The Impact of Financial Literacy: Evidence from a Randomized Trial Linked to Administrative Data*

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March 2026

Abstract

We study the effects of adult financial education using a large-scale randomized controlled trial linked to administrative credit register data. The intervention consists of a structured ten-hour personal finance course involving more than 10,000 people in Portugal. Six months after the program, treated individuals exhibit significant improvements in financial knowledge, especially among women, low-income and low-education individuals, and participants with low baseline financial literacy. The intervention also improves self-reported confidence, financial attitudes, and behaviors, including budgeting, saving, retirement planning, informed use of financial products, and financial market participation. Using loan-level administrative data, we find significant changes in debt management: treated individuals reduce reliance on high-cost credit card balances while preserving credit access, experience fewer delinquencies, and are more likely to renegotiate mortgages. Our results suggest that financial education can reduce financial literacy gaps and improve household balance sheet management, even within relatively affluent populations in high-income countries.

Keywords: Household finance, Financial literacy, Randomized trial, Credit register
JEL Codes: D14, G53, I21

*We thank Thorsten Beck, Matteo Benetton, Diana Bonfim, Geraldo Cerqueiro, Emanuele Colonnelli, Kristle Cortés, Tim Kaiser, Nicola Limodio, Annamaria Lusardi, Alexander Michaelides, Lakshmi Naaraayanan, Carly Urban, Neeltje Van Horen, and Stefan Zeisberger; participants at the 2025 Stanford Financial Education Symposium, 18th International Behavioral Finance Conference, G53 Network Brown Bag Lunch, 4th Banco de Portugal Winter Research Workshop, CIRET/Banco de Portugal/KOF Workshop, 2025 FMA Annual Meeting, and OECD/INFE Workshop; and seminar participants at the European University Institute, HEC Paris, and Stockholm School of Economics for helpful comments. We also thank Clara Bento, Carlota Passanha, Gonçalo Luz, Laura Ferreira, Rita Santos, and Susana Gonzalez for outstanding research assistance and the staff of the Banco de Portugal Microdata Research Laboratory (BPLIM) for the continuous support. We are grateful to the CFA Society, particularly Pedro Marques, for collaborating on the development of the materials, and to all program instructors for their dedication. We also acknowledge financial support from Fidelidade. This paper was previously titled "Finance for All: Experimental Evidence of a Financial Literacy Program". The views expressed in this paper solely reflect those of the authors and not those of the Board of Governors of the Federal Reserve System or other members of its staff.

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1 Introduction

Households are central to a well-functioning financial system, making interconnected saving and borrowing decisions that influence asset markets and the allocation of capital throughout the economy (e.g., Gomes et al., 2021). However, financial decision-making is highly heterogeneous, and the set of choices that households face has expanded amid rapid financial innovation and digitalization of financial services. This complexity increases the risk of costly mistakes, making individuals more vulnerable to economic shocks. At the same time, households increasingly bear responsibility for managing their finances, as longer lifespans strain retirement preparedness, and the decline of branch-based banking reduces access to customized advice. In this context, financial literacy—defined as the knowledge and understanding of financial concepts, along with the ability to apply them to make informed and effective financial decisions—has emerged as a global policy priority aimed at enhancing economic well-being and reducing wealth inequalities (e.g., Lusardi and Mitchell, 2023).

Despite increased attention, financial literacy remains low worldwide, including in advanced economies. Klapper and Lusardi (2020) estimate that only one-third of adults globally are financially literate, and OECD (2023) reports that 39% of adults reach the minimum target score. In the European Union, survey evidence similarly indicates that only about half of the population has basic financial knowledge, with lower scores in Southern and Eastern Europe (European Commission, 2023; Demertzis et al., 2024).[1] In addition, while research on the effects of financial education has expanded, much of the available evidence relies on self-reported outcomes and focuses on developing economies or low-income populations (Kaiser et al., 2022). In this paper, we link experimental assignment to administrative loan-level data from the Portuguese Credit Register and show that a structured financial literacy intervention yields substantial improvements in financial knowledge, attitudes, and behaviors, even among relatively affluent individuals in a developed country.

[1]Basic financial knowledge is defined as correctly answering at least three out of five standardized questions on inflation, compound interest, diversification, the risk–return trade-off, and the relationship between bond prices and interest rates.

Specifically, we conduct a nationwide randomized controlled trial (RCT) to evaluate the Finance for All (*Finanças para Todos*) program, a 10-hour structured personal finance course for adults in Portugal, a high-income country with relatively low levels of financial literacy.[2] The course curriculum was developed in collaboration with the CFA Society, offered free of charge through open enrollment, and delivered by qualified instructors either in person or online. The program consists of five classes covering core topics in personal finance, including (i) financial planning and budgeting; (ii) consumer credit; (iii) investment and financial products; (iv) banking, insurance, and digital financial literacy; and (v) retirement and over-indebtedness. Our sample includes 10,815 individuals who are randomly assigned in equal proportions to treatment and control groups. Individuals are highly educated, with 77% holding a higher education degree. 62% report a monthly household net income above €2,000, which is above the national average, and the vast majority have access to financial services. Individuals also exhibit relatively high financial literacy, with 74% classified as financially literate according to Klapper and Lusardi (2020).[3]

We find positive and statistically significant intention-to-treat (ITT) effects on financial knowledge in the follow-up survey administered approximately six months after the intervention. Specifically, individuals assigned to the treatment group correctly answer 0.32 more basic financial knowledge questions (out of five) than those in the control group. This estimate corresponds to a 9% increase relative to the baseline mean, or 0.24 standard deviations (SD), which is larger than the average effect documented in the meta-analysis of 76 RCTs by Kaiser et al. (2022). The share of financially literate individuals increases by 9 percentage points. Knowledge gains are concentrated among participants who attend at least four of the

[2]According to Klapper and Lusardi (2020), only 26% of the Portuguese population is considered financially literate. The OECD (2023) survey reports that only 37% of adults meet the minimum financial literacy standard. Furthermore, European Commission (2023) and Demertzis et al. (2024) find that about 42% of adults have basic financial knowledge, placing Portugal among the lowest-ranked within the EU.

[3]This pattern is consistent with self-selection into the program, with individuals with higher levels of education and financial literacy being disproportionately more likely to enroll, and with financial knowledge being an endogenous choice akin to a human capital investment (Lusardi et al., 2017). However, such knowledge is costly to obtain and depreciates over time. Thus, individuals with higher education levels, and thus higher expected gains, are more likely to invest in financial literacy.

five sessions (over 70% of treated individuals), consistent with a meaningful role for program exposure. Consistent with previous literature, the effects on financial knowledge are larger for women as well as low-education and low-income individuals. The effects are also more pronounced among participants with lower baseline financial knowledge, indicating that average impacts could be larger in populations with lower baseline knowledge. Overall, these results show that while the intervention is broadly effective, its impact is more pronounced among more financially vulnerable groups, suggesting that targeted financial education can serve as a powerful tool for narrowing existing knowledge gaps.

Beyond knowledge, the six-month follow-up survey indicates that the program changes financial attitudes and behaviors, both core components of financial literacy (OECD, 2023).[4] Treated individuals report greater perceived responsibility for their financial decision-making and higher confidence in managing personal finances, financial planning, and setting savings goals. These changes are accompanied by concrete self-reported actions such as developing financial plans, monitoring income and expenditures, and reducing discretionary spending to meet specific objectives. The intervention also affects long-term planning, with treated individuals reporting more diversified retirement strategies, including greater use of private pension plans and asset income. Finally, we also find that treated individuals report experiencing fewer episodes of financial distress than those in the control group using the six-month follow-up survey.[5]

Building on these shifts in attitudes and behaviors, we also examine whether improved financial literacy changes participants' awareness and use of different financial assets (e.g., savings, investments, and retirement products) and liabilities (e.g., mortgages, auto loans, and credit cards). Treated individuals report greater awareness of all asset categories con-

[4]Financial literacy comprises financial knowledge, attitudes, and behavior. OECD (2023) emphasizes that attitudes toward money can influence financial decisions even conditional on knowledge and ability, while financial behavior captures the actions that shape individuals' financial situations.

[5]Reducing financial distress may free up cognitive capacity and improve decision-making. For example, Kaur et al. (2025) and Sergeyev et al. (2025) document that financial stress impairs concentration and performance, while reductions in financial stress are associated with an improved ability to plan, reason, and work effectively.

sidered and are more likely to participate in financial markets by holding bonds, stocks, exchange-traded funds (ETFs), and mutual funds. Interestingly, while the treatment group demonstrates improved knowledge of cryptocurrencies and NFTs, they do not report an increase in holdings. Regarding financial liabilities, survey responses also indicate improved understanding of most consumer credit products. In addition, we find a significant decline in holdings of variable-rate mortgages as well as high-cost consumer credit products such as auto loans.

To capture additional dynamics in household balance sheet management that go beyond self-reported measures, we match our experimental sample with administrative loan-level data from the Portuguese Credit Register. This data set provides detailed monthly information on every loan held by participants, including mortgages, credit cards, auto loans, overdrafts, and personal loans, allowing us to overcome common survey limitations such as recall bias and under-reporting of high-interest debt or delinquencies. The granularity of the Credit Register also allows us to decompose credit into committed amounts (credit limits) and utilized amounts (outstanding balances), helping to distinguish between demand-side responses from supply-side constraints and to identify specific mechanisms of deleveraging.

Using loan-level data, we find that financial education leads to improved household debt management six months after the training. Treated individuals significantly reduce utilization of high-cost unsecured credit, particularly credit card balances, while keeping credit limits unchanged. These results are consistent with a strategic reduction in interest-bearing debt while preserving access to liquidity. We also find improvements in credit performance: treated participants are significantly less likely to experience delinquencies on credit card debt. Finally, we find evidence of more active debt management, with treated individuals more likely to renegotiate mortgage terms with their lenders. Collectively, we provide evidence that financial education causally improves household debt choices and credit performance.

Overall, we show that a structured financial education program can generate measurable economic benefits to households. Beyond gains in financial knowledge and self-reported

financial attitudes and behaviors, we document a significant shift toward greater sophistication in portfolio choices and debt management. Crucially, using administrative data, we identify a mechanism of efficient deleveraging and improved stability, characterized by reduced high-cost revolving debt, fewer delinquencies, and increased mortgage renegotiations. These results suggest that financial literacy interventions can improve household balance sheet decisions even among relatively affluent populations in developed economies.

Prior research links financial literacy to individual financial outcomes and broader financial inclusion (e.g., Lusardi and Mitchell, 2023; Lusardi and Messy, 2023; Lusardi and Kaiser, 2025). A large body of non-experimental evidence documents a strong positive relationship between financial literacy and sound financial behaviors. For instance, Lusardi and Mitchell (2011) find that more financially literate individuals are more likely to plan for retirement and accumulate wealth in the United States, while Van Rooij et al. (2011) show that financial knowledge is positively associated with stock market participation in the Netherlands. Related studies link higher financial literacy to greater portfolio diversification and higher investment returns (e.g., Gaudecker, 2015; Bianchi, 2018), as well as to improved financial product choices, such as more favorable terms on savings accounts (Deuflhard et al., 2019).

Conversely, lower financial literacy is associated with over-indebtedness and financial distress (Lusardi and Tufano, 2015). Limited financial knowledge also correlates with higher borrowing costs (Disney and Gathergood, 2013; Klapper et al., 2013; Lusardi et al., 2020), and low numerical ability predicts mortgage default (Gerardi et al., 2013). Taken together, these non-experimental studies document strong associations between financial literacy and financial outcomes, motivating the hypothesis that improving financial literacy may translate into better financial decisions and credit outcomes.

Experimental evidence provides more direct support for this hypothesis. A meta-analysis of RCTs by Kaiser et al. (2022) finds that financial education programs increase financial knowledge by about 0.15-0.20 SD on average and generate changes in financial behaviors of roughly 0.06-0.10 SD. Estimated effects vary with program intensity, delivery mode, and

participant characteristics. For instance, Kaiser and Menkhoff (2020) show that longer, classroom-based programs produce stronger improvements in both knowledge and behavior than lighter-touch interventions such as brochures or workplace information fairs.

Our research design allows us to make three contributions. First, our paper contributes to the broad financial literacy literature by providing evidence on the effects of a large-scale, experimentally evaluated financial education program for adults, addressing several limitations of prior work. As emphasized by existing reviews (e.g., Hastings et al., 2013; Lusardi and Mitchell, 2014, 2023; Lusardi and Messy, 2023; Zia, 2023; Lusardi and Kaiser, 2025) and quantitative meta-analyses (e.g., Fernandes et al., 2014; Miller et al., 2015; Kaiser and Menkhoff, 2017, 2020; Kaiser et al., 2022), the literature on financial education has expanded rapidly. However, a key gap remains: most existing RCTs rely primarily on self-reported survey data, which is subject to recall and social desirability biases, or focus on developing-country contexts where financial markets differ substantially from those in high-income countries. We help fill this gap by combining an RCT with comprehensive administrative loan-level data from a high-income country.

Few studies combine randomized experimental designs with administrative data. Bruhn et al. (2014) study a financial education course in Mexico City using survey data and limited credit bureau information and find low take-up and modest, short-lived effects. Frisancho (2023) study a financial education program for Peruvian secondary students and find improved financial knowledge and lower arrears among participants who later enter the credit market, despite no broad effects on credit use or overall repayment behavior.[6] In contrast to student samples, our adult participants are actively managing their balance sheets at the time of the intervention, allowing us to observe immediate behavioral responses, including reductions in revolving credit and increased mortgage renegotiation activity.

Second, the granularity of the Credit Register data allows us to shed light on mechanisms underlying debt adjustments. The data distinguish between committed credit limits and

[6]Frisancho (2023) also find sizable spillover effects on parental financial behavior, but only among poorer households and parents of daughters.

utilized balances for revolving credit products, and we find that treated households reduce credit card balances while maintaining their credit limits. This pattern is unlikely to be driven by tightening credit supply and is consistent with a demand-side reduction in interest-bearing debt while preserving access to liquidity.

Finally, we show that financial education affects outcomes even among relatively affluent and educated households. While treatment effects are larger for lower-income participants, we also document meaningful changes among higher-income individuals, who often hold costly revolving debt despite broad access to financial services. These results suggest that financial education extend beyond financial inclusion and can improve household balance sheet management more broadly, providing policy-relevant evidence on the effectiveness of well-designed financial literacy interventions in promoting household financial stability.

2 Program and Methodology

2.1 Background

A recent European Commission initiative provides the first comprehensive survey measuring financial literacy across all EU member states, addressing a long-standing gap in reliable, cross-country data (European Commission, 2023; Demertzis et al., 2024). Conducted through online interviews with 26,139 adults in 2023, the survey assessed knowledge of key financial concepts: inflation, diversification, compound interest, the risk–return trade-off, and the relationship between interest rates and bond prices. Across the EU, only 52% of respondents answer at least three out of five questions correctly (the benchmark to have basic financial knowledge and be considered financially literate), highlighting widespread financial knowledge gaps. Within this context, Portugal emerged as one of the lowest-performing countries in the EU. It ranks second-to-last in overall financial knowledge, with only 42% of individuals classified as financially literate, and scores lowest on questions assessing understanding of compound interest and the inverse relationship between interest rates and bond prices.

