Online financial and demographic education for workers: Experimental evidence from an Italian Pension Fund

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Abstract
This study experimentally tests a low-cost, Internet-based, online literacy intervention program implemented with the largest employer-based pension fund in Italy. This program, called Financial Education and Planning for a Long Life included: 1) an online instructional video on financial, and demographic, (survival) literacy; 2) an experimental design to evaluate the impact of the online videoprogram on financial and demographic literacy, as well as and on short-term behavioral changes in behavior; and 3) a follow-up to assess the impact of the intervention program on subsequent choices of available investment lines in the Italian pension fund. Finlife was designed as a low-cost and, scalable approach aimed at increasing financial and demographic survival literacy, which is consistent with a 'nudge' philosophy. Based on the findings, Finlife significantly increased the financial and demographic survival literacy of the participants, and "nudged" them to actively pursue more information and becoming more active in financial decisions.

Keywords: pensions,; financial literacy,; demographic literacy,; survival literacy; field experiment,experiments; Finlife,; online financial education.

JEL Classification: J32,G53,D14,D91

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1. Introduction

This paper illustrates a low-cost and Internet-based financial and survival literacy program, *Finlife*, implemented with the largest employer-based pension fund in Italy. The program's effects are evaluated via an experiment that includes an online seminar and a randomized experimental design to evaluate the short-term impact of the online treatment on financial and survival literacy to assess the subsequent choices of investment lines within the pension fund. *Finlife* delivered a statistically significant and sizable increase in financial and survival literacy, a push in behaviors toward greater attention to information related to financial planning, and a greater probability of changing investment lines within the pension fund. Overall, our experiment shows that nudging financial and survival literacy through online programs can have a significant impact on knowledge and behavior.

In particular, financial literacy can help individuals and societies make informed financial decisions, which can lead to greater financial security and economic growth (Goyal and Kumar 2021, Hastings et al. 2013, Lusardi and Mitchell 2011).[1]

In recent decades, the aging population, the increase in expected lifetime at retirement age, and the reforms of pension systems implemented to guarantee long-term sustainability (Lee 2003) have brought about a new type of risk: longevity risk, i.e., the risk that individuals/organizations may outlive their financial resources.

[1] Lusardi and Mitchell (2007) show that working-age adults who are more financially literate are more likely to be planning for retirement. Guiso and Jappelli (2009) and Von Gaudecker (2015) show that higher financial literacy is associated with a greater propensity to diversify one's portfolio. Anderson et al. (2017) show that even among the generally high-educated population using LinkedIn, average financial literacy is low, with significant effects of misperceptions on financial products. Van Rooij et al. (2011) show that financial literacy is linked to wealth accumulation through two documented channels: first, via increasing the likelihood of participating in the stock market, and second, through fostering better planning behavior. The linkage between financial literacy and investment in higher-return risky assets is also documented by Calcagno and Monticone (2015), who also show that financial advice may not be sufficient to counteract the potential consequences of low financial literacy.

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In this regard, optimal management of longevity risk requires a combination of financial and survival literacy in order to prevent adverse financial, health, and social outcomes in the later lives of individuals and households.[2]

Thus, enhancing financial and survival literacy is a socially beneficial goal (Atkinson and Messy 2012; Hastings et al. 2013; Lusardi 2004, Lusardi and Mitchell 2014).

Since the effects of longer lives on economies and societies are already visible in many countries, especially those in which formal education has been completed by the majority of the workforce, the main challenge is to promote cost-efficient (Ghafoori et al. 2021) and scalable strategies to improve financial and survival literacy for the working-age population that cannot return to traditional education.

In this study, we examine the causal impact of the program on a sample of adult employees in Italy, a country that (along with Japan) tops the list of the world's oldest populations. Additionally, the Italian demographic developments have significantly influenced the pension reforms that began in the 1990s and the recent push toward establishing a second pillar of employer-based funds (Börsch-Supan 2005; Franco and Tommasino 2020). Our program also allows us to study the heterogeneous effects, particularly by age. In this regard, testing the impact of the program on individuals with a wide range of ages can be relevant for enhancing their financial literacy during their early years, which, in turn, can have an important influence on their eventual retirement funds (Lührmann et al. 2015; Ghafoori et al. 2021). Moreover, our approach brings survival literacy into the discussions on long-term planning, which have thus far primarily focused on financial literacy. Survival literacy, and more generally demographic literacy, might also help increase the effectiveness of financial literacy programs, since it focuses on more immediate and visible issues.

