15.6	10.4	4.5	8.7	3.7	1.9	3.4	1.3	1.7	1.4	4.1	8.6
Gift (treatment)	34.8	12.0	12.9	4.9	6.6	3.8	2.7	3.0	0.8	1.6	0.9	7.2	8.7

Notes: This table presents the answers to the twelve questions on future financial risks. Separately for the treatment (own household) and the control group (similar household).

Table A.5: Statistical significance of differences in missing responses to perceptions of financial risks by treatment status

	No Answer	Does Not Apply	Don't Know
Unemployment	No	YES	No
Income risk	No	YES	No
Long-term care	No	YES	No
Child care expenses	No	No	No
Major expenses	No	No	No
Divorce risk	No	YES	No
Loss in asset value	No	YES	No
Career development	No	YES	No
Income increase	No	YES	No
Inheritance	No	YES	No
Increase in asset value	No	YES	No
Gift	No	YES	No

Notes: This table presents the results of logistic regression tests evaluating the significance of differences in missing responses to questions about perceptions of financial risks between treated and control groups. The table includes three specific categories: "No Answer," "Does Not Apply," and "Don't Know." For each category, a logistic regression was performed with the category as the dependent variable and treatment status as the independent variable, weighted by the population weights. The significance of the treatment effect was tested, and a "YES" indicates that the difference in responses between the treated and control groups is statistically significant at the 5% level, while a "NO" indicates no significant difference. The tests were conducted for each of the 12 financial risk questions.

Table A.6: Robustness: Perceptions of financial risks of subsamples

	(1)	(2)	(3)	(4)
Panel A:	Unemployment	Unemployment	Unemployment	Unemployment
Treated	-0.252	-0.380**	-0.393**	-0.436**
	(0.195)	(0.179)	(0.176)	(0.174)
Financial literacy score				-0.352***
				(0.094)
Financial literacy * treated				0.190
				(0.119)
Obs	753	753	753	753
Panel B:	Income risk	Income risk	Income risk	Income risk
Treated	-0.053	-0.199	-0.197	-0.228
	(0.200)	(0.182)	(0.181)	(0.179)
Financial literacy score				-0.385***
				(0.100)
Financial literacy * treated				0.362***
				(0.132)
Obs	800	800	800	800
Panel C:	Child care expenses	Child care expenses	Child care expenses	Child care expenses
Treated	0.744*	0.723*	0.733**	0.755**
	(0.390)	(0.378)	(0.368)	(0.369)
Financial literacy score				-0.242
				(0.166)
Financial literacy * treated				0.394
				(0.260)
Obs	237	237	237	237
Panel D:	Divorce risk	Divorce risk	Divorce risk	Divorce risk
Treated	-0.128	-0.227	-0.230	-0.241*
	(0.159)	(0.148)	(0.144)	(0.143)
Financial literacy score				-0.290***
				(0.096)
Financial literacy * treated				0.175
				(0.122)
Obs	667	667	667	667
Panel E:	Loss in asset value	Loss in asset value	Loss in asset value	Loss in asset value
Treated	-0.116	-0.116	-0.149	-0.182
	(0.233)	(0.245)	(0.231)	(0.243)

Financial literacy score				-0.179
				(0.216)
Financial literacy * treated				0.203
				(0.251)
Obs	268	268	268	268

Panel F:	Career development	Career development	Career development	Career development
Treated	0.072	-0.104	-0.083	-0.108
	(0.227)	(0.207)	(0.201)	(0.199)
Financial literacy score				-0.239***
				(0.092)
Financial literacy * treated				0.288**
				(0.135)
Obs	719	719	719	719

Panel G:	Income increase	Income increase	Income increase	Income increase
Treated	-0.070	-0.132	-0.122	-0.148
	(0.208)	(0.189)	(0.189)	(0.189)
Financial literacy score				-0.246**
				(0.098)
Financial literacy * treated				0.211*
				(0.128)
Obs	760	760	760	760

Panel H:	Increase in asset value	Increase in asset value	Increase in asset value	Increase in asset value
Treated	-0.041	0.208	0.132	0.153
	(0.369)	(0.378)	(0.371)	(0.375)
Financial literacy score				0.141
				(0.257)
Financial literacy * treated				-0.207
				(0.335)
Obs	249	249	249	249
Household and personal controls		YES	YES	YES
Heterogeneous treatment effects			YES	YES
Financial literacy and interaction				YES

Notes: This table shows treatment effects on the likelihood of different negative and positive shocks as estimated by population weighted regressions in subsamples. Panel A and F: only employed/in labor force; partner in 2 persons household employed / in labor force; Panel B and G: exclude pensioners; Panel C: household with kids below 18; Panel D: married; Panel

E and H: household has risky assets. Column (1) shows the pure treatment effect of our randomized treatment. Column (2) shows treatment effects when employing additional controls for personal and household level characteristics. Column (3) shows average treatment effects additionally allowing for the treatment effect to be heterogeneous across all personal and household level controls, i.e. all interactions included. Column (4) shows the treatment interaction coefficient with the financial literacy knowledge index. All covariates are demeaned to ensure our main coefficient captures the average effect as proposed in Imbens and Rubin (2015). Robust standard errors are in parentheses.

* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table A.7: Robustness: Perceptions of financial risks controlling for previous experiences

	(1)	(2)	(3)
Panel A	Unemployment	Unemployment	Unemployment
Treated	-0.348**	-0.506***	-0.478***
	(0.164)	(0.149)	(0.149)
Previous shock	2.541***	1.401***	1.414***
	(0.250)	(0.239)	(0.240)
Financial literacy		-0.254***	-0.332***
		(0.082)	(0.096)
Obs	1083	1083	1083
Panel B	Income risk	Income risk	Income risk
Treated	-0.254	-0.336**	-0.317**
	(0.158)	(0.146)	(0.145)
Previous shock	2.496***	1.764***	1.741***
	(0.267)	(0.247)	(0.247)
Financial literacy		-0.272***	-0.361***
		(0.081)	(0.095)
Obs	1153	1153	1153
Panel C	Long-term care	Long-term care	Long-term care
Treated	0.091	0.050	0.047
	(0.156)	(0.147)	(0.148)
Previous shock	2.407***	1.812***	1.813***
	(0.223)	(0.223)	(0.223)
Financial literacy		-0.129	-0.107
		(0.080)	(0.100)
Obs	1160	1160	1160
Panel D	Child care expenses	Child care expenses	Child care expenses
Treated	-0.036	0.009	0.021
	(0.167)	(0.155)	(0.155)
Previous shock	3.112***	2.282***	2.278***
	(0.251)	(0.247)	(0.247)
Financial literacy		0.008	0.068
		(0.076)	(0.095)
Obs	1032	1032	1032
Panel E	Major expenses	Major expenses	Major expenses
Treated	0.112	0.023	0.036
	(0.154)	(0.151)	(0.152)
Previous shock	1.120***	1.035***	1.045***
	(0.159)	(0.153)	(0.154)
Financial literacy		-0.209***	-0.249***

	(0.077)	(0.091)
Obs	1215	1215	1215
Panel F	Divorce risk	Divorce risk	Divorce risk
Treated	-0.314**	-0.312**	-0.311**
	(0.135)	(0.138)	(0.136)
Previous shock	0.200	0.085	0.061
	(0.257)	(0.276)	(0.276)
Financial literacy		-0.092	-0.159*
		(0.075)	(0.094)
Obs	1058	1058	1058
Panel G	Loss in asset value	Loss in asset value	Loss in asset value
Treated	-0.173	-0.158	-0.146
	(0.129)	(0.133)	(0.133)
Previous shock	0.360	0.505	0.497
	(0.356)	(0.390)	(0.397)
Financial literacy		-0.041	-0.072
		(0.073)	(0.089)
Obs	1099	1099	1099
Panel H	Career development	Career development	Career development
Treated	-0.157	-0.236	-0.195
	(0.188)	(0.160)	(0.160)
Previous shock	2.014***	1.053***	1.065***
	(0.312)	(0.280)	(0.277)
Financial literacy		-0.173**	-0.268***
		(0.079)	(0.088)
Obs	1104	1104	1104
Panel I	Income increase	Income increase	Income increase
Treated	-0.210	-0.235	-0.182
	(0.167)	(0.147)	(0.146)
Previous shock	2.739***	1.945***	1.886***
	(0.507)	(0.483)	(0.477)
Financial literacy		-0.203***	-0.370***
		(0.073)	(0.092)
Obs	1144	1144	1144
Panel J	Inheritance	Inheritance	Inheritance
Treated	-0.092	-0.131	-0.117
	(0.153)	(0.147)	(0.146)
Previous shock	1.277***	1.361***	1.360***
	(0.381)	(0.341)	(0.335)
Financial literacy		-0.175**	-0.286***
		(0.073)	(0.095)

Obs	1184	1184	1184

Panel K	Increase in asset value	Increase in asset value	Increase in asset value
Treated	-0.081	-0.086	-0.066
	(0.158)	(0.147)	(0.148)
Previous shock	2.743***	2.477***	2.505***
	(0.336)	(0.341)	(0.339)
Financial literacy		-0.057	-0.077
		(0.071)	(0.085)
Obs	1138	1138	1138

Panel L	Gift	Gift	Gift
Treated	-0.024	-0.061	-0.068
	(0.146)	(0.143)	(0.144)
Previous shock	1.646***	1.538***	1.527***
	(0.264)	(0.257)	(0.259)
Financial literacy		-0.230***	-0.198**
		(0.078)	(0.089)
Obs	1175	1175	1175
Household and personal controls		YES	YES
Heterogeneous treatment effects		YES	YES
Financial knowledge index control and interaction		YES	YES
Financial knowledge don't know / no answer control and interaction			YES

Notes: This table shows treatment effects on the likelihood of different negative and positive shocks as estimated by population weighted regressions, including previous shocks as another independent variable. Column (1) shows the pure treatment effect of our randomized treatment. Column (2) shows treatment effects when employing additional controls for personal and household level characteristics, allowing for the treatment effect to be heterogeneous across all personal and household level controls, i.e. all interactions included, and interaction coefficient with the financial literacy knowledge index. Column (3) adds the missing index defined as the number of don't know and no answer within the financial literacy knowledge index and the interaction with the treatment. All covariates are demeaned to ensure our main coefficient captures the average effect as proposed in Imbens and Rubin (2015). Robust standard errors are in parentheses.

* Significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

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