Similarly, the Global Financial Literacy Survey, conducted in 2014, finds that only one-third of the global population meet the basic standard for financial literacy (Klapper and Lusardi, 2020). Additionally, it reports that just 26% of adults in Portugal are financially literate based on a standardized set of financial knowledge questions. The more recent OECD (2023) survey on adult financial literacy also reports that only 37% of Portuguese respondents (39% across participating countries) achieve the minimum financial literacy standard of 70 out of 100 points. These results align with long-standing concerns about the persistently low levels of financial literacy in Portugal. In response to these challenges, the Portuguese financial authorities have developed, updated and implemented a national financial education strategy in cooperation with the OECD International Network on Financial Education.[7]

2.2 Program

We design and evaluate the impact of Finance for All (*Finanças para Todos*), a 10-hour program developed by Nova School of Business and Economics (Nova SBE) targeting the adult population in Portugal.[8] The program consists of five weekly sessions, each lasting two hours, and covers key personal finance topics, including financial planning and budgeting, consumer credit, investment and financial products, banking, insurance, digital financial literacy, and retirement and over-indebtedness.

The curriculum was developed by the research team in collaboration with the CFA Society, with the specific aim of reaching individuals with limited financial knowledge.[9] The program has been implemented at Nova SBE and was initially launched in September 2022 as

[7]The National Plan for Financial Education, first launched in 2011 by the Bank of Portugal, the Authority for the Supervision of Insurance and Pension Funds (ASF), and the Securities Market Commission (CMVM), comprises initiatives aimed at improving financial literacy over the medium- and long-term.

[8]The program won the Best Non-Profit Adult Education Project category at the international Money Awareness and Inclusion Awards competition in 2025.

[9]To mitigate concerns that participants might lack the baseline knowledge necessary to fully engage with the material or apply it to their personal circumstances, the program incorporates best practices in financial education, such as the instructional frameworks developed by the Global Financial Literacy Excellence Center (GFLEC). The instruction combines foundational principles with practical rules of thumb, while deliberately avoiding prescriptive or "one-size-fits-all" solutions. The approach is agnostic and comprehensive, tailored to the Portuguese context and participants' socio-demographic characteristics.

a pilot with approximately 700 participants.[10] This pilot did not involve randomization and served to refine the curriculum and test alternative delivery formats. Beginning in September 2023, we introduced random assignment of participants in order to rigorously evaluate the program's causal effects.

The program is open to all adult residents of Portugal aged 18 and over and is offered free of charge. Participants can choose to attend either in person or online. In-person classes are held at Nova SBE in Lisbon (the capital and the largest Portuguese city) as well as at a training center in Porto (the second-largest city). The online format enables broader geographic coverage, allowing individuals across the country to participate while reducing barriers such as commuting time and cost, and offering greater scheduling flexibility. Class sizes typically range from 40 to 60 participants for in-person sessions and from 100 to 120 participants for online sessions. Participants are asked to indicate their preferred attendance mode upon registration. All sessions are scheduled in the evening, outside of standard business hours, to facilitate accessibility for working adults.

The training is delivered by qualified instructors, including CFA charterholders and Nova SBE's experienced teaching assistants. All instructors undergo specialized training to ensure that financial concepts are communicated in a clear, systematic, and practical manner, tailored to an audience with limited financial background. Each session is supported by a dedicated slide deck and concludes with a short quiz designed to reinforce key concepts. While class recordings are made available to participants shortly after the final session, the slide materials are not distributed.

We benchmark our program against the 76 randomized experiments reviewed in Kaiser et al. (2022). Figure IA.1 in the Internet Appendix summarizes the comparison. Among these, 13 studies are classified as comparable based on three criteria: they were conducted in high-income economies, targeted an adult population, and did not specifically focus on

[10]The program's launch coincided with the revision of Portugal's National Plan for Financial Education, which expanded its focus from school-aged youth to the adult population (Conselho Nacional de Supervisores Financeiros, 2022). The program is sponsored by Fidelidade, an insurance company that had no involvement in content development or delivery.

low-income individuals. Our program (represented by the red horizontal line) exceeds any comparable study in terms of sample size and is positioned at the upper end relative to the others. The intervention's duration, ten hours of instruction, exceeds that of any comparable study. It also stands out in terms of the measurement horizon, with planned follow-up surveys at 6, 18, and 36 months post-intervention, as well as administrative data collection extending up to three years. A further distinctive feature of our study is the breadth of outcomes that we can measure, drawing on both survey responses and administrative records. These outcomes are detailed later in this section.

2.3 Recruitment Strategy and Research Design

We implement a randomized controlled trial (RTC) design with treatment assignment randomized within each annual applicant cohort to identify the causal effects of the financial education program. This version of the paper focuses on the pooled sample from Year 1 (September 2023 to May 2024) and Year 2 (September 2024 to May 2025).[11]

Each year, in the months leading up to the start of a new program edition, we promoted the program through a national outreach campaign that included social media, press, and television, intending to democratize access across diverse segments of society and geographic regions. The program received extensive media coverage, including a feature on a prime-time personal finance segment broadcast on a major national television network.

The registration process involved two stages. First, applicants signed up through the program's website and completed a baseline survey capturing socio-demographic characteristics, as well as information on financial knowledge, attitudes, and behaviors. Crucially, they were informed that participation would be determined by random assignment.[12] In the second stage, before the randomization, we contacted all registered individuals by email

[11] Year 3 (September 2025 to May 2026), corresponding to the last cohort of the study, is still ongoing. The pre-analysis plan is registered at the AEA Social Science Registry at `https://www.socialsciencereg istry.org/trials/11650`.

[12] At this stage, participants were also informed about the research study conducted in parallel with the program and were asked to provide informed consent.

to reconfirm their interest and availability. Participants were also asked to indicate their scheduling preferences: attendance format (in-person or online), term (Fall or Spring) and days of the week. Our final sample includes only valid registrants; that is, individuals who completed both stages of the registration process, are at least 18 years old, and reside in Portugal.

Each year, valid applicants were randomly assigned to treatment and control groups with equal probability using stratified randomization. We use five stratification variables: gender, household monthly net income (above or below €2,000), educational attainment (college degree or not), whether the individual has outstanding credit with a financial institution, and preferred attendance format (in-person or online). Within the treatment group, participants were subsequently randomly allocated into classes. We attempted to honor the scheduling preferences to maximize attendance.[13]

The program was delivered in multiple classes that run sequentially each year, resulting in different treatment dates for different classes, i.e., the month a given class concluded the program. For instance, in Year 1 there were classes finishing the program in October, November, and December 2023 (Fall), and in February, March, April, and May 2024 (Spring).

To assess immediate learning outcomes, we administer short quizzes at the end of each class, focusing on the specific content covered during that session. In addition, an exit survey is conducted at the end of the program (i.e., during the final class). This survey reintroduces the financial knowledge questions from the baseline to measure changes in knowledge resulting from participation in the course. It also collects participants' satisfaction levels and qualitative feedback, which are used to inform future improvements to the program.

We conduct the first follow-up survey six months after the training to collect post-treatment outcomes not observable through administrative data, such as savings and investment behavior, or outcomes that are inherently self-reported, including financial knowledge, attitudes, confidence, and behaviors. Due to operational constraints, we conducted the sur-

[13]Whenever demand for certain schedules exceeded capacity, remaining seats were allocated randomly, generating quasi-random variation in course timing at the margin.

vey in two rounds. Treated participants assigned to the program in the Fall received the 6-month follow-up survey in June of the following year, while those assigned in the Spring received it in November of the same year. The control group was surveyed concurrently with the Fall group in June. We offer a financial incentive of €5 for each completed survey to encourage participation.[14]

2.4 Empirical Specification

To estimate the causal impact of the financial education program, we employ an intention-to-treat (ITT) analysis. Following McKenzie (2012), we estimate ANCOVA specifications that control for both baseline covariates and baseline values of the outcome variable. This approach maximizes statistical power while robustly correcting for imbalances at baseline.

2.4.1 Survey-Based Outcomes

For survey-based measures of financial knowledge, attitudes, and behaviors, we estimate treatment effects at the six-month post-intervention follow-up, which is the primary focus of this paper. Let $y_{i,t}$ denote the outcome for individual i at follow-up wave t. We estimate the following ITT specification:

$$y_{i,t} = \beta_0 + \beta_1 \, \mathit{Treatment}_i + \beta_2' X_{i,PRE} + \beta_3 \, y_{i,PRE} + \gamma_{\mathit{Strata} \times \mathit{Cohort}} + \varepsilon_{i,t}, \tag{1}$$

where $\mathit{Treatment}_i$ is an indicator equal to one if individual i was randomly assigned to the treatment group and zero otherwise, $X_{i,PRE}$ is a vector of baseline covariates, $y_{i,PRE}$ is the baseline value of the outcome variable obtained from the pre-treatment survey, and $\gamma_{\mathit{Strata} \times \mathit{Cohort}}$ are strata × cohort (program annual edition) fixed effects. We report robust standard errors. The coefficient β_1 captures the causal effect of being offered the course on outcome y.[15]

[14] Additional follow-up surveys are scheduled at 18 and 36 months post-intervention to assess the persistence and longer-term evolution of the program's impacts over time.

[15] We run alternative specifications where we substitute $\mathit{Treatment}_i$ by the number of classes attended by

2.4.2 Credit Register-Based Outcomes

For outcomes measured in the Credit Register at a monthly frequency, identification requires careful treatment of program timing both within and across cohorts. Owing to capacity constraints, the program was rolled out to treated individuals in different months, generating a setting akin to a randomized phase-in design (Duflo et al., 2007). To avoid potential biases associated with staggered treatment timing (e.g., Roth et al., 2023), we adopt a conservative identification strategy that relies exclusively on comparisons between treated individuals and control individuals (i.e., never-treated individuals at each point in time).

Specifically, our approach ensures that (i) treated individuals enter the regression sample only from the month in which they complete the course onward, so that later-treated individuals are never used as controls, and (ii) the control group consists solely of individuals who remain untreated throughout the entire period of analysis. We estimate an ANCOVA specification analogous to that used for survey outcomes:

$$y_{i,t} = \beta_0 + \beta_1 \, \mathit{Treatment}_i + \beta_2' X_{i,PRE} + \beta_3 \, y_{i,PRE} + \gamma_{\mathit{Strata} \times \mathit{Cohort}} + \delta_t + \varepsilon_{i,t}, \tag{2}$$

where $y_{i,t}$ is the value of the credit outcome in calendar-month t. Unlike the survey specification, this model includes calendar month-year fixed effects (δ_t) to absorb aggregate economic shocks and seasonal effects. The baseline control $y_{i,PRE}$ is defined as the individual's average value of the outcome over the six months preceding the start of the intervention (January through June 2023 for the first cohort). As before, $\gamma_{\mathit{Strata} \times \mathit{Cohort}}$ denotes randomization block fixed effects, and standard errors are clustered at the borrower level.

To study dynamic treatment effects, we replace $\mathit{Treatment}_i$ with a set of event-time indicators indexed to each individual's treatment month, while maintaining the same ANCOVA structure and continuing to rely exclusively on treated-versus-never-treated comparisons.

each participant (Average Treatment Effect on the Treated, ATT).

3 Data

3.1 Survey Data

Our survey data are drawn from self-reported questionnaires administered at registration (baseline), at the end of the final class (exit), which are available only for the treatment group, and six months after the intervention (follow-up).

Following the literature, we classify survey outcomes into three broad categories: financial knowledge, attitudes, and behaviors. To assess knowledge, defined as the understanding of financial concepts and principles required to make informed decisions, we adopt the five standard financial literacy questions from the S&P Global FinLit Survey, as analyzed in Klapper and Lusardi (2020). At the time of our study's design, this instrument represented the most comprehensive global benchmark of financial literacy, providing a widely accepted and validated tool for international comparisons.

We chose this set of questions over alternative measures developed in the literature for several reasons. First, the survey focuses on four core concepts directly relevant to everyday financial decision-making: diversification, inflation, numeracy, and interest compounding. Specifically, the first two questions assess understanding of risk diversification and inflation, both of which are essential for informed investment decisions. The third question evaluates basic financial numeracy, particularly in the context of debt management. The final two questions test comprehension of compound interest through distinct scenarios. Second, these concepts are broadly applicable across institutional and cultural contexts, which we consider critical for ensuring external validity and informing policy beyond our specific setting. Finally, the widespread adoption of these questions (included in the 2014 Gallup World Poll, which surveyed more than 150,000 nationally representative adults across over 140 countries) supports their credibility and comparability in large-scale research (Klapper and Lusardi, 2020).

With respect to attitudes, defined as beliefs, values, and emotional dispositions toward

personal finance, we measure participants' views on money management and future planning. Respondents are asked to indicate their level of agreement, on a Likert scale, with the following statements: "I am satisfied with my current financial situation," "My financial situation does not limit my ability to do things that are important to me," and "I set long-term savings goals and do everything to achieve them." In addition, we assess financial confidence, which is understood as the self-perceived ability to make informed financial decisions and manage money effectively.

Our most comprehensive set of outcomes pertains to financial behaviors; that is, the concrete actions individuals take in managing their financial lives. The self-reported measures encompass indicators of budgeting and financial planning, saving practices, investment and retirement preparedness, and credit usage and management. Additionally, we collect information related to household income, financial decision-making responsibilities, and experiences of financial distress. These measures capture either observable financial actions or the tangible consequences of financial decision-making, and thus fall within our broad conceptualization of financial behavior.

3.2 Administrative Credit Register Data

To provide a more granular analysis of household liabilities, we complement our survey data with administrative records from the Credit Register of the Banco de Portugal from January 2023 to December 2024. This data set provides objective, high-frequency indicators on financial decisions that are often not reported or misreported in surveys due to recall or social desirability biases. Specifically, we obtain detailed monthly data on all loans held by individuals in the experimental sample, including mortgages, overdrafts, credit cards, and auto loans, along with associated terms such as amounts, interest rates, and maturity. For now, this matched data set is available only for the first cohort (September 2023 to May 2024).

By linking these administrative outcomes to our experimental design, we can identify the

precise mechanisms through which financial literacy operates, moving beyond self-assessments to capture the universe of formal credit responsibilities. For instance, this setting enables us to isolate the causal impact of financial education on the intensive margin of credit, tracking exactly how individuals manage existing debt obligations, and to detect objective signals of financial distress, such as delinquent loans (i.e., overdue loans), which are notoriously under-reported.

3.3 Descriptive and Experimental Statistics

Our final sample comprises 10,815 individuals. Table 1 presents the distribution of participants over the years and across treatment and control groups. Figure IA.2 in the Internet Appendix maps the number of participants and share of treatment by province. The geographic distribution closely mirrors that of the broader Portuguese population, underscoring the national reach of the program. The figure also shows that treatment assignment is geographically balanced, particularly in provinces with a higher number of observations.