2. Literature review

To date, several studies on improving the financial literacy of adults have been conducted. For example, Bernheim and Garrett (2003) use a household survey and find that the provision

[2] By analogy to the standard definition of financial literacy, i.e., the "ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions" (Lusardi and Mitchell 2014, p. 6), survival literacy can be defined as the awareness of the need to plan for the long term given the chances of living a long life. Survival literacy is a key component of demographic literacy, i.e. the ability to understand and interpret demographic data and trends (see also Pesando et al. 2021)

of employer-based financial education is associated with a higher propensity to save funds (both in general and for retirement), while Bayer et al. (2009) show that retirement seminars tend to focus on savings plans more than the provision of written materials. This relationship is more robust for lower-income employees.

In general, participation in retirement seminars has heterogeneous effects. For instance, it is stronger for women who start from lower levels of literacy (Clark et al. 2006). While correlational evidence on the role of retirement seminars is accumulating, designs that allow for the causal identification of such effects are limited (Allen et al. 2016; Clark et al. 2017). In fact, only a few programs have led to experimental or quasi-experimental evaluations. In this regard, small-scale experiments have shown that interventions to improve financial literacy or provide more information can lead to better retirement planning in university settings (Duflo and Saez 2003; Goda et al. 2014) or for low-income families (Collins 2013). In their meta-analysis on the effect of financial literacy and financial education on behaviors, Fernandes et al. (2014) find that behaviors are minimally affected by interventions, with an even weaker effect for lower-income samples. They also indicate that financial education tends to decay over time, and correlational studies tend to exaggerate the relevance of such education. Collins and O'Rourke (2010), Meier and Sprenger (2013), and Willis (2008) question the evidence on the impact of financial education on financial literacy, based on the argument that program participation is self-selected and the evaluation of its effects does not focus on behavioral responses. However, a more recent meta-analysis by Kaiser et al. (2022) focusing on empirical evidence from randomized experiments shows that financial education programs have, on average, positive causal treatment effects on financial knowledge and downstream financial behaviors.

Causal identification with careful experimental designs is directly addressed in the up-and-coming literature on any form of advice delivered in automated formats online through the Internet, desktop computers, or personal devices, which is broadly defined as robo-advising (see D'Acunto and Rossi 2021 and D'Acunto and Rossi 2022). This branch of the literature assesses how online delivery of financial and demographic literacy content (rather than physical delivery in person) affects skills and choices. Chak et al. (2022) do not find sizable effects of providing individual decision-makers with financial education tips about their planning and choices. Gargano and Rossi (2022) provide evidence in favour of the importance of goal setting in the saving decisions of individuals. Ghafoori et al. (2021) examined a large-scale program administered by AustralianSuper, the largest superannuation pension fund in Australia. Specifically, the fund provides 90-minute retirement seminars

(held in presence, free of charge) in all of the country's major cities. Aimed at pre-retiree fund members (aged 53 and above), it uses an identification strategy that relies on the differential timing of seminar invitations. The authors found that the seminar attendees not only generated excess voluntary contributions of approximately 6% of the fund's total value, but they also displayed more sophisticated portfolio strategies.

In contrast to the research on financial literacy, the evidence on the effects of survival and demographic literacy remains limited. Among the few studies, Hurd and McGarry (2002) and Hurd (2009) focused on the subjective perceptions of survival among the older population in the United States. They found that such perceptions were generally consistent with population-level information. Based on European data, Post and Hanewald (2013, p. 201) indicated that the sample of individuals were "to some extent, aware of longevity risk." In related research, Gamble et al. (2015) provided indirect evidence for the relevance of financial education for older adults by examining the effects of aging on financial decision-making, while Finke et al. (2017) found that financial literacy linearly declines after 60 years of age. They also found that a decrease in cognition is associated with a decrease in financial literacy. Interestingly, the reduction in cognition also predicted a general drop in self-confidence, but it was not associated with a decline in the confidence of managing one's finances. However, there is no evidence on whether combining financial literacy with survival literacy can boost the impact of financial literacy programs.

3. Research setting

Our experiment was conducted in Italy, one of the leading countries with an aging population. According to the United Nations Population Division (as of 2020), 23.3% of Italy's population is aged 65 and over (45.7% aged 50+ and 7.5% aged 80+). Italy is also in the top 10 countries for life expectancy at birth (83.3 years, as of 2015–2020) and at age 65 (21.1 years).

As stated earlier, Italy's demographic developments influenced several pension reforms, starting in 1992 (see Franco and Tommasino 2020). These reforms included a postponement of the age of retirement and a move toward a notional defined contribution system, while retaining the pay-as-you-go (PAYG) funding of the public system. In addition, an important indexation of pension payments to average life expectancy at retirement was introduced. Due to these reforms, the substantial decrease in expected replacement rates (Oggero 2022) led to the development of supplementary funded pension schemes from a multi-pillar perspective.

After the first public PAYG pillar, a second pillar was created with the development of so-called "closed" pension funds (CPF), "established as non-profit institutions by trade unions and employer representatives via collective agreements, thus according to the social partners' participatory rights" (Jessoula 2018). The growth of the second pillar has been significant, also as a consequence of the option of contributing some share of workers' remuneration with favorable fiscal treatment (Gallo et al. 2018).

Since Italy is a setting in which longevity risk is relevant, we develop a low-cost, online scalable survival and financial literacy program (paired with an experimental design) for the causal identification of literacy and behavioral outcomes. We also build on the behavioral economics' "nudge" approach (Thaler and Sunstein 2008), for the purpose of maximizing the program's efficiency. Specifically, we develop and conduct an experiment on workers enrolled with the *Cometa* pension fund in Italy, which is a defined-contribution "closed" employer-based pension fund for engineering and plant installation workers. It was established as a second-pillar fund in 1997, after a collective agreement among employers' federations and trade unions, and was later extended to goldsmiths (who represented less than 0.4% of members in 2014, and are excluded from our experiment). Currently, the members include factory workers and lower-level clerks/office workers, whereas higher-level managers/executives are generally offered membership in different pension funds.

Like most closed funds in Italy, *Cometa* delegates fund management to selected asset management companies. Since 2005, it has established multiple investment lines, with different risk-return profiles in which fund members can freely choose to invest their funds. Notably, fund members have the right to modify the investment line initially selected. Hence, our target population is directly involved in actual decision-making regarding investment lines. At the end of 2014 (before *Finlife* was introduced), there were four investment lines featuring different risk-return profiles: Money Market Plus, Safety, Income, and Growth. The essential features of the four investment lines are described in Table 1.

[Insert Table 1 about here]

In 2014, *Cometa* was by far the largest closed pension fund in Italy. In fact, its members represented 21% of the entire population of subscribers to Italian closed pension funds. In the same year, the overwhelming majority of *Cometa* members were subscribers of two investment lines: Income and Money Market Plus, the safest line investing in short-term bonds. It should be noted that this situation depends on some inertial behavior, since Income

was initially chosen by many workers before 2005, when only one investment line was available. Then, after 2005, Money Market Plus became the default investment line, i.e., the line to which new members were attributed by default in the absence of an explicit choice. This evidence is in line with previous studies on the "nudge" tradition in retirement savings, which shows an inertial tendency to remain with default options (Benartzi and Thaler 2007; Beshears et al. 2009; Brown et al. 2016; Choi 2015). For instance, in 2014, 78% of new members were enrolled in Money Market Plus, which was the default choice.

In addition to choosing an investment line, members have the option to make voluntary extra contributions or request early withdrawals. Early withdrawals (up to 75% of the accumulated fund savings) must be motivated by either 1) health-related expenses, due to severe and certified health problems of the members or close relatives, or 2) first-time home buying/restructuring (for members or their children). Meanwhile, up to 30% of the accumulated fund savings can be withdrawn without a specific reason. Early withdrawals for first-time home buyers and other reasons are only available after eight years of membership in the pension fund, whereas no such limits exist for health-related early withdrawals. Before our experimental program started at the end of 2014, *Cometa* included a total of 408,797 members (407,321 from the engineering sector and 1,476 from the jewelry sector), of which approximately 140,000 had already agreed to share their e-mails with *Cometa* in order to receive periodic information and communication from the fund.

4. Program and experimental design

The primary treatment in the program is a relatively short seminar (less than 25 minutes), administered via online streaming. In order to collect information on the outcomes, we performed the following: 1) administered a follow-up online questionnaire to test the effectiveness of the program for improving demographic and financial literacy, and for increasing the willingness to acquire new information; 2) gathered administrative data from Cometa on subsequent financial decision-making by the members. We also studied the heterogeneity of the effects on age, gender, education, and occupation type.