Panel A of Table 2 shows the sample descriptive statistics. More than two-thirds of the sample are women. The mean age is 39 years, which places our program at the upper end of the age distribution of the financial education studies (see Figure IA.1 in the Internet Appendix). The households of the participants have 2.8 people on average, and 62% have a monthly household net income above €2,000. Our sample is highly educated, with 77% of participants holding a higher education degree. A very small fraction of our sample (4%) is unemployed, 89% have a checking account, and 75% have some sort of credit product with a financial institution.

Our sample is not only highly educated but also exhibits relatively high levels of financial literacy. On average, participants correctly answered 3.6 out of five financial literacy questions prior to the treatment, and 74% meet the threshold of being considered financially literate as defined by Klapper and Lusardi (2020)—that is, correctly identifying at least three out of four key financial concepts. Benchmarking against the cross-country results presented in

Klapper and Lusardi (2020), we find that while Portugal typically ranks near the bottom in terms of financial literacy, the financial literacy levels observed in our sample are comparable to those in the highest-performing countries, including Denmark, Norway, and Sweden (see Figure 1).[16]

These comparisons indicate self-selection into the program, with individuals with higher levels of income, education and financial knowledge being disproportionately more likely to enroll. This pattern is consistent with the view that financial knowledge is an endogenous choice, akin to a human capital investment (Lusardi et al., 2017).[17] However, acquiring such knowledge entails costs and is subject to depreciation over time. Consequently, individuals with higher levels of education, who tend to have greater savings and investment activity, and therefore higher expected returns from improved decision-making, are more likely to invest in financial literacy.[18]

Panel B of Table 2 presents baseline statistics from the Credit Register, which provides objective measures of household liabilities across four key products: mortgages, auto loans, credit cards, and overdrafts. The number of observations reflects that these administrative data are currently available only for the first cohort of participants and vary across categories, since statistics are computed conditional on individuals holding the respective credit product. In terms of loan amounts, mortgages represent the largest liability on household balance sheets, followed by auto loans. Contract terms reflect the long-term nature of mortgages, with an average mortgage maturity of approximately 26 years, compared with roughly five years for auto loans. The Credit Register data also indicate a strong baseline credit profile: only 1% of loans is classified as delinquent.

[16] A similar pattern emerges when comparing our results to those of European Commission (2023) and Demertzis et al. (2024), which report that only about 42% of Portuguese adults have basic financial knowledge, one of the lowest rates in the European Union. In contrast, participants in our sample have a baseline financial literacy level comparable to that of adults in Finland, the best-performing country in Europe.

[17] Cole et al. (2011) also show that the most educated and financially-savvy individuals are more likely to participate in a financial literacy course.

[18] This selection effect may also reflect the recruitment strategy, which relied heavily on mass and social media outreach, channels that tend to attract individuals with higher levels of education and income. To broaden the program's reach and engage populations with lower levels of education and income, alternative recruitment strategies should be explored.

Finally, Panel A of Table 3 shows that the randomization procedure generated balance across a broad set of baseline characteristics. Treatment and control groups do not differ significantly at conventional levels on any dimension, providing support for the internal validity of the experimental design. Panel B confirms that Credit Register outcomes are also largely balanced, with only marginal differences observed in auto loan amounts and delinquency rates for credit cards and overdrafts.

3.4 Experimental, Exit and Follow-Up Survey Statistics

Attendance rates in the program are high, and attrition during the training sessions appears relatively low. Figure 2 shows that attendance is highest in the initial session, exceeding 80%, and gradually declines to around 70% by the fifth session. 22% of participants attended the program in-person. While in-person attendance is marginally higher than online attendance, the differences are modest. Specifically, Panel A of Table IA.1 in the Internet Appendix shows that individuals in the treatment group attend an average of 3.8 classes, with a median of 5 sessions, and 87% attend at least one class.

Panel B of Table IA.1 shows that 63% of the treated participants answered the exit survey at the end of the last class. The number of correct answers to the five financial knowledge questions used in the baseline is 4.3, resulting in a share of financially literate participants of 92%. Treated participants rated the program very satisfactorily (4.5 out of 5).

Table 1 shows that more than half of the participants completed the six-month follow-up survey, with response rates of 61% in the treatment group and 55% in the control group. Despite this difference, the characteristics of respondents remain balanced across groups, as reported in Table IA.2 of the Internet Appendix.

We further investigate the determinants of survey response in Table IA.3 in the Internet Appendix. In addition to treatment status, several participant characteristics are associated with a higher likelihood of responding to the follow-up survey. Response rates are significantly

higher among women, older individuals, those with checking accounts, and those with higher financial knowledge. Engagement during the training sessions strongly predicts follow-up participation, with individuals who attended four or five classes much more likely to respond. In contrast, those who attended up to three sessions are significantly less likely to complete the follow-up survey.

4 Effects on Financial Knowledge

In this section, we analyze the effect of attending the financial literacy program Finance for All (*Finanças para Todos*) on financial knowledge six months after the intervention.

4.1 Univariate Analysis

We begin with a univariate analysis of financial knowledge, measured by the number of correct answers to the five knowledge questions. Among treated participants, the mean score rises from 3.6 in the baseline survey to 4.3 in the exit survey (Panel B of Table IA.1 in the Internet Appendix), which was administered only to the treatment group. In the six-month follow-up survey, completed by both treatment and control groups, the mean score remains elevated at 4.0 (Panel C).

Figure 3 presents the changes in the distribution of the number of correct answers between the baseline and follow-up surveys separately for treatment and control groups. Gains in financial knowledge (represented by green bars) are more frequent among treated individuals. For instance, among participants who answered zero questions correctly at baseline, 41% in the treatment group went on to answer four or five questions correctly in the follow-up, compared to just 15% in the control group. Among participants who answered two questions correctly at baseline, 81% of the treated group improved their performance in the six-month follow-up, compared to 65% in the control group. Knowledge gains are especially pronounced among individuals with the lowest baseline proficiency. In contrast, the decline

in performance (red bars) is less prevalent in the treatment group relative to the control group.

Figure IA.4 in the Internet Appendix shows the evolution of responses to each financial literacy question for the treatment and control groups. First, we observe substantial persistence: a large majority of individuals who answer a question correctly at baseline also do so in the follow-up survey. Second, the share of individuals who initially answer incorrectly and later answer correctly is consistently higher in the treatment group than in the control group. Conversely, the share of individuals who initially answer correctly and later answer incorrectly is consistently lower in the treatment group than in the control group.

Overall, the univariate analysis indicates that the financial literacy training resulted in measurable gains in knowledge, particularly among those with lower initial financial literacy levels. We next turn to a multivariate analysis to formally estimate the effect of the intervention, and to explore heterogeneity in treatment effects across participant characteristics.

4.2 Multivariate Analysis

Table 4 shows a positive and significant intention-to-treat (ITT) effects of financial literacy training on financial knowledge, as measured by the number of correct answers to five financial literacy questions six months after the intervention. On average, individuals in the treatment group answered 0.333 more questions correctly than those in the control group (column (1)). This effect is around 0.32 when controlling for a rich set of covariates, strata $\times$ cohort fixed effects, and baseline financial knowledge (columns (2) and (3)). The magnitude of the effect is economically meaningful, representing approximately 9% of the baseline average or 0.24 standard deviations (SD). Alternatively, the training increases the share of financially literate individuals by 9 percentage points relative to the control group (column (5)).

Further evidence on the effects on each of the five financial literacy questions is provided in Table IA.4 in the Internet Appendix. We find statistically significant treatment effects across all questions. The smallest effect is for numeracy, which has the highest baseline

knowledge, while the largest gain is for risk diversification.

Moving beyond the ITT framework, we also estimate the average treatment effect on the treated (ATT), focusing on session attendance. Column (4) of Table 4 shows that knowledge gains are significantly larger among participants who attended at least four out of the five classes (72% of our sample). Despite the endogenous decision of attendance, these results suggest a positive relationship between training intensity and knowledge acquisition, consistent with the interpretation that financial education enhances participants' understanding of core financial concepts.

We explore heterogeneity in treatment effects across different socio-demographic dimensions. Table 5 reports significantly stronger treatment effects among women (ITT = 0.151), older individuals, lower-income individuals (ITT = 0.106), and those without tertiary education (ITT = 0.108). We also find larger gains among participants with lower baseline financial knowledge: among initially non-financially literate individuals, the intervention increases the number of correct answers in the follow-up survey by 0.314 relative to initially financially literate individuals (defined as correctly identifying at least three of four core financial concepts). Figure 4 illustrates this pattern in greater detail, showing that the treatment effect is strongest among participants with low baseline financial literacy and declines monotonically with the number of correct answers at baseline. Given the relative proficient level of financial literacy among our pool of participants, these findings suggest that the estimated effect on financial knowledge represents a lower bound for the potential impact of financial education programs.

Finally, we examine whether the format of training delivery moderates the effect. We find no statistically significant difference in knowledge gains between the in-person and online formats, suggesting that both delivery modes are similarly effective in enhancing financial literacy.

To better understand the persistence of knowledge gains, we examine whether immediate improvements in financial knowledge, measured at the end of the training program, mediate

the effects observed six months later. Specifically, we compare outcomes on the six-month follow-up survey with performance on the exit survey, conducted during the final training session.[19] Column (1) of Table IA.5 in the Internet Appendix shows that individuals in the treatment group who improve their performance in the exit survey (relative to baseline) correctly answer, on average, 0.697 more questions in the follow-up survey, compared to only 0.186 among those who do not show improvement in the exit survey. In column (2), we disaggregate these results further by grouping participants based on the magnitude of their improvement between baseline and exit surveys: those who improve by three or more correct answers, those who improve by one or two, those with no change, and those whose performance declines. The results reveal a clear and monotonic relationship, with participants who immediately improve by three or more questions answering 1.342 more questions correctly six months later.

These findings provide compelling evidence of strong mediation dynamics. Indeed, they suggest that the improvements observed in the six-month follow-up survey are not driven by unobserved confounding factors such as increased awareness or subsequent enrollment in other programs, but are instead a direct consequence of the financial literacy training itself.

An important consideration in interpreting our results is that outcome data are available only for individuals who completed the six-month follow-up survey, which represents 58% of the full sample. While Section 3.4 shows that observable characteristics are balanced across treatment arms among respondents, concerns remain that the responding subsample may differ along unobservable dimensions. To address potential bias arising from non-random survey response, we implement the bounding approach developed by Lee (2009) to estimate treatment effects under monotonic selection. As reported in Panel A of Table IA.6 of the Internet Appendix, the Lee bounds (both with and without trimming) yield lower bound estimates of 0.21, which are statistically significant at the 1% level. These results help

[19] This analysis is restricted to the subset of participants who completed both the exit and the six-month follow-up surveys. Control group members are coded as having zero improvement, as they did not complete the exit survey.

mitigate concerns that our findings are driven by selective attrition.

Additionally, we estimate the treatment effect using propensity score matching. In this approach, we match respondents in the treatment group with observationally similar respondents in the control group based on baseline covariates. As shown in Panel B of Table IA.6, the resulting estimates are similar to those from the main specification in Table 4, further supporting the robustness of our findings to concerns about non-random survey response.

Overall, the results in this section show that participation in the financial literacy program leads to immediate gains in financial knowledge, which persist for at least six months after the intervention. Moreover, the effects are heterogeneous across participants: we observe stronger knowledge gains among women, lower-income and less-educated individuals, and those with low initial financial knowledge. These findings underscore the role of financial education programs to reduce knowledge gaps among vulnerable populations.

5 Effects on Financial Attitudes and Behaviors

In this section, we turn to the analysis of financial attitudes and behaviors, leveraging a wide range of outcomes collected through a survey conducted six months after the end of the program. This analysis focuses on treatment effects in financial attitudes and confidence, decision-making, actions, and distress.

5.1 Financial Attitudes and Confidence

In the context of financial literacy, attitudes encompass individuals' perceptions, beliefs, and dispositions toward financial behaviors and decision-making. These attitudes are crucial, as they impact confidence, motivation, and the willingness to engage in effective financial planning and management.

Columns (1)-(3) of Table 6 indicate that treated individuals, relative to the control group, report significantly greater satisfaction with their current financial situation, perceive

fewer constraints in performing essential tasks, and exhibit a higher propensity to set long-term savings goals and to take concrete steps toward achieving them. In addition, column (4) shows that treated participants rate their own financial knowledge more favorably, suggesting improvements in financial self-efficacy and self-perceived competence in managing personal finances.

These results suggest that financial literacy training not only enhances objective financial knowledge but also promotes a more positive and empowered mindset toward financial decision-making. The observed improvements in attitudes may be instrumental in fostering sustained changes in financial behaviors, as higher levels of confidence, goal-setting, and perceived control are strongly associated with proactive financial decision-making and greater resilience in the face of financial stress.

5.2 Financial Decision Making and Actions

Column (1) of Panel A in Table 7 reports the estimate of the treatment effect on financial decision-making roles within households. Individuals in the treatment group are significantly more likely to have financial autonomy, suggesting that financial literacy training can empower participants to exercise greater agency in financial decision-making. Column (2) indicates that treated individuals are 6 percentage points more likely to engage in forward-looking financial planning; that is, to create a plan for managing income and expenses. This effect corresponds to an increase of approximately 0.15 SD in budgeting behavior, which is broadly consistent with the average treatment effect reported in Kaiser et al. (2022). However, we do not find significant impacts on other routine financial management behaviors in columns (3) to (5), such as tracking expenditures, separating funds for bills versus daily spending, or automating regular payments. Nonetheless, we show a positive and statistically significant treatment effect at the 1% level when considering a financial decision-making index, i.e., the average of the outcome variables in columns (2)-(5).

Panel B of Table 7 examines the specific actions participants report taking to achieve

their financial goals. The results indicate that individuals in the treatment group are significantly more likely to adopt effective financial behaviors, such as formulating a concrete action plan, saving or investing money, seeking additional sources of income, and reducing discretionary spending. Specifically, column (1) shows that treated individuals are 7.5 percentage points more likely to prepare an action plan, while column (2) indicates a 5.4 percentage point increase in the likelihood of saving or investing. The estimated effect on saving or investment behavior corresponds to an increase of approximately 0.09 SD, in line with the average treatment effect of 0.10 SD reported by Kaiser et al. (2022). In addition, columns (3) and (4) show that treated individuals are 4.4 and 3.3 percentage points more likely, respectively, to pursue additional income opportunities and reduce spending.

In contrast, columns (5) and (6) reveal that treated participants are less likely to adopt credit-based strategies, such as increasing credit card limits, taking on additional loans, or seeking new lines of credit. Overall, the financial behaviors index—constructed as the average of the outcomes in columns (1) through (4), and one minus the outcomes in columns (5) and (6)—shows a positive and statistically significant treatment effect at the 1% level.

Taken together, these findings suggest that financial literacy training promotes a shift toward more proactive and effective financial behaviors. The program appears to foster not only planning and goal setting but also a departure from reactive or debt-dependent strategies. This transformation may contribute to enhanced household financial resilience and long-term financial well-being. These results indicate higher levels of financially savvy behavior among treated individuals relative to the control group, even within a sample characterized by above-average initial financial knowledge.