4.1. The primary treatment: The online seminar

The primary treatment in the program was an online seminar, delivered as a video over the Internet.[3] The seminar was articulated in four sections: 1) expected lifetime and pensions; 2) the retrieval of information on retirement income; 3) the importance of investment choices in pension funds to improve the quality of life during retirement; and 4) the effects of inflation on investment decisions, and the concept of portfolio diversification. The details of each section are as follows.

Section 1 started by asking two preliminary questions on the participants' attitudes toward planning and on trust, after which the following evidence was presented regarding the increase in life expectancy at 60 years in Italy. Specifically, from 1992 to 2012, the expected lifetime at 60 years increased from 79 to 83.4 years for males and from 82.4 to 86.2 years for females. Then, it illustrated how the reform of the Italian pension system, combined with the increase in life expectancy, brought about a sizable reduction in the average replacement ratio (Whitehouse 2007). This section concluded by asking two questions about the awareness of the availability of information regarding individual pension positions through *Cometa*.

Section 2 started with a slide indicating how precise information on individual pension positions can be obtained, either online (through the *Cometa* website) or offline (by reading *Cometa's* annual individual report). Next, the participants were asked about their belief in the importance of the impact of social security choices on the quality of life after retirement. The presentation proceeded directly into Section 3, which introduced three critical concepts for investment choices: 1) the time value of money and the effects of interest compounding over time; 2) the relationship between expected returns and risks; and 3) the main characteristics of the four different investment lines available to *Cometa* members. As for the time value of money and the effects of interest compounding over time, they were both illustrated in a table, explicitly considering the impact on the terminal value of capital after reinvesting at the fixed interest (5%) paid on an initial amount of 1,000 euros for investment periods ranging from two to 40 years. The argument was extended to a further slide on the financial impact of asking for advances on pension funds, after which a question was asked on the awareness of social security choices.

Moreover, Section 3 focused on risk-return trade-offs by considering investments in stocks and bonds. In this regard, the participants were asked about the perceived relative risk of

[3] The online seminar was presented in Italian. A video of the seminar is available from the authors, upon request. We also provide an English translation of the slides used in the presentation in the Online Appendix.

investing in a government bond and in a share of a public company on the stock exchange. The relative risks of the two investment strategies were also discussed in a slide. Subsequently, a question on the chosen investment line in *Cometa* was asked, before showing how the *Cometa* website can be used to gain information on the four available investment lines and their expected returns and risks. A further slide explicitly considered the risks and returns of the Monetary Plus and Income lines. This section concluded by asking the participants if they ever attempted to gain information on the *Cometa* investment lines. Finally, Section 4 first presented a simple example of the calculation of real and nominal returns in an environment with 1% annual inflation and annual nominal returns of 3%. A further slide illustrated the nominal and real returns from April 2005 to December 2014 for the Money Market Plus and Income investment lines. Next, diversification was introduced by a question on the relative risk of two simple betting strategies: 1) betting 10 euros on the outcome of a single coin toss and 2) betting one euro on each of 10 coin tosses. The correct answer was then given and used to illustrate the concept of diversification. The final slide of the seminar reiterated the importance of long-term planning. The presentation concluded with a question on the intention to make changes in social security options following the seminar.

4.1.1. Discussion

The design of this program is worth some discussion on the economic channels through which the online financial and demographic literacy seminar can affect participants' behaviors, as well as the related policy implications.[4] This seminar can be effective either directly or indirectly. The direct effect is realized when the participants translate what they have learned into active choices following the seminar, while the indirect effect occurs when the seminar merely increases the participants' interest in personal finance, by making them more aware that various complex assessments and choices can determine their financial well-being.

Overall, our seminar not only illustrates basic and relevant concepts in demographics, finance, and economics for optimal retirement savings, but it also "nudges" the participants toward acquiring more information on the alternative investment lines available through *Cometa*. In other words, the potential effects in terms of gathering more information from the *Cometa* website on individual pension positions and opportunities are directly related to the

[4] We are grateful to the anonymous referee for raising this point.

program. The program's construction also differentiates it from a generic intervention that can intrigue workers and make them think about their finances, such as a funny *TikTok* video in which an influencer tells workers that they should plan their finances. Moreover, our experimental design (described in the next section) allows us to estimate the causal effects of the program on the participants' behaviors and choices.

4.2. Experimental design

In order to test the effectiveness of this program, we adopted a randomized experimental design that included a *treatment* group and a *control* group. As for the former group, we presented the online seminar first and the questionnaire after, while for the latter group, we administered the questionnaire first and the online seminar after. All of the analyses were conducted by preserving full anonymity of the respondents, while being able (through individual codes) to reconstruct their key characteristics such as gender, occupation type (factory vs. office worker), age, education, and financial choices. The *treatment* and *control* groups were generated by the following procedure.

1) *Cometa* allowed us to contact up to 28,000 individuals among the approximately 140,000 (out of the total of 408,797) members who had given their e-mail addresses to the pension fund in order to receive periodic reports and communications.
2) After excluding goldsmiths (to ensure greater homogeneity), we applied a stratified sampling approach, based on the information from the *Cometa* database, along four dimensions. Specifically, we stratified between factory and office workers, between gender (women accounted for less than 20% of the total number of members), between age brackets (20–39 years; 40–59 years; 60 years and more), and between macro-regions of birth. We allocated our maximum target of 28,000 individuals to each cluster based on these four dimensions, and then within each cluster, we randomly selected the individuals to be assigned to the *treatment* group and the *control* group. The treatment group was given access to the post-seminar questionnaires only after completion of the online seminar.
3) The individuals randomly assigned to the *treatment* group and the *control* group received an identical e-mail from the pension fund inviting them to participate in the financial education program. Those in the *treatment* group could access the online seminar by clicking on a member-specific link, which allowed us to record individual access to the seminar. The participants' attention was monitored by posing questions at regular intervals during the seminar. Then, two weeks after the seminar, the

treatment group was asked to complete a questionnaire about demographic and financial literacy, and about their behavior in terms of acquiring more information for pension planning over the last two weeks.

4) By clicking on the link in the invitation e-mail, the individuals in the *control* group had direct access to the same questionnaire as those in the *treatment* group. The opportunity to view the online seminar was only offered after completing the questionnaire.
5) Invitations with links to either the online seminar or the questionnaires were sent between June 2015 and early March 2016. Our initial dataset comprised all of the completed questionnaires (as of April 15, 2016). The final sample included 1,436 completed questionnaires, of which 770 were from the *treatment* group and 666 were from the *control* group.

Moreover, between July and September 2016, six of the demographic and financial literacy questions were re-submitted in a second online questionnaire to those who completed the online seminar and the first questionnaire. The median time interval between the first invitation to attend the online seminar and the second questionnaire was 8.6 months, with 90% of the observations between four and 12.6 months.

4.3. Outcomes: The questionnaire

The main questionnaire (see Boxes 1–2) consisted of two blocks, covering demographic and financial literacy, as well as attitudes and behavior. Additionally, three demographic questions were asked on life expectancy at 60 years, its evolution over time, and the relationship between an increase in life expectancy at 60 years and the expected pension payments. Then, nine financial literacy questions were asked, reflecting the format of the basic and advanced literacy questions from Van Rooij et al. (2011). In particular, we used questions on numeracy, inflation, interest compounding, the risk-return profile for savings accounts, stocks and bonds over long horizons, the relationship between expected returns and risk, and the effects of diversification.

The second section of the questionnaire (see Box 2) investigated the respondents' attitudes and behavior. Specifically, the respondents were asked whether (over the past two weeks) they had searched for information on savings and pensions, discussed savings and pensions with their family members or colleagues, attempted to estimate their expected pension using

the *Cometa* website or reading the *Cometa* annual report, and searched for information on the characteristics of the different *Cometa* investment lines.

Box 1: Demographic and financial literacy questions

a1. *Life expectancy:* **In Italy today, a man who is 60 years old can expect to live until** (1) 79 years or more, (2) between 76 and 78 years, (3) between 73 and 75 years, (4) 72 years or less, or (5) Do not know.

a2. *Evolution of life expectancy:* **A man/woman who is 60 years old in Italy has a life expectancy that is** (1) At least two years less than a 60-year-old person that lived 20 years ago, (2) Between 1 and 2 years less than a 60-year-old person that lived 20 years ago, (3) Approximately the same as a 60-year-old person that lived 20 years ago, (4) Between 1 and 2 years more than a 60-year-old person that lived 20 years ago, (5) At least two years more than a 60-year-old person that lived 20 years ago, or (6) Do not know.

a3. *Life expectancy and pension:* **Given the constant contributions for retirement, what is the effect of an increase in life expectancy at retirement on the expected public monthly pension payments?** (1) If life expectancy increases, then the monthly pension payment increases, (2) If life expectancy increases, then the monthly pension payment decreases, and (3) The monthly pension remains the same, since, given the current law, it is independent from life expectancy, or (4) Do not know.