5.3 Retirement

We next examine the impact of the intervention on retirement-related attitudes and planning behaviors. Column (1) of Table 8 shows that treated individuals report a 0.22-point increase in confidence about their retirement planning on a 1-to-5 Likert scale. This result indicates

that the intervention effectively strengthened participants' self-assurance in managing long-term financial goals.

In terms of actual planning behaviors, column (2) shows that treated individuals are 1.9 percentage points less likely to rely solely on mandatory social security contributions. This may reflect a growing preference for retirement strategies that offer greater autonomy and potentially higher returns. Column (3), however, shows no significant increase in reliance on employer-sponsored pension plans.[20] In contrast, column (4) reveals that treated individuals are 5.1 percentage points more likely to report using private pension plans. This suggests a stronger inclination toward proactive and self-directed retirement planning. Furthermore, column (6) indicates an 5.4 percentage point increase in the likelihood of planning to finance retirement through income from financial or non-financial assets, consistent with a shift toward more diversified, investment-oriented strategies.

Taken together, these findings point to a positive impact of the intervention on both retirement confidence and preparedness. They are consistent with enhanced financial planning ability and a broader transition toward increased financial independence.

5.4 Financial Assets

We now examine the impact of the intervention on individuals' financial asset portfolios. While we do not have data on the amounts invested, we collect information that enables us to assess both participants' awareness of, and actual holdings in, various types of financial instruments. The survey data allow us to examine effects only at the extensive margin.

Panel A of Table 9 shows that treated individuals exhibit significantly greater awareness of checking accounts (column (1)); fixed-term deposits and Treasury certificates (column (2)); bonds (column (3)); stocks, exchange-traded funds (ETFs), investment funds, and financial insurance products (column (4)); crypocurrencies and non-fungible tokens (NFTs) (column (5)); and retirement savings plans or pension funds (column (6)). With the exception of

[20]The pension system in Portugal is predominantly defined-benefit, and employer-sponsored pension plans are relatively uncommon.

checking accounts, which represent the most basic financial product, all coefficients are statistically significant at the 1% level. We also find a positive and statistically significant treatment effect at the 1% level when considering an awareness index, constructed as the average of the outcome variables in columns (1) to (6). This result suggests that the intervention effectively enhanced financial literacy related to the breadth of available financial instruments.

Panel B examines actual financial asset holdings and reveals statistically significant treatment effects not just for savings products but also for several investment-oriented products. Specifically, individuals in the treatment group are 2 percentage points more likely to own a checking account, 1.2 percentage points to hold bonds, and 4.9 percentage points more likely to hold stocks, ETFs, investment funds, or financial insurance. In contrast, we find no statistically significant treatment effects for more traditional or less complex products, such as fixed-term deposits and Treasury certificates. Interestingly, despite improved knowledge about cryptocurrencies and NFTs, we find no increase in holdings of these very risky assets. Overall, we find a positive and statistically significant treatment effect at the 1% level when considering a holdings index, again constructed as the average of the outcome variables in columns (1) to (6).

5.5 Financial Liabilities

Turning to credit products, Table 10 shows that individuals in the treatment group exhibit significantly greater knowledge of various consumer loan types, including mortgages with mixed and fixed rate, personal loans, credit cards, and bank overdrafts. Indeed, the effect on the consumer credit awareness index (columns (4) to (7)) is positive and statistically significant at the 1% level, suggesting that the intervention effectively improved financial literacy on a broad range of available consumer credit products.

Panel B examines whether individuals hold each type of credit and reveals statistically significant treatment effects for specific loan types. Treated participants are approximately

2.2 percentage points less likely to hold mortgages with a variable interest rate. They are also more likely to hold mixed-rate mortgages, a relatively more sophisticated product that was new in the Portuguese market at the time of the intervention and combines a fixed interest rate for an initial period followed by an adjustable rate, although this effect is not statistically significant. This pattern suggests that the intervention may have facilitated the adoption of more complex and potentially advantageous mortgage products, supporting more informed and effective credit decisions.

In addition, treated individuals are significantly less likely to hold auto loans. We also find negative treatment effects on personal loans, credit cards, or overdrafts, but the effects are imprecisely estimated. Taken together, these findings suggest that participants who received treatment are less reliant on higher-cost forms of consumer credit after the intervention, as shown in column (8). Indeed, the results point to a targeted effect of the intervention on credit-related decision-making: it enhances awareness, encouraging the adoption of more sophisticated mortgage products, and reducing the use of more expensive credit instruments.

5.6 Financial Distress

Column (1) of Table 11 shows that individuals in the treatment group are significantly less likely to have experienced financial distress, defined as insufficient income to meet living expenses during the previous 12 months. The estimated reduction of 5 percentage points is both economically meaningful and statistically significant at the 1% level. This result suggests that the financial literacy intervention effectively reduces the likelihood of financial stress, enabling participants to better manage their resources and overcome income shortfalls.

Financial stress can have significant negative economic consequences. Kaur et al. (2025) show that financial concerns intrude into daily life, diminishing focus and workplace productivity. When workers receive a cash infusion, they reduce debt, meet essential needs, and subsequently perform better at work. Similarly, Sergeyev et al. (2025) find that financial stress creates a psychological poverty trap, impairing individuals' ability to reason, plan, and

make optimal decisions. Alleviating financial stress frees up cognitive resources, enabling individuals to concentrate, make better choices, and become more productive both in the short and long run. In addition to its cognitive toll, financial stress also fosters poor financial behaviors, such as impulsive spending and inadequate planning.

Columns (2)-(11) further explore the actions participants report they would adopt in response to financial distress. Treated individuals are significantly more likely to report reducing expenses or work longer as their primary coping mechanism, indicating a prudent and self-reliant approach to managing adverse financial shocks. Importantly, the treatment group is also significantly less likely to rely on existing credit such as an overdraft or a credit card. This finding is particularly salient, as it points to a decreased risk of debt accumulation, a key contributor to long-term financial vulnerability. In addition, treated individuals report fewer instances of late bill payments or defaults, further indicating improvements in financial stability and short-term liquidity management.

Overall, these results highlight the positive impact of financial literacy training on participants' ability to navigate financial challenges. The evidence suggests that the intervention not only reduces the likelihood of financial distress but also promotes healthier coping strategies that support long-term financial resilience and well-being.

5.7 Attention

Table IA.7 in the Internet Appendix presents evidence that the intervention increased participants' attention to financial decision-making. Panel A shows that treated individuals are 5.5 percentage points more likely to carefully read the contracts of financial products at the time of contracting, indicating greater diligence and awareness. Conversely, they are less likely to report that they do not read such contracts.

Panel B indicates that treated individuals monitor their financial portfolios more frequently, with a higher likelihood of reviewing them at least weekly. Specifically, they are 1.9, 3.7 and 4.0 percentage points more likely to check the performance of their financial

investments on a weekly, monthly or annual basis, respectively. In contrast, they are 1.2 percentage points less likely to report never reviewing their portfolio performance. Panel C shows that this effect is also statistically significant within the subsample of individuals who report holding financial investments.

Overall, these findings suggest that the intervention fostered a more proactive, attentive, and informed approach to personal financial management among participants.

6 Evidence from the Credit Register

In this section, we analyze objective credit outcomes using Credit Register data. Unlike survey responses, which may be affected by recall or social desirability bias, these records allow us to observe actual borrowing behavior at a monthly frequency. We focus on the intensive margin to track how the training intervention affects the management of existing debt obligations over the six months after the intervention. This high-frequency setting is particularly well suited to detecting adjustments in high-cost consumer credit, where changes such as voluntary repayment can occur shortly after treatment.

Table 12 reports treatment effects on the log amount of credit across the four main consumer credit product categories (mortgages, auto loans, credit cards, and bank overdrafts) at the intensive margin, i.e., among individuals who hold the respective product. For credit cards and overdrafts, we distinguish between utilized amounts (outstanding balances) and committed amounts (credit limits). Because these are revolving credit instruments, unlike fixed-term installment loans such as mortgages and auto loans, individuals can adjust utilization up to a pre-approved limit.

The results indicate a significant reduction in high-cost consumer credit within six months of the program. In particular, treated individuals exhibit a persistent 12.8% decline in utilized credit card balances relative to the control group, with negative and statistically significant coefficients throughout the post-treatment period (up to six months after the in-

tervention). Importantly, we find no corresponding change in credit limits for credit cards, which is consistent with lower revolving balances while maintaining access to the liquidity a credit card provides. In contrast, we find no statistically significant changes in either utilized or committed amounts for bank overdrafts. Finally, we find no statistically significant differences in outstanding amounts for mortgages or auto loans, suggesting that the program does not mechanically discourage borrowing, or at least not in the short-term, but instead affects the composition and cost of unsecured consumer debt.

We next examine delinquencies, measured by the prevalence of delinquent loans (i.e., overdue loans). Table 13 reports the results where the dependent variable is a dummy that equals one if the loan is delinquent, and zero otherwise. Consistent with the decline in credit card balances, we also observe improved repayment outcomes: the probability of credit card delinquency is 0.7 percentage points lower for the treatment group than for the control group (the mean delinquency rate is 1%),, and the effect remains stable through six months post-intervention. We do not find statistically significant effects on mortgage or overdraft delinquency. For auto loans, point estimates are generally negative across the dynamic specifications, but most effects are not statistically significant. These administrative measures of delinquency complement the survey evidence by showing that the intervention reduces delinquencies and improves credit performance, particularly for high-interest unsecured debt.

Finally, Table 14 indicates that treated participants become more active in managing long-term liabilities. Columns (1) and (2) show estimates of a regression where the dependent variable is a dummy that equals one if a mortgage has been renegotiated within six months after the intervention, and zero otherwise. We find a 1.1 percentage point increase in the probability of mortgage renegotiation within the same bank among treated individuals (the mean renegotiation rate is 1%), with positive and statistically significant effects immediately after the intervention.[21] Columns (3) and (4) also show a statistically significant reduction in the number of mortgage products held, consistent with mortgage consolidation. We also

[21] We focus on mortgage renegotiations because other consumer credit products typically lack standardized renegotiation processes or flexible clauses for ex-post adjustments.

find a small short-run decline in the number of auto loan products in columns (5) and (6). In contrast, we do not detect effects on the number of credit cards or overdrafts within six months of treatment.[22]

In sum, combining administrative data with the large-scale RCT provides robust evidence that financial education affects household balance sheet management. Treated individuals reduce exposure to high-cost unsecured debt while preserving credit access, experience fewer credit card delinquencies, and are more likely to renegotiate long-term liabilities such as mortgages. These adjustments indicate that the intervention causally improves household debt choices and credit performance, consistent with enhanced short-run financial resilience through improved debt management.

7 Conclusion

In this paper, we evaluate the impact of a structured financial literacy program targeting adults in Portugal. The intervention consists of ten hours of personal finance training delivered either in person or online, covering topics ranging from budgeting and saving to investment principles and debt management.

We show significant improvements in financial knowledge six months after the intervention: treated participants outperform control participants on financial knowledge assessments. Effects are larger among women, lower-income individuals, participants without tertiary education, and those with low baseline financial knowledge, highlighting the importance of targeting programs toward groups with lower initial literacy.

Beyond knowledge, the program improves participants' attitudes and confidence in managing their personal finances, including retirement planning. We also find short-run behavioral changes. Treated individuals report greater financial autonomy and are more likely to

[22]We also examine loan maturities for mortgages and auto loans in Table IA.8 but find no statistically significant effects. Similarly, Table IA.9 shows no significant differences for personal loans six months after the program, regardless of whether we consider amounts, maturities, delinquencies, or the number of credit products.

engage in practices such as budgeting, monitoring income and expenditures, reducing discretionary spending, and planning for retirement. They also report higher saving and financial market participation and lower reliance on credit-based coping strategies.

The intervention also affects reported portfolio choices and product awareness. Treated individuals report greater familiarity with a wider range of financial products and higher participation in financial markets, including holdings of stocks, ETFs, and bonds. They also report improved knowledge of cryptocurrencies and NFTs, without a corresponding increase in holdings. On the credit side, treated participants report improved understanding of credit products and less reliance on high-cost consumer credit, and they report fewer episodes of financial distress.

Finally, linking experimental assignment to administrative loan-level data provides objective evidence that financial education affects household debt management. Treated individuals reduce utilization of high-cost unsecured credit card debt, without changes in credit limits, consistent with lower revolving balances while preserving access to liquidity. We also find improvements in credit performance, with fewer credit card delinquencies, and more active management of long-term liabilities, reflected in higher rates of mortgage renegotiation.

Taken together, the results indicate that a structured financial literacy program can generate meaningful improvements in knowledge, attitudes, and financial behavior, and that these gains are reflected in both survey and administrative measures of borrowing and repayment outcomes.

In future work, we will link the experimental sample to additional administrative records, including checking, savings, and investment accounts data; tax filings; transaction-level consumption data; employer–employee matched labor market data; property ownership registries; and bankruptcy records. In addition, we will examine whether improvements in financial knowledge translate into long-run differences in income and consumption, asset accumulation, and employment and entrepreneurship outcomes.

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Table 1: Sample Counts

Panel A: Cohort 2023/2024

		Answered Survey		
	Sample	Exit	6-Month Follow-Up	
	Obs.	Obs.	Obs.	%
Treatment	2,620	1,622	1,479	56
Control	2,614	-	1,340	51
Total	5,234	1,622	2,819	54

Panel B: Cohort 2024/2025

		Answered Survey		
	Sample	Exit	6-Month Follow-Up	
	Obs.	Obs.	Obs.	%
Treatment	2,795	1,769	1,822	65
Control	2,786	-	1,603	58
Total	5,581	1,769	3,425	61

Panel C: Pooled Cohorts

		Answered Survey		
	Sample	Exit	6-Month Follow-Up	
	Obs.	Obs.	Obs.	%
Treatment	5,415	3,391	3,301	61
Control	5,400	-	2,943	55
Total	10,815	3,391	6,244	58

This table presents the number of participants randomly allocated to treatment and control groups, the number of treated units that answered the exit survey conducted at the end of the last class, and the number of participants that answered the 6-month follow-up survey.