a4. *Numeracy*: **Suppose you have €100 in a savings account and the interest rate is fixed at 2% per year. After 5 years, how much do you think you would have in the account, in the absence of withdrawals?** (1) More than €102, (2) Exactly €102, (3) Less than €102, or (4) Do not know.

a5. *Inflation*: **Imagine that the interest rate on your savings account is 1% per year and inflation is 2% per year. After 1 year, how much would you be able to buy with the money in this account?** (1) More than today, (2) Exactly the same, (3) Less than today, or (4) Do not know.

a6. *Interest compounding -:* **Suppose you have €100 in a savings account and the interest rate is 20% per year. After 5 years, how much would you have on this account, in the absence of withdrawals?**

(1) More than €200, (2) Exactly €200, (3) Less than €200, or (4) Do not know.

a7. *Expected return ranking:* **Which of the following assets has historically provided the highest returns over a long holding period (from 10 years onwards)?** (1) Saving accounts, (2) Stocks, (3) Bonds, or (4) Do not know.

a8. *Risk ranking:* **Which of the following assets has historically displayed the highest fluctuations over time?** (1) Saving accounts, (2) Stocks, (3) Bonds, or (4) Do not know.

a9. *Risk-return relationship:* **An investment with a high expected return is more likely to have a high risk: True or false?** (1) True, (2) False, or (3) Do not know

a10. *Diversification 1:* **If you invest €1000 in stocks, then is it riskier to invest €1000 in only one stock or €100 in 10 different stocks?** (1) It is riskier to invest €100 in only one stock, (2) It is riskier to invest €100 in 10 different stocks, or (3) Do not know.

a11. *Diversification 2:* **When an investor diversifies his/her investment among different assets, does the risk of making a loss:** (1) Increase, (2) Stay the same, (3) Decrease, or (4) Do not know.

Box 2: Questions on Behavior

b1. **Over the last two weeks, I searched for information on savings and pensions**: (1) Yes or (2) No.

b2. **Over the last two weeks, I discussed savings and pensions with my family members**: (1) Yes or (2) No.

b3. **Over the last two weeks, I discussed savings and pensions with my colleagues**: (1) Yes or (2) No.

b4. **Over the last two weeks, I attempted to estimate my expected future pension through the *Cometa* website or by reading the annual personal report from *Cometa***: (1) Yes or (2) No.

b5. **Over the last two weeks, I searched for information about the investment lines of the *Cometa* fund**: (1) Yes or (2) No.

4.4. Outcomes: financial choices

In this study, information on the participants' financial choices was gathered from *Cometa*. Specifically, we collected the data on the changes in the investment lines within the first year after the online seminar. Since the members of the *control* group were given access to the

online seminar after completing the questionnaire, we had to define a different set of variables for this outcome.

For this purpose, we defined a broader *treatment* group: T2, as the sum of the original *treatment* group (T1) and the members of the original *control* group who accessed the seminar after completing the questionnaire. We then used an exact matching strategy (Abadie and Imbens 2006; Stuart 2010), in which each member of T2 was matched to two individuals in the fund who were not involved in the experiment. This matching procedure resulted in trios of one *treatment* (T2) unit and two *control* units (C2). The individuals in each trio had the same age, gender, job qualification (blue vs. white collar), level of education, and initial investment line (Money Market Plus, Safety, Income, or Growth). The matched individuals were only allowed to serve as a match once, and in case of multiple exact matching, the individual with an enrollment number closer to that of the individual in the *treatment* group was chosen. Overall, 923 perfectly matched trios were obtained, out of the 1,140 individuals assigned to group T2 (i.e., 770 participants were assigned to T1 and 370 participants were assigned to T2, but not to T1).

5. Results: (a) The program's effect on literacy, attitudes, and self-reported behavior

5.1. Descriptive statistics

Our sample for the main experiment consisted of 1,436 individuals (770 in the *treatment* group and 666 in the *control* group). In order to evaluate the randomization of the experiment, we considered the mean values of the individual characteristics for the total population and for the two groups, together with a test on the significance of their differences (see Table 2). We also considered age, gender, place of birth, and education, along with variables describing the participants' choices regarding their contributions to the different investment lines made available by *Cometa*. Moreover, we considered the years of voluntary contributions, the choice of investment lines, the choice of making additional deposits, and the option of requesting anticipated advances.

Overall, the evidence did not lead to the rejection of the null hypothesis of randomization, although there were some exceptions. In particular, the share of blue-collar workers was higher in the *control* group, while the share of individuals with a university degree was higher in the *treatment* group. Some evidence also indicated that the members of the *control* group tilted their choice in favor of safer and lower return strategies. Based on these results, the following regression analyses include controls for all of the relevant characteristics.