Table 2: Descriptive Statistics

	Mean	SD	Median	Observations
Panel A: Baseline Survey				
Female	0.69	0.46	1	10,815
Age	39.05	10.92	38	10,815
Household size	2.77	1.30	3	10,815
Household income < €2000	0.38	0.49	0	10,815
Higher education	0.77	0.42	1	10,815
Economics-related education	0.21	0.41	0	10,815
Attended fin. literacy before	0.13	0.34	0	10,815
Unemployed	0.04	0.19	0	10,815
Has a checking account	0.89	0.31	1	10,815
Has some form of credit	0.75	0.43	1	10,815
Renting a home	0.20	0.40	0	10,815
Income lower than cost of living	0.37	0.48	0	10,750
No. correct answers	3.58	1.36	4	10,815
Risk diversification	0.75	0.43	1	10,815
Inflation	0.67	0.47	1	10,815
Numeracy	0.82	0.38	1	10,815
Compound interest (1)	0.69	0.46	1	10,815
Compound interest (2)	0.64	0.48	1	10,815
Financially literate	0.74	0.44	1	10,815
Panel B: Credit Register				
Mortgage				
Amount	11.15	1.40	11	1,718
Delinquency	0.01	0.10	0	1,718
No. Credit Products	1.18	0.44	1	1,718
Renegotiation	0.01	0.10	0	1,718
Maturity	25.65	10.09	27	1,718
Auto Loan				
Amount	8.60	2.22	9	577
Delinquency	0.01	0.10	0	577
No. Credit Products	1.06	0.23	1	577
Maturity	5.14	2.72	5	577
Credit Card				
Committed Credit	7.68	1.22	8	3,613
Utilized Credit	3.74	3.13	5	3,613
Delinquency	0.01	0.11	0	3,613
No. Credit Products	2.04	1.30	2	3,613
Overdraft				
Committed Credit	6.73	1.44	7	1,623
Utilized Credit	0.73	1.96	0	1,623
Delinquency	0.01	0.09	0	1,623
No. Credit Products	1.31	0.57	1	1,623

This table presents descriptive statistics based on the baseline survey (Panel A) and administrative credit register (Panel B). The data in Panel A are available for the first two cohorts (2023/2024 and 2024/2025), while data in panel B are available for the first cohort (2023/2024).

Table 3: Balance Tests

	Treatment Mean	Control Mean	Difference
Panel A: Baseline Survey			
Female	0.69	0.69	0.00
Age	39.02	39.09	-0.07
Household size	2.77	2.77	0.00
Household income < €2000	0.38	0.38	0.00
Higher education	0.77	0.77	0.00
Economics-related education	0.21	0.21	0.00
Attended fin. literacy before	0.13	0.13	0.00
Unemployed	0.04	0.04	0.00
Has a checking account	0.89	0.89	-0.01
Has some form of credit	0.75	0.75	0.00
Renting a home	0.20	0.19	0.01
Income lower than cost of living	0.37	0.37	-0.01
No. correct answers	3.57	3.58	0.00
Risk diversification	0.75	0.75	0.00
Inflation	0.67	0.68	0.00
Numeracy	0.82	0.82	0.00
Compound interest (1)	0.70	0.69	0.01
Compound interest (2)	0.64	0.64	0.00
Financially literate	0.74	0.74	0.00
Panel B: Credit Register			
Mortgage			
Amount	11.14	11.15	-0.01
Delinquency	0.01	0.01	0.00
No. Credit Products	1.18	1.17	0.01
Renegotiation	0.01	0.01	0.00
Maturity	25.95	25.34	0.61
Auto Loan			
Amount	8.75	8.44	0.31*
Delinquency	0.01	0.01	-0.01
No. Credit Products	1.04	1.07	-0.03
Maturity	5.12	5.15	-0.03
Credit Card			
Committed Credit	7.69	7.68	0.01
Utilized Credit	3.81	3.68	0.13
Delinquency	0.02	0.01	0.01*
No. Credit Products	2.04	2.03	0.01
Overdraft			
Committed Credit	6.68	6.77	-0.10
Utilized Credit	0.69	0.76	-0.07
Delinquency	0.01	0.00	0.01**
No. Credit Products	1.31	1.31	0.00

This table presents balance tests of baseline characteristics between the treatment and control group. The last column shows mean differences. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 4: Financial Knowledge

	No. Correct Answers				Financially Literate
	(1)	(2)	(3)	(4)	(5)
Treatment	0.333***	0.323***	0.324***		0.086***
	[0.030]	[0.026]	[0.026]		[0.009]
Treatment (up to 3 Classes)				-0.034	
				[0.053]	
Treatment (4 Classes)				0.274***	
				[0.055]	
Treatment (5 Classes)				0.419***	
				[0.028]	
Female		-0.122***			
		[0.029]			
Age		-0.002	-0.002	-0.003*	-0.000
		[0.001]	[0.001]	[0.001]	[0.000]
Household size		-0.012	-0.010	-0.012	0.000
		[0.011]	[0.011]	[0.011]	[0.004]
Household income < €2000		-0.062**			
		[0.030]			
Higher education		0.056*			
		[0.034]			
Economics-related education		0.011	0.011	0.018	0.001
		[0.033]	[0.033]	[0.033]	[0.011]
Attended fin. literacy before		0.001	0.005	0.011	0.015
		[0.036]	[0.036]	[0.036]	[0.012]
Unemployed		0.016	0.005	0.003	-0.012
		[0.078]	[0.079]	[0.079]	[0.027]
Has a checking account		0.153***	0.154***	0.150***	0.079***
		[0.053]	[0.053]	[0.052]	[0.018]
Has some form of credit		0.015			
		[0.034]			
Renting a home		0.047	0.047	0.047	0.020*
		[0.036]	[0.037]	[0.036]	[0.012]
Income lower than cost of living		-0.111***	-0.107***	-0.099***	-0.044***
		[0.030]	[0.030]	[0.029]	[0.010]
In-person		-0.032			
		[0.032]			
No. correct answers		0.404***	0.404***	0.402***	
		[0.012]	[0.012]	[0.012]	
Financially literate					0.249***
					[0.014]
Constant	3.827***	2.425***	2.354***	2.393***	0.564***
	[0.024]	[0.105]	[0.097]	[0.097]	[0.031]
Strata × Cohort Fixed Effects	No	No	Yes	Yes	Yes
Observations	5,971	5,946	5,946	5,946	5,946
R-squared	0.020	0.258	0.261	0.272	0.131
Avg. Baseline	3.63	3.63	3.63	3.63	0.76

This table shows the treatment effect on financial knowledge (6-month follow-up survey) following equation (1). The outcome variables are the number of correct answers to the five financial literacy questions and the financially literate indicator. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 5: Financial Knowledge: Heterogeneous Effects

	Treatment		Treatment × *Variable*	
Variable	(1)	(2)	(3)	(4)
Female	0.218***	[0.045]	0.151***	[0.055]
Age	0.114	[0.102]	0.055**	[0.025]
Household size	0.358***	[0.064]	-0.011	[0.021]
Household income < €2000	0.281***	[0.033]	0.106*	[0.055]
No tertiary education	0.303***	[0.030]	0.108*	[0.065]
No economics-related education	0.232***	[0.059]	0.115*	[0.066]
No financial literacy exposure	0.211***	[0.066]	0.132*	[0.072]
Unemployed	0.328***	[0.027]	-0.182	[0.144]
No checking account	0.309***	[0.027]	0.112	[0.106]
No credit product	0.321***	[0.030]	0.006	[0.064]
Renting a home	0.352***	[0.029]	-0.165**	[0.070]
Income lower than cost of living	0.275***	[0.032]	0.129**	[0.057]
Non-financially literate	0.244***	[0.027]	0.314***	[0.073]
In-person	0.323***	[0.030]	0.014	[0.063]

This table shows heterogeneity in treatment effects on financial knowledge (6-month follow-up survey) across baseline characteristics. For each baseline characteristic, we estimate a regression that includes the full set of interactions between that characteristic and treatment, the remaining control variables, the baseline outcome variable, strata × cohort fixed effects. We report the treatment and the treatment interaction with the baseline characteristic. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 6: Financial Attitudes and Confidence

	I am satisfied with my current financial situation	My financial situation does not limit my ability to do things that are important to me	I set long-term savings goals and do everything to achieve them	How do you assess your financial knowledge compared to the average of the Portuguese population?
	(1)	(2)	(3)	(4)
Treatment	0.170***	0.075***	0.114***	0.231***
	[0.022]	[0.025]	[0.022]	[0.016]
Observations	6,037	6,037	6,037	5,885
R-squared	0.342	0.221	0.276	0.367
Avg. Baseline	2.54	2.73	3.27	3.01

This table shows the treatment effect on financial sentiment and financial knowledge self-assessment outcomes (6-month follow-up survey) following equation (1). The financial sentiment questions (first three columns) are measured on a scale 1 - Totally Disagree to 5 - Totally Agree. The knowledge assessment question (column (4)) is measured on a scale 1 - Well Below Average to 5 - Well Above Average. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 7: Financial Decision Making and Behaviors

Panel A: Financial Decision Making and Behaviors

	Financial Autonomy	Creates a plan to manage income and expenses	Keeps track of expenditures	Separates money for bills from daily spending	Sets up automatic payments for regular expenses	Financial Decision Making Index
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.007**	0.061***	0.016	0.007	-0.004	0.021***
	[0.004]	[0.012]	[0.012]	[0.011]	[0.010]	[0.006]
Observations	5,913	6,013	6,013	6,013	6,013	6,013
R-squared	0.217	0.170	0.195	0.146	0.247	0.259
Avg. Baseline	0.97	0.43	0.51	0.29	0.71	0.49

Panel B: Other Financial Behaviors

	I prepared an action plan	I saved or invested money	I looked for new or additional income sources	I reduced expenses	I increased my credit card limit or loan payments	I identified a way to access credit	Financial Behaviors Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	0.075***	0.054***	0.044***	0.033***	-0.006**	-0.016***	0.038***
	[0.011]	[0.011]	[0.011]	[0.012]	[0.003]	[0.005]	[0.004]
Observations	6,013	6,013	6,013	6,013	6,013	6,013	6,013
R-squared	0.125	0.193	0.124	0.056	0.046	0.041	0.217
Avg. Baseline	0.23	0.65	0.31	0.62	0.02	0.05	0.62

This table shows the treatment effect on financial decision-making and behavior outcomes (6-month follow-up survey) following equation (1). The financial decision-making index (column (6)) is the sum of the outcome variables in columns (2)-(5) divided by four. The financial behaviors index (column (7)) is constructed by summing the outcome variables in columns (1)-(4), as well as one minus the outcome variables in columns (5) and (6), and dividing the total by six. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 8: Retirement Confidence and Financing

	Confident that is doing (or have done) good financial planning for retirement	Social security or related	Employer's pension plan	Private retirement savings plan	Sale of non-financial assets I own (car, property, art, jewelry, antiques, etc.)	Income generated by financial or non-financial assets I own	Help from my spouse/ partner	Help from my children or other family members	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment	0.215***	-0.019**	0.001	0.051***	0.008*	0.054***	0.002	0.000	-0.002
	[0.024]	[0.008]	[0.005]	[0.011]	[0.005]	[0.011]	[0.007]	[0.002]	[0.004]
Observations	5,694	6,071	6,071	6,071	6,071	6,071	6,071	6,071	6,071
R-squared	0.329	0.097	0.407	0.306	0.046	0.232	0.112	0.025	0.028
Avg. Baseline	2.50	0.84	0.07	0.35	0.03	0.18	0.07	0.01	0.03

This table shows the treatment effect on retirement confidence and sources of retirement financing (6-month follow-up survey) following equation (1). The retirement confidence question (column (1)) is measured on a scale 1 - Not Confident at All to 5 - Completely Confident. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 9: Financial Assets

Panel A: Knows the Product

	Checking accounts	Fixed-term deposits and Treasury certificates	Bonds	Stocks, ETFs, Investment funds and Financial insurance	Crypto-currencies or NFTs	Retirement savings plans or pension funds	Awareness Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	0.005**	0.010***	0.034***	0.048***	0.021***	0.005***	0.021***
	[0.002]	[0.003]	[0.005]	[0.007]	[0.004]	[0.002]	[0.003]
Observations	6,007	6,007	6,007	6,007	6,007	6,007	6,007
R-squared	0.014	0.047	0.062	0.055	0.045	0.027	0.067
Avg. Baseline	0.98	0.97	0.90	0.81	0.91	0.98	0.92

Panel B: Holds the Product

	Checking accounts	Fixed-term deposits and Treasury certificates	Bonds	Stocks, ETFs, Investment funds and Financial insurance	Crypto-currencies or NFTs	Retirement savings plans or pension funds	Holdings Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment	0.020***	0.012	0.012*	0.049***	-0.004	0.010	0.016***
	[0.007]	[0.008]	[0.007]	[0.010]	[0.007]	[0.009]	[0.004]
Observations	6,007	6,007	6,007	6,007	6,007	6,007	6,007
R-squared	0.132	0.362	0.208	0.354	0.443	0.478	0.510
Avg. Baseline	0.91	0.79	0.07	0.39	0.15	0.45	0.46

This table shows the treatment effect on awareness about financial products (Panel A) and holdings of those products (Panel B) (6-month follow-up survey) following equation (1). The awareness and holdings indexes (column (7)) are the sum of the outcome variables in columns (1) to (6) divided by six. Robust standard errors are reported in parentheses. *, **, *** Significance at 10, 5 and 1%, respectively.

Table 10: Financial Liabilities

Panel A: Knows the Product

	Mortgage			Other Consumer Credit				
	Variable rate	Mixed rate	Fixed rate	Auto loan	Personal loan	Credit card	Bank overdraft	Awareness Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.002	0.006***	0.003*	0.002	0.003**	0.003**	0.027***	0.009***
	[0.002]	[0.002]	[0.002]	[0.001]	[0.001]	[0.001]	[0.005]	[0.002]
Observations	6,007	6,007	6,007	6,007	6,007	6,007	6,007	6,007
R-squared	0.021	0.020	0.025	0.022	0.019	0.018	0.071	0.047
Avg. Baseline	0.99	0.98	0.98	0.99	0.99	1.00	0.90	0.97

Panel B: Holds the Product

	Mortgage			Other Consumer Credit				
	Variable rate	Mixed rate	Fixed rate	Auto loan	Personal loan	Credit card	Bank overdraft	Holdings Index
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	-0.022**	0.012	-0.007	-0.019**	-0.006	-0.010	-0.006	-0.010**
	[0.009]	[0.008]	[0.007]	[0.008]	[0.007]	[0.011]	[0.007]	[0.005]
Observations	6,007	6,007	6,007	6,007	6,007	6,007	6,007	6,007
R-squared	0.525	0.241	0.204	0.346	0.378	0.308	0.338	0.442
Avg. Baseline	0.41	0.09	0.09	0.21	0.17	0.61	0.13	0.28

This table shows the treatment effect on awareness about financial liability products (Panel A) and holdings of those products (Panel B) (6-month follow-up survey) following equation (1). The consumer credit awareness and holdings indexes (column (8)) are the sum of the outcome variables in columns (4) to (7) divided by four. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 11: Financial Distress and Income Generation in Case of Distress

	Event of not enough income to cover cost of living	I would use money from my savings	I would reduce expenses	I would sell an asset	I would work longer hours to earn more money	I would ask for help from family, friends, or the commu-nity	I would ask my employer for a salary advance or a loan	I would pawn assets	I would use existing credit (e.g., overdraft, credit card, etc.)	I would take out a new loan	I would pay my bills late or not pay them
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Treatment	-0.050***	-0.030**	0.021***	0.005	0.037***	-0.010	-0.000	0.001	-0.030***	-0.005*	-0.008**
	[0.010]	[0.012]	[0.008]	[0.011]	[0.012]	[0.008]	[0.003]	[0.002]	[0.006]	[0.003]	[0.003]
Observations	6,071	6,071	6,071	6,071	6,071	6,071	6,071	6,071	6,071	6,071	6,071
R-squared	0.273	0.085	0.051	0.123	0.159	0.091	0.049	0.037	0.169	0.040	0.088
Avg. Baseline	0.36	0.48	0.87	0.22	0.37	0.13	0.01	0.00	0.08	0.01	0.02

This table shows the treatment effect on financial distress and coping responses (6-month follow-up survey) following equation (1). Robust standard errors are reported in parentheses. *, **, *** Significance at 10, 5 and 1%, respectively.