[Insert Table 2 about here]

5.2. Regression analysis of the program's effect

In order to examine the significance of the program's effect, we considered a difference estimator within a system of linear probability equations. Given the availability of 1,436 answers to 16 questions, our evidence was based on the estimation of the following system of linear probability models:

$$Y_i^1 = \beta_0^1 + \beta_1^1 X_i + \Sigma_{j=1}^{23} \beta_{j+1}^1 W_i + u_i^1$$
$$Y_i^2 = \beta_0^2 + \beta_1^2 X_i + \Sigma_{j=1}^{23} \beta_{j+1}^2 W_i + u_i^2$$

…

$$Y_i^{16} = \beta_0^{16} + \beta_1^{16} X_i + \Sigma_{j=1}^{23} \beta_{j+1}^{16} W_i + u_i^{16}$$

where Y_i^k represents the binary variables that capture the correct answer to the k-th question in the survey, X_i is a dummy for identifying the *treatment* group, and W_i refers to the controls for the 23 characteristics presented in Table 2.

We did not impose any restrictions, allowing both the average probability of giving correct answers for the *control* group and the program's effect to be different in each question. Since all of the controls with a non-dummy nature were demeaned, the constant in each equation can also be interpreted as the average probability of giving correct answers for the *control* group.

The first group of questions measured the effect of the program on demographic knowledge, the second group of questions focused on financial knowledge, and the third group of questions examined the participants' attitudes and behavior. As for the linear probability model, it was estimated at the cost of losing the possibility of approximating the non-linear population regression function. In practice, the relevance of this potential cost depends on the number of extreme values in the regressors. We checked the robustness of the results based on the linear probability model by considering an alternative *logit* specification, which confirmed the baseline evidence.

In addition, the system was estimated by an equation by equation limited information methods using Huber-White robust standard errors (see White 1980). Our treatment has many dimensions, and each equation in the system measured the effect of a specific

dimension on a specific outcome. Thus, the issue of multiple hypotheses testing, which emerges when the effect of a single treatment is tested on many outcomes or when the effect of multiple treatments is tested on a single outcome (see List et al. 2019), should be of limited relevance. However, in order to consider the potential correlation of the residuals across the different equations, we assessed the robustness of our results by using the seemingly unrelated regression estimation method.[5]

Based on the results in Table 3, the statistical evidence for the program's effect was uniform across all of the questions, with only three exceptions: two questions on the participants' attitudes and behavior (i.e., Question b2, which asked if the subject had discussed savings and pensions with family members over the last two weeks, and Question b3, which asked if the subject had discussed savings and pensions with colleagues); and one question on diversification, in which the average probability of giving correct answers for the *control* group was as high as .95.

Interestingly, the treatment's effect was not the same across the different questions and it had a greater effect in the three questions related to basic financial literacy and in the question related to the effect of an increase in life expectancy on monthly pensions. Regarding the maximum impact of the treatment, there was an increase of .21 in the probability of searching for more information on the different investment lines of the *Cometa* fund. Since the significance of the controls broadly reflected the patterns in the data based on descriptive statistics, we analyzed the results in more detail by disaggregating different sections of the questionnaire.

[Insert Table 3 about here]

5.2.1. Demographic literacy and pension payments (Questions 1–3)

The first two questions of our survey evaluated the knowledge of expected residual life at 60 years and its evolution over the last 20 years, while the third question investigated the awareness of the relationship between life expectancy at 60 years and the expected pension payments. In the first two questions, the average probability of giving correct answers for the

[5] To generate heterogeneity in the specification of the different equations, only significant controls were included in all of the equations. The results from the SURE estimation are available in the replication package associated with this study.

control group was .58 and .73, respectively. In this case, this probability was affected by the controls and the treatment, significantly increasing it by .056 and .078, respectively. In the third question, the average probability of giving correct answers for the *control* group was .30. In this case, the treatment increased it by .173, while the presence of a university degree increased it by .217. Interestingly, the null hypothesis that the effect of the treatment is not significantly different from that of a university degree cannot be rejected.