Table 12: Amount of Credit: Credit Register Data

	Mortgage		Auto Loan		Credit Card				Overdraft			
	Amount		Amount		Utilized Credit		Committed Credit		Utilized Credit		Committed Credit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	-0.005		-0.009		-0.128**		0.006		-0.022		0.009	
	(0.019)		(0.075)		(0.059)		(0.015)		(0.057)		(0.023)	
Treatment $t = 0$		0.025		-0.003		-0.092		0.011		-0.041		-0.003
		(0.027)		(0.100)		(0.065)		(0.015)		(0.067)		(0.033)
Treatment $t = 1$		0.031		-0.066		-0.092		-0.009		0.017		-0.025
		(0.023)		(0.116)		(0.065)		(0.018)		(0.069)		(0.034)
Treatment $t = 2$		-0.021		0.061		-0.149**		0.006		0.011		-0.014
		(0.037)		(0.096)		(0.067)		(0.017)		(0.070)		(0.034)
Treatment $t = 3$		-0.016		-0.063		-0.107		0.007		-0.064		0.052**
		(0.034)		(0.116)		(0.067)		(0.017)		(0.071)		(0.025)
Treatment $t = 4$		-0.010		0.073		-0.163**		-0.000		-0.063		0.025
		(0.034)		(0.095)		(0.070)		(0.018)		(0.072)		(0.028)
Treatment $t = 5$		-0.018		-0.012		-0.122*		0.011		-0.002		0.049*
		(0.036)		(0.095)		(0.069)		(0.018)		(0.071)		(0.029)
Treatment $t = 6$		-0.028		-0.048		-0.174**		0.018		-0.010		-0.019
		(0.035)		(0.105)		(0.071)		(0.018)		(0.070)		(0.032)
Observations	15,868	15,868	4,860	4,860	36,590	36,590	36,590	36,590	15,727	15,727	15,727	15,727
R-squared	0.520	0.521	0.344	0.344	0.523	0.524	0.785	0.785	0.388	0.388	0.733	0.733
Avg. Baseline	11.15	11.15	8.60	8.60	3.74	3.74	7.68	7.68	0.73	0.73	6.73	6.73

This table shows the treatment effect on the log amount of credit for different credit products following equation (2). All regressions include the controls listed in Table 4, the baseline outcome variable, strata × cohort fixed effects, and calendar month-year fixed effects. Robust standard errors clustered at the borrower level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 13: Loan Delinquency: Credit Register Data

	Mortgage		Auto Loan		Credit Card		Bank Overdraft	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.002		-0.009		-0.007***		-0.000	
	(0.003)		(0.007)		(0.003)		(0.002)	
Treatment $t = 0$		0.004		-0.011		-0.005*		0.001
		(0.003)		(0.009)		(0.003)		(0.002)
Treatment $t = 1$		0.002		-0.005		-0.006**		0.000
		(0.003)		(0.008)		(0.003)		(0.002)
Treatment $t = 2$		0.003		-0.004		-0.007**		0.002
		(0.004)		(0.008)		(0.003)		(0.002)
Treatment $t = 3$		0.001		-0.009		-0.010***		-0.000
		(0.003)		(0.009)		(0.003)		(0.002)
Treatment $t = 4$		0.005		-0.017*		-0.007**		-0.001
		(0.004)		(0.009)		(0.003)		(0.002)
Treatment $t = 5$		0.001		-0.011		-0.008**		-0.004*
		(0.004)		(0.010)		(0.003)		(0.002)
Treatment $t = 6$		-0.000		-0.006		-0.007**		-0.001
		(0.004)		(0.010)		(0.003)		(0.003)
Observations	15,868	15,868	4,860	4,860	36,590	36,590	15,727	15,727
R-squared	0.349	0.349	0.337	0.337	0.258	0.258	0.693	0.693
Avg. Baseline	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

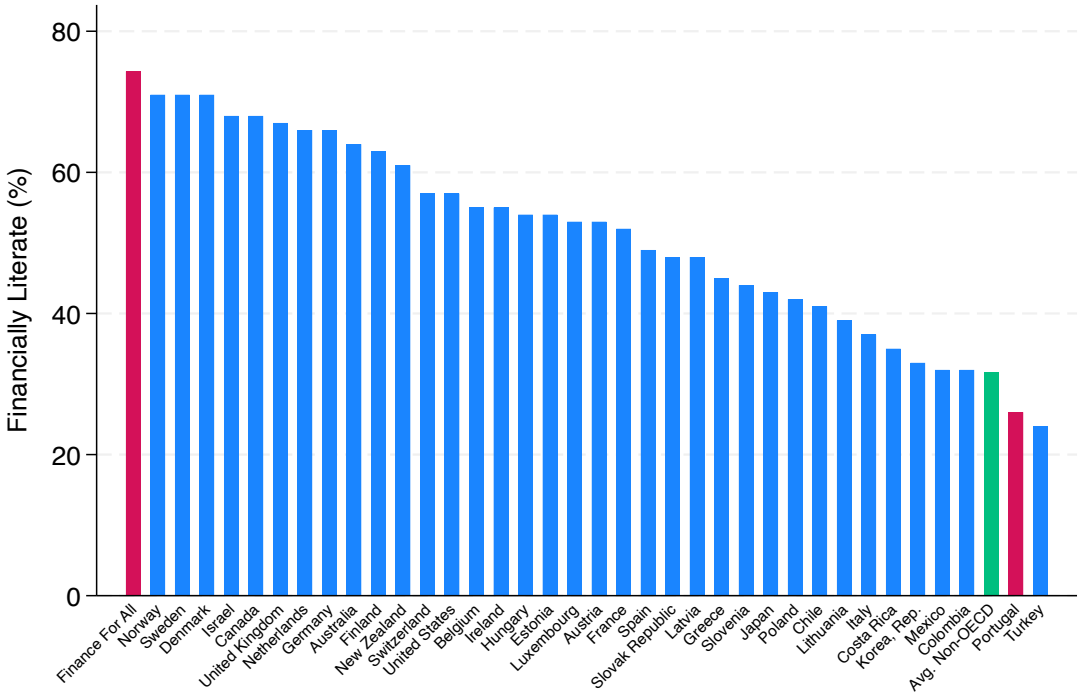
This table shows the treatment effect on a dummy variable that equals one for delinquent loans on different credit products following equation (2). All regressions include the controls listed in Table 4, the baseline outcome variable, strata × cohort fixed effects, and calendar month-year fixed effects. Robust standard errors clustered at the borrower level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table 14: Renegotiations and Number of Products: Credit Register Data

	Mortgage				Auto Loan		Credit Card		Bank Overdraft	
	Renegotiations		No. Products		No. Products		No. Products		No. Products	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	0.011**		-0.018*		-0.016		0.005		0.015	
	(0.006)		(0.011)		(0.014)		(0.019)		(0.013)	
Treatment $t = 0$		0.014**		-0.018*		-0.011		0.002		0.025*
		(0.007)		(0.011)		(0.013)		(0.018)		(0.014)
Treatment $t = 1$		0.015**		-0.025**		-0.025*		0.001		0.017
		(0.007)		(0.011)		(0.013)		(0.018)		(0.014)
Treatment $t = 2$		0.013*		-0.018		-0.022		0.001		0.009
		(0.007)		(0.011)		(0.015)		(0.019)		(0.013)
Treatment $t = 3$		0.011*		-0.015		-0.013		-0.002		0.017
		(0.006)		(0.012)		(0.017)		(0.019)		(0.014)
Treatment $t = 4$		0.010		-0.023**		-0.011		0.000		0.012
		(0.006)		(0.012)		(0.017)		(0.020)		(0.014)
Treatment $t = 5$		0.008		-0.011		-0.014		0.009		0.013
		(0.006)		(0.013)		(0.017)		(0.021)		(0.014)
Treatment $t = 6$		0.007		-0.013		-0.018		0.019		0.014
		(0.006)		(0.013)		(0.018)		(0.021)		(0.014)
Observations	15,868	15,868	15,868	15,868	4,860	4,860	36,590	36,590	15,727	15,727
R-squared	0.025	0.026	0.721	0.721	0.536	0.537	0.814	0.814	0.760	0.760
Avg. Baseline	0.01	0.01	1.18	1.18	1.06	1.06	2.04	2.04	1.31	1.31

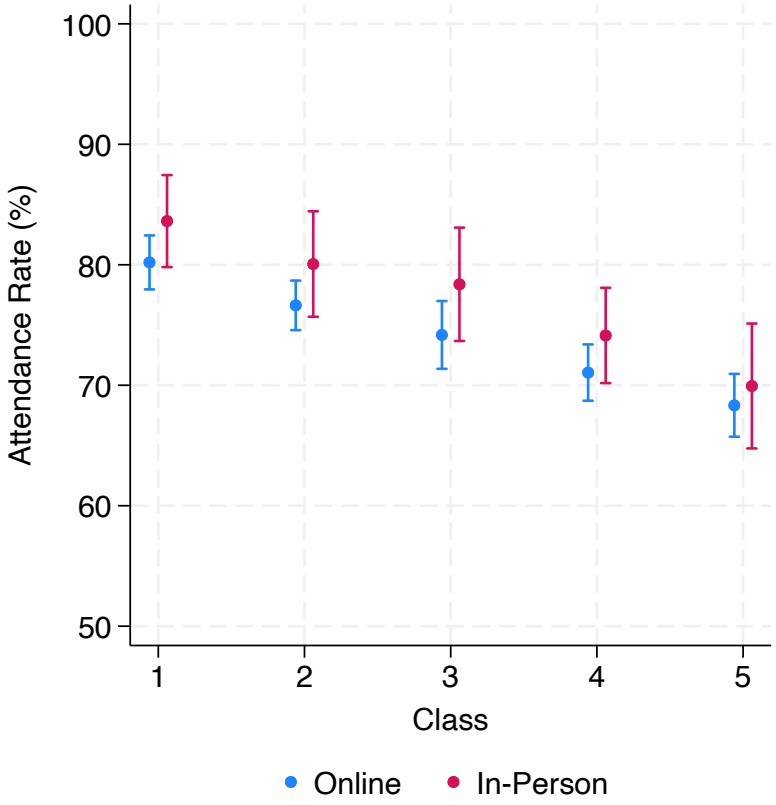
This table shows the treatment effect on a dummy variable that equals one for mortgage renegotiations (columns (1)-(2)) or the number of products (columns (3)-(10)) following equation (2). All regressions include the controls listed in Table 4, the baseline outcome variable, strata × cohort fixed effects, and calendar month-year fixed effects. Robust standard errors clustered at the borrower level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Figure 1: Comparison with Klapper and Lusardi (2020)



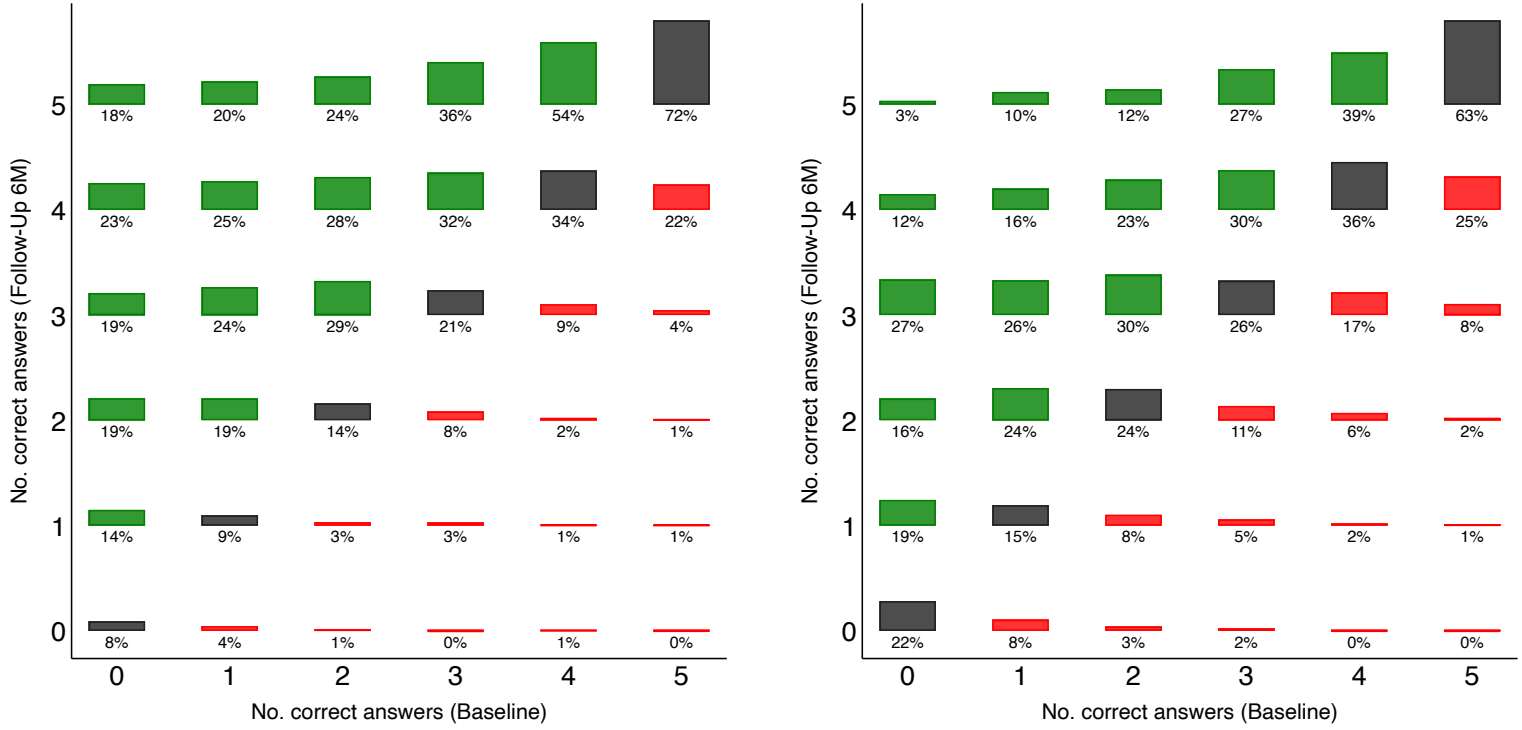
This figure compares the percentage of financially literate individuals in our sample with all countries analyzed in Klapper and Lusardi (2020). Individuals are considered to be financially literate if they know at least three out of four concepts.

Figure 2: Class Attendance



This figure shows average class attendance rates (cumulative) and respective 95% confidence intervals over the five sessions, split by in-person and online formats.

Figure 3: No. Correct Answers in Six-Month Follow-Up and Baseline

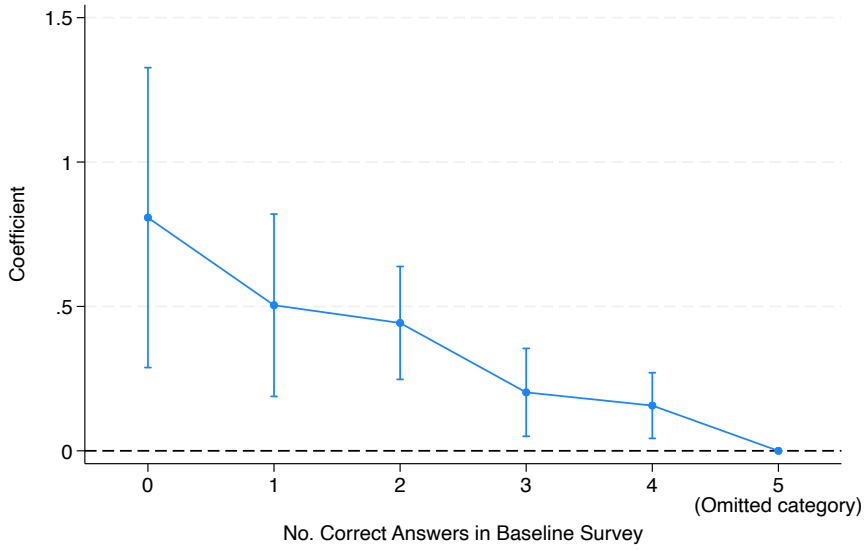


(a) Treatment

(b) Control

This figure plots the percentage of people that answers correctly a given number of financial literacy questions in the six-month follow-up survey (vertical axis) conditional on the number of correct answers in the baseline survey (horizontal axis) for treatment and control groups. The percentages sum up to one vertically.

Figure 4: Effect of Treatment by Baseline Financial Literacy Levels



This figure displays the coefficients and 95% confidence intervals of a regression where we run financial knowledge in the six-month follow-up survey on the treatment interacted with baseline knowledge (number of correct answers to the five financial literacy questions in the baseline survey). This regression includes the interactions of baseline knowledge with all the remaining controls included in Table 4, including cohort and strata fixed effects. Individuals who answered the five questions correctly are the omitted category.

Internet Appendix for

Finance for All: Experimental Evidence of a Financial Literacy Program

Table IA.1: Descriptive Statistics

	Mean	SD	Min	Median	Max	Observations
Panel A: Experimental Statistics (treatment group)						
In-person	0.22	0.41	0	0	1	5,415
No. classes attended	3.77	1.84	0	5	5	5,415
Attended at least one class	0.87	0.34	0	1	1	5,415
No. quizzes answered	3.43	1.88	0	4	5	5,415
Panel B: Exit Survey (treatment group)						
Answered exit survey	0.63	0.48	0	1	1	5,415
No. correct answers	4.27	0.93	0	5	5	3,391
Financially literate	0.92	0.27	0	1	1	3,391
Course satisfaction	4.53	0.72	1	5	5	3,295
Panel C: 6-Month Follow-up Survey						
Answered follow-up 6M survey	0.58	0.49	0	1	1	10,815
No. correct answers	4.01	1.17	0	4	5	5,971
Financially literate	0.84	0.36	0	1	1	5,971

This table presents experiment statistics (Panel A), exit survey statistics (Panel B), and 6-month follow-up survey statistics (Panel C).

Table IA.2: Balance Tests among 6-Month Follow-Up Survey Respondents

	Treatment Mean	Control Mean	Difference
Female	0.71	0.71	-0.01
Age	39.61	39.43	0.18
Household size	2.78	2.75	0.03
Household income < €2000	0.38	0.39	-0.01
Higher education	0.78	0.79	-0.01
Economics-related education	0.21	0.21	-0.01
Attended fin. literacy before	0.14	0.14	0.00
Unemployed	0.04	0.03	0.00
Has a checking account	0.90	0.91	-0.01
Has some form of credit	0.77	0.76	0.00
Renting a home	0.18	0.19	-0.01
Income lower than cost of living	0.35	0.37	-0.02*
No. correct answers	3.64	3.61	0.03
Risk diversification	0.77	0.76	0.01
Inflation	0.68	0.69	0.00
Numeracy	0.83	0.83	0.00
Compound interest (1)	0.71	0.69	0.02
Compound interest (2)	0.65	0.65	0.00
Financially literate	0.76	0.75	0.01

This table presents balance tests of baseline characteristics between the treatment and control group for the sub-sample that answered the 6-month follow-up survey. The last column shows mean differences. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.3: Sample of Participants that Answered the Follow-Up Survey

	(1)	(2)	(3)	(4)
Treatment	0.065***	0.064***	0.064***	
	[0.009]	[0.009]	[0.009]	
Treatment (Up to 3 Classes)				-0.151***
				[0.014]
Treatment (4 Classes)				0.053***
				[0.020]
Treatment (5 Classes)				0.165***
				[0.010]
Female		0.059***		
		[0.011]		
Age		0.002***	0.002***	0.001***
		[0.000]	[0.000]	[0.000]
Household size		0.002	0.002	0.002
		[0.004]	[0.004]	[0.004]
Household income $<$ €2000		0.023**		
		[0.010]		
Higher education		0.019		
		[0.012]		
Economics-related education		-0.015	-0.015	-0.011
		[0.012]	[0.012]	[0.012]
Attended fin. literacy before		0.032**	0.033**	0.036***
		[0.014]	[0.014]	[0.014]
Unemployed		-0.021	-0.021	-0.016
		[0.026]	[0.026]	[0.025]
Has a checking account		0.075***	0.074***	0.064***
		[0.016]	[0.016]	[0.015]
Has some form of credit		0.022*		
		[0.012]		
Renting a home		-0.016	-0.017	-0.014
		[0.013]	[0.013]	[0.012]
Income lower than cost of living		-0.017*	-0.017*	-0.007
		[0.010]	[0.010]	[0.010]
No. correct answers		0.015***	0.015***	0.012***
		[0.004]	[0.004]	[0.004]
In-person		0.023**		
		[0.011]		
Constant	0.545***	0.265***	0.353***	0.393***
	[0.007]	[0.032]	[0.030]	[0.029]
Strata × Cohort Fixed Effects	No	No	Yes	Yes
Observations	10,815	10,750	10,750	10,750
R-squared	0.004	0.022	0.024	0.062
Avg. Baseline	N.A.	N.A.	N.A.	N.A.

This table shows the determinants of answering the 6-month follow-up survey. The outcome variable is a binary variable equal to one when the participant answered the survey. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.4: Financial Knowledge: Answer to Specific Question

	Risk Diversification		Inflation		Numeracy		Compound Interest (1)		Compound Interest (2)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment	0.082***	0.081***	0.077***	0.078***	0.038***	0.038***	0.070***	0.069***	0.057***	0.058***
	[0.008]	[0.008]	[0.012]	[0.011]	[0.009]	[0.008]	[0.010]	[0.009]	[0.011]	[0.010]
Risk diversification		0.217***								
		[0.014]								
Inflation				0.279***						
				[0.015]						
Numeracy						0.197***				
						[0.018]				
Compound interest (1)								0.210***		
								[0.017]		
Compound interest (2)										0.177***
										[0.017]
Constant	0.590***	0.540***	0.552***	0.522***	0.521***	0.496***	0.418***	0.457***	0.273***	0.322***
	[0.029]	[0.028]	[0.039]	[0.038]	[0.032]	[0.031]	[0.034]	[0.033]	[0.036]	[0.036]
Observations	5,946	5,946	5,946	5,946	5,946	5,946	5,946	5,946	5,946	5,946
R-squared	0.126	0.180	0.044	0.106	0.080	0.112	0.143	0.174	0.163	0.181
Avg. Baseline	0.76	0.76	0.68	0.68	0.83	0.83	0.70	0.70	0.65	0.65

This table shows the treatment effect on specific financial knowledge, i.e., whether the participant answers correctly each of the five financial literacy questions in the 6-month follow-up survey following equation (1). In even columns, we control for the accuracy of the answer to the respective question in the baseline survey (ANCOVA). Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.5: Financial Knowledge: Mediated by Exit Survey

	No. Correct Answers	
	(1)	(2)
Treatment × Improve	0.697***	
	[0.037]	
Treatment × No Improve	0.186***	
	[0.030]	
Treatment × Improve 3, 4 or 5 Questions		1.342***
		[0.186]
Treatment × Improve 1 or 2 Questions		0.643***
		[0.037]
Treatment × Improve 0 Questions		0.244***
		[0.031]
Treatment × Improve < 0 Questions		-0.056
		[0.052]
Observations	5,122	5,000
R-squared	0.296	0.309
Avg. Baseline	3.64	3.69

This table shows how the 6-month post-treatment financial knowledge correlates with the immediate post-treatment financial knowledge assessed through an exit survey. We extend equation (1) with interactions of the treatment with improvements in the exit survey relative to the baseline survey. In column (1), we split groups of participants based on whether they improved knowledge (answers at least one more answer correctly) in the exit survey relative to the baseline survey. In column (2), we further disaggregate the improvements into 3, 4 or 5 more correct answers, 1 or 2 more correct answers, no change (0 correct answers), or a decrease in the number of correct answers. The control group is set to zero. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.6: Financial Knowledge: Lee Bounds and Propensity Score Matching

Panel A: Lee Bounds		
	No. Correct Answers	
	(1)	(2)
Lower	0.210***	0.212***
	(0.036)	(0.041)
Upper	0.644***	0.590***
	(0.039)	(0.047)
CI Left Bound	0.150	0.144
CI Right Bound	0.707	0.667
Observations	10,815	10,781
Tightened Bounds	No	Strata

Panel B: Propensity Score Matching		
	No. Correct Answers	
	(1)	(2)
Treatment	0.329***	0.305***
	(0.0299)	(0.0309)
Observations	5,971	5,946
Matching Variables	Strata	Extended Set

In panel A of this table, we report Lee Bounds following Lee (2009), that estimates treatment effect bounds for samples with non-random sample selection/attrition. We implement this test with the Stata command *leebounds*. In column (2) we tighten the bounds by strata and cohort (we drop cells that have lower than 10 observations). In panel B, we perform nearest-neighbor propensity score matching within cohort using either the variables included in the strata (column (1)) or an extended set of variables (column (2)) corresponding to the variables used in Table 4. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.7: Attention

Panel A: When Contracting Financial Products

	Reads carefully	Reads carefully or skims through	Does not read
	(1)	(2)	(3)
Treatment	0.055***	0.016***	-0.016***
	[0.012]	[0.005]	[0.005]
Observations	5,985	5,985	5,985
R-squared	0.179	0.105	0.105
Avg. Baseline	0.45	0.91	0.09

Panel B: Checks Performance of Financial Investments (sample of all participants)

	At least weekly	At least monthly	At least quarterly	At least annually	Does not check
	(1)	(2)	(3)	(4)	(5)
Treatment	0.019**	0.037***	0.043***	0.040***	-0.012**
	[0.009]	[0.011]	[0.011]	[0.009]	[0.006]
Observations	5,928	5,928	5,928	5,928	5,928
R-squared	0.181	0.242	0.262	0.241	0.045
Avg. Baseline	0.16	0.36	0.52	0.69	0.09

Panel C: Checks Performance of Financial Investments (sample of participants with investments)

	At least weekly	At least monthly	At least quarterly	At least annually	Does not check
	(1)	(2)	(3)	(4)	(5)
Treatment	0.016	0.026*	0.027**	0.019***	-0.019***
	[0.012]	[0.014]	[0.011]	[0.006]	[0.006]
Observations	4,300	4,300	4,300	4,300	4,300
R-squared	0.184	0.205	0.188	0.082	0.082
Avg. Baseline	0.21	0.49	0.69	0.90	0.10

This table shows the treatment effect on attention while making financial decisions, such as how carefully the participants reads financial products' contracts or the frequency at which they check the performance of financial investments following equation (1). Robust standard errors are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.8: Maturity of Credit Products: Credit Register

	Mortgage		Auto Loan	
Treatment	-0.061		-0.026	
	(0.069)		(0.085)	
Treatment $t = 0$		-0.065		-0.001
		(0.060)		(0.078)
Treatment $t = 1$		-0.087		-0.006
		(0.070)		(0.084)
Treatment $t = 2$		-0.079		0.001
		(0.072)		(0.085)
Treatment $t = 3$		-0.093		-0.016
		(0.076)		(0.089)
Treatment $t = 4$		-0.066		-0.035
		(0.076)		(0.091)
Treatment $t = 5$		-0.036		-0.069
		(0.080)		(0.092)
Treatment $t = 6$		0.002		-0.063
		(0.006)		(0.103)
Observations	15,740	15,740	4,702	4,702
R-squared	0.973	0.973	0.854	0.854
Avg. Baseline	25.7	25.7	5.14	5.14

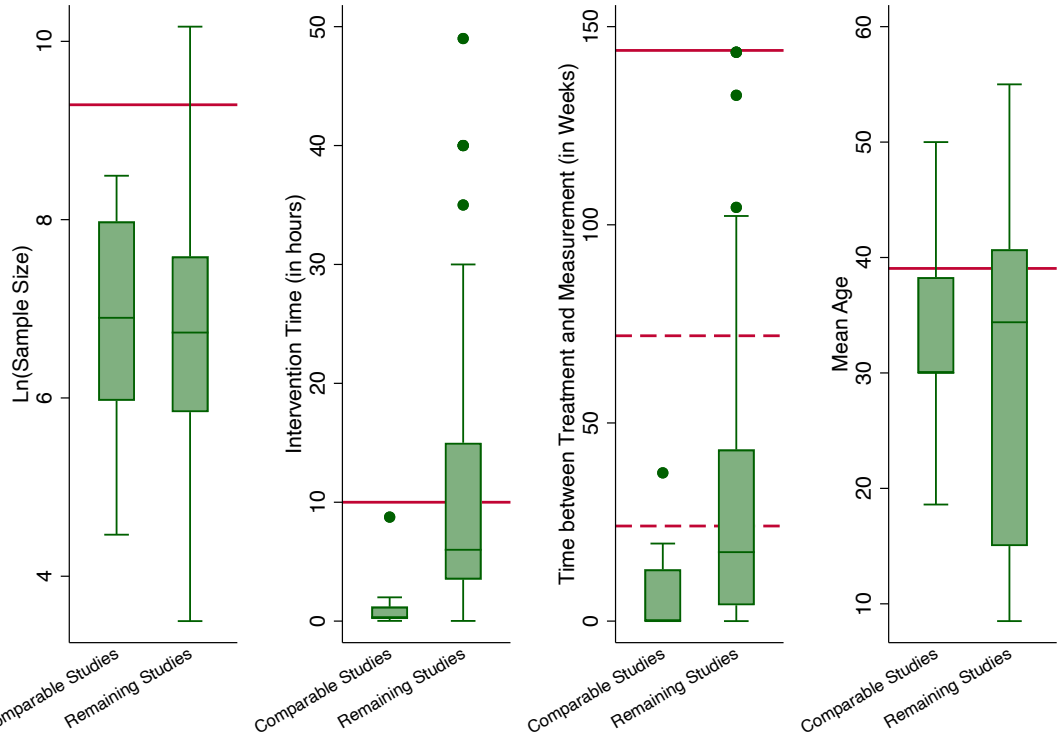
This table shows the treatment effect on maturity (in years) for different credit products following equation (2). All regressions include the controls listed in Table 4, the baseline outcome variable, strata × cohort fixed effects, and calendar month-year fixed effects. Robust standard errors clustered at the borrower level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Table IA.9: Personal Loans: Credit Register

	Amount		Delinquency		No. Products		Maturity	
Treatment	-0.058		-0.007		0.019		0.027	
	(0.084)		(0.008)		(0.040)		(0.240)	
Treatment $t = 0$		-0.086		-0.008		-0.001		-0.051
		(0.087)		(0.009)		(0.036)		(0.229)
Treatment $t = 1$		-0.123		-0.006		-0.002		-0.087
		(0.101)		(0.010)		(0.039)		(0.239)
Treatment $t = 2$		0.035		-0.009		0.028		-0.005
		(0.088)		(0.008)		(0.041)		(0.253)
Treatment $t = 3$		-0.092		-0.005		0.021		-0.049
		(0.099)		(0.010)		(0.041)		(0.253)
Treatment $t = 4$		-0.060		-0.013		0.037		0.072
		(0.102)		(0.010)		(0.044)		(0.262)
Treatment $t = 5$		-0.034		-0.010		0.020		0.139
		(0.100)		(0.010)		(0.046)		(0.263)
Treatment $t = 6$		-0.044		0.003		0.033		0.187
		(0.109)		(0.011)		(0.047)		(0.282)
Observations	7899	7899	7899	7899	7899	7899	7899	7899
R-squared	0.493	0.493	0.510	0.510	0.533	0.533	0.766	0.766
Avg. Baseline	8.07	8.07	0.04	0.04	1.37	1.37	5.56	5.56

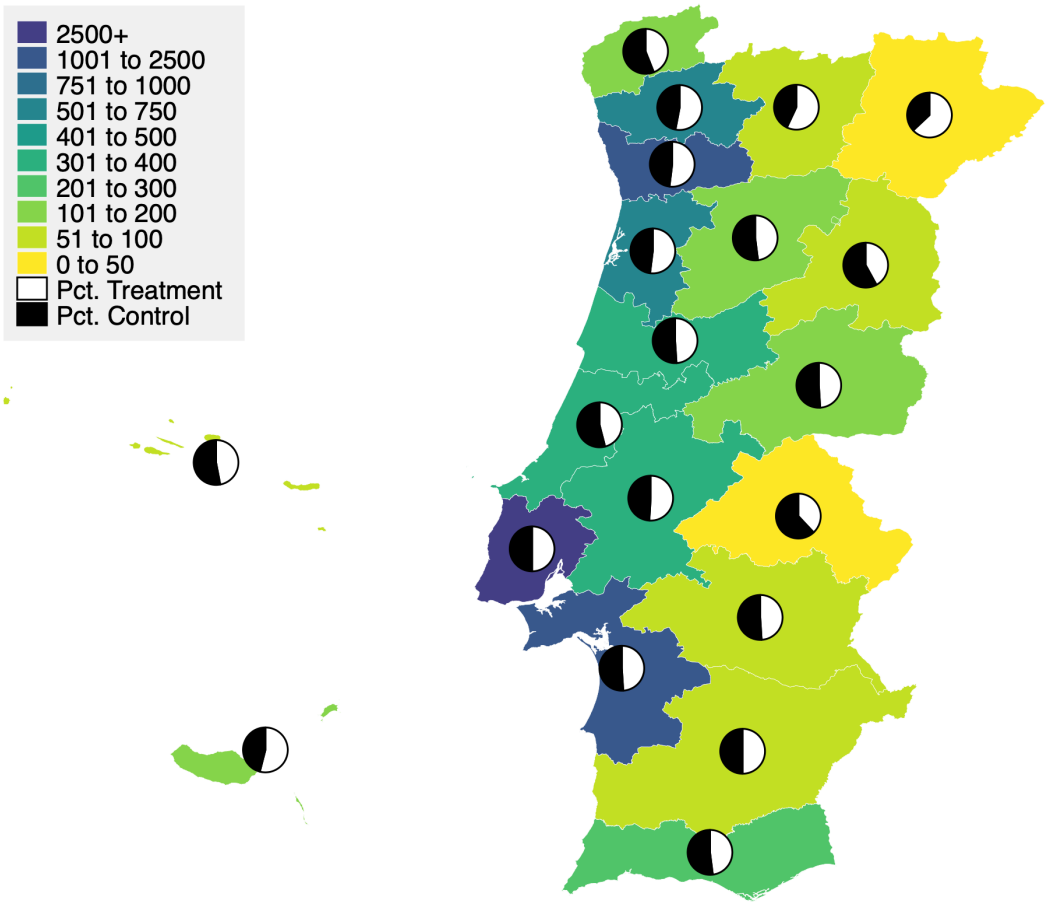
This table shows the treatment effect on the amount, delinquency, no. products, and maturity (in years) for personal loans following equation (2). All regressions include the controls listed in Table 4, the baseline outcome variable, strata × cohort fixed effects, and calendar month-year fixed effects. Robust standard errors clustered at the borrower level are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Figure IA.1: Comparison with 76 Randomized Experiments Analyzed in Kaiser et al. (2022)



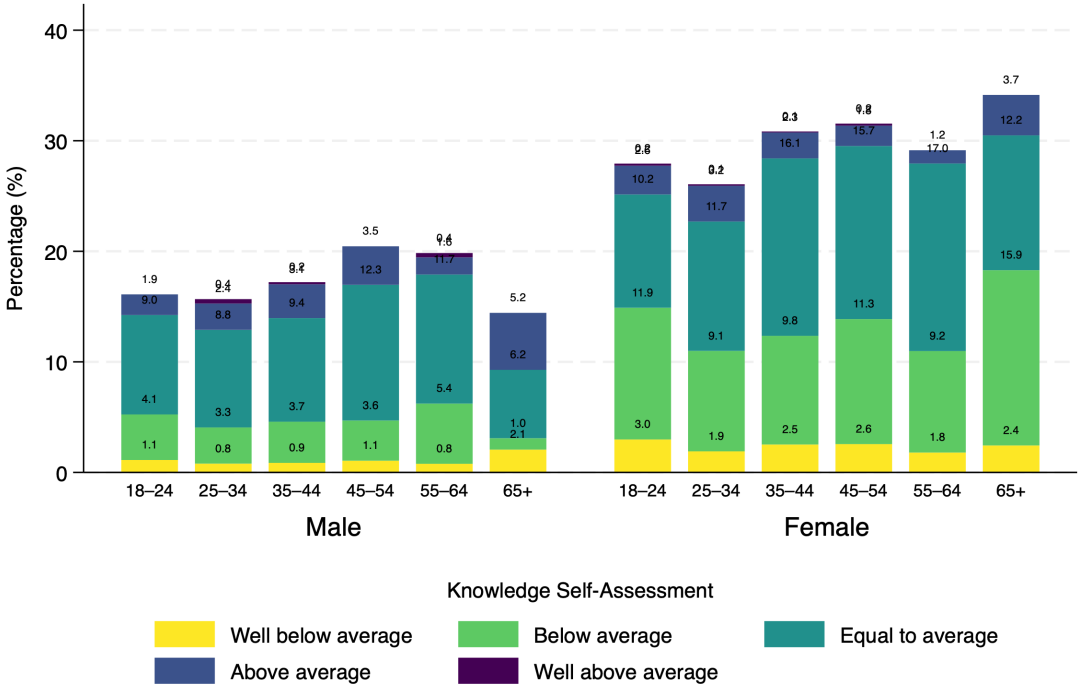
This figure presents a comparison of our experiment with the 76 financial education experiments covered in the Kaiser et al. (2022)'s meta-analysis in terms of sample size, intervention time, period of observation post-treatment, and subjects' mean age. We categorize the studies into 13 'Comparable Studies' if conducted in High Income Economies, with Mean Age above 18 and not specifically targeting low income individuals, and 63 'Remaining Studies' if otherwise. The red line represents our experiment.

Figure IA.2: Participants and Allocation to Treatment by District



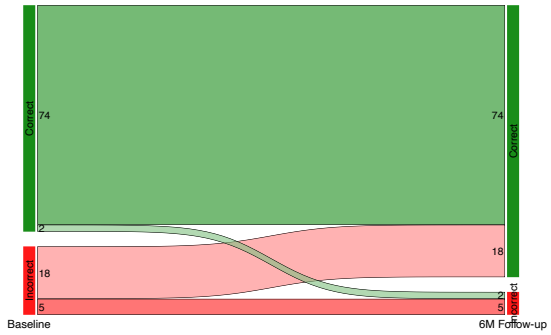
This figure shows the distribution of participants and the outcome of the random allocation to treatment and control groups by district.

Figure IA.3: Percentage of Financial Illiterate and Knowledge Self-Assessment, by Gender and Age Group

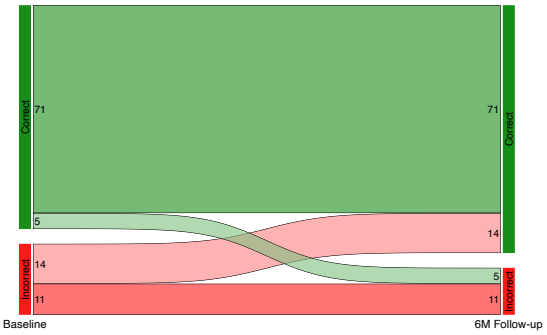


This figure shows the percentage of financial illiterate participants by gender and age group. We breakdown this total percentage by knowledge self-assessment ranking from "well below average" to "well above average".

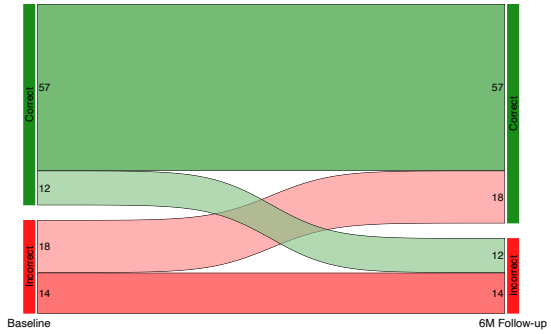
Figure IA.4: Transition Diagrams for Each Financial Literacy Question between Baseline and 6-Month Follow Up Survey



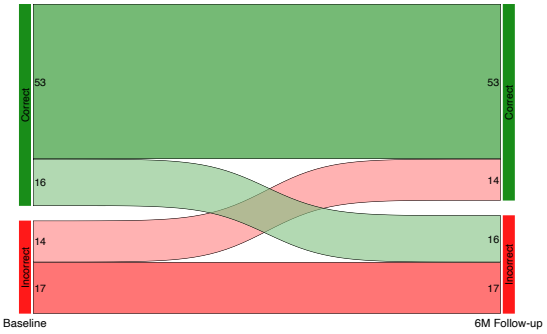
(a) Risk Diversification - Treatment



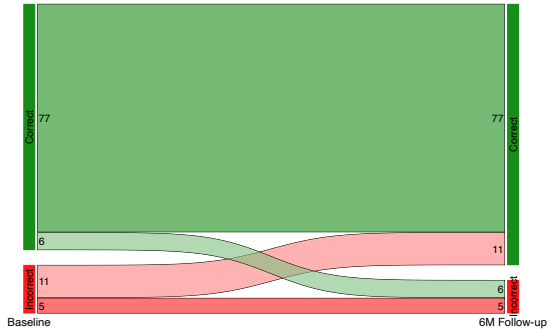
(b) Risk Diversification - Control



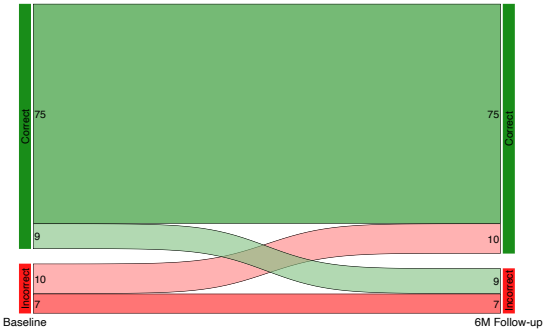
(c) Inflation - Treatment



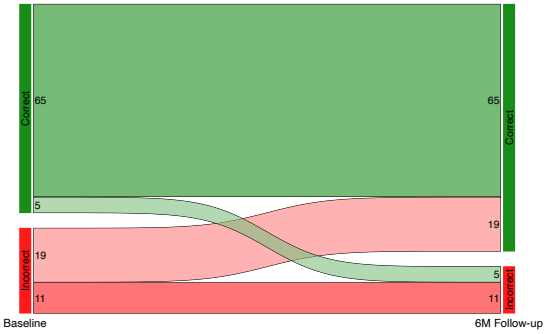
(d) Inflation - Control



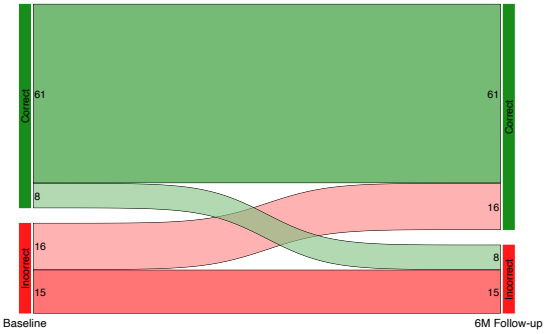
(e) Numeracy - Treatment



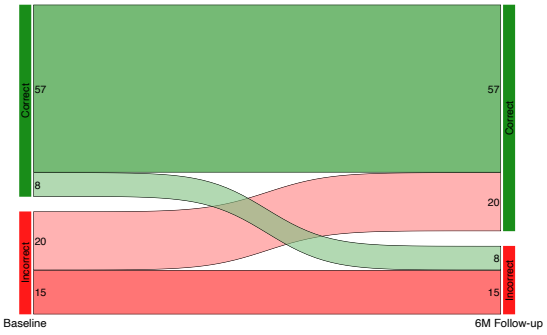
(f) Numeracy - Control



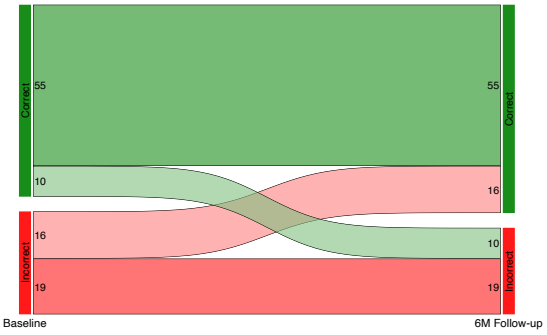
(a) Compound Interest (1) - Treatment



(b) Compound Interest (1) - Control



(c) Compound Interest (2) - Treatment



(d) Compound Interest (2) - Control

This figure shows transition diagrams for answers to each of the 5 financial literacy questions between baseline and 6-month follow-up survey separately for treatment and control groups. All numbers are presented in percentages of the total number of people in the respective treatment arm.