5.2.2. Financial Literacy: interest compounding, inflation, risk, returns, and diversification (Questions 4–11)

Questions 4–6 were designed to assess basic financial literacy concerning interest compounding and nominal vs. real interest rates. In all of these questions, we used similar wording to that in the Health and Retirement Study by Lusardi and Mitchell (2007). In addition, Questions 7 and 8 assessed the knowledge of the first two moments of the distribution of returns on stock, bonds and saving accounts, Question 9 concentrated on the risk-return relationship, and Questions 10 and 11 focused on diversification and its impact on risk.

Our evidence shows that the level of financial literacy in our sample was generally higher than that of the Survey on Household Income and Wealth (SHIW) conducted by the Bank of Italy[6] (see Fornero and Monticone 2011), and that the online seminar uniformly increased the probability of giving correct answers. The only financial question in which the average probability of giving correct answers for the *control* group was lower than 50% was that on the long-term returns from investing in shares. A comparison of our data with that of the SHIW suggests that the 2008 global financial crisis increased public interest in basic financial concepts, but it has also generated a pessimistic view of stock market returns.

We also found statistical evidence of a gender gap, with a monotonically increasing relationship between the level of education and financial literacy, as well as significant regional disparities between the northern and southern regions of Italy. Specifically, in Questions 4–6 (which assessed basic financial literacy concerning interest compounding and

[6] Every two years, through the Survey on Household Income and Wealth (SHIW), the Bank of Italy collects detailed data on household demographics, consumption, income, and wealth for a representative sample of the Italian population. See http://www.bancaditalia.it/statistiche/tematiche/indagini-famiglie-imprese/bilanci-famiglie/documentazione/index.html.

nominal vs. real interest rates), the average probability of giving correct answers for the *control* group was .7. In this case, the program increased this probability by .11, while the presence of a university degree increased it by .12. Again, the null hypothesis that the treatment's effect is not significantly different from that of a university degree cannot be rejected. Meanwhile, the treatment's effect was particularly strong in Question 6, which focused on interest compounding. Specifically, the low awareness of compounding might have caused the younger individuals to underestimate the risk that an investment strategy based on low-risk-low-return, long-term investments can generate insufficient payments during retirement.

Questions 7–11 assessed the level of financial literacy regarding expected returns and risk. Here the estimates for Question 7, which focused on the expected returns, greatly differed from those for the other three questions that concentrated on risk. The average probability of giving correct answers for the *control* group was slightly above .5, which was raised by .2 by the treatment. As for the answers on the risks of different types of investments, they produced a much higher average probability of giving correct answers for the *control* group, i.e., slightly above .85. Here, the program's effect was still significant (albeit small), with an average marginal effect of .03. In Question 10 (which focused on the impact of diversification on risks), the treatment's effect was not significant, where the average probability of giving correct answers for the *control* group stood at .95. Meanwhile, the location dummy had a significant effect. For example, the respondents from southern Italy had a lower probability of correctly assessing risk, with a reduction in the average probability of giving correct answers for the *control* group that ranged from –.05 to –.08, always significantly different from zero.

5.2.3. Attitudes and behavior (Questions 12–16)

Questions 12–16 concentrated on the participants' attitudes and behavior, with reference to the two weeks following the seminar. In particular, this section assessed the general interest in savings and pensions (Question 12), the frequency of discussions on savings and pensions with family members (Question 13), the frequency of such discussions with colleagues (Question 14), whether the respondents attempted to estimate their future pensions through the *Cometa* website or the *Cometa* annual individual report (Question 15), and whether the respondents searched for information on the different investment lines offered by the *Cometa* fund (Question 16).

The answers revealed that the program did not "nudge" the individuals to discuss pensions with their family members or with their colleagues, but it significantly inspired them to search for more information on pensions in general, on the forecast of future pension payments, and on the differences between the available investment lines. The remarkable effect of the program in "nudging" the individuals to search for information about the four different investment lines (the average probability for the *treatment* group increased by 0.221 from a level of 0.131) in the two weeks after the online seminar is notable, considering the tendency of many workers to remain with the default investment line. This (non-)choice most likely hides their unwillingness to gather information or the inability to make a conscious decision.

5.3. Does the program's effect depend on individual characteristics?

The baseline results in the previous section provide confirmatory evidence of financial literacy in Italy and new evidence on the statistical impact of the online seminar on financial and demographic literacy. In particular, we found statistical evidence of a gender gap, a monotonically increasing relationship between the level of education and financial/demographic literacy, significant regional disparities between the northern and southern parts of the country, and a uniformly significant coefficient on the treatment for nearly all of the survey questions. In light of this evidence, it is worth assessing whether the treatment's effects are related to a heterogeneous initial level of literacy. Hence, we augmented our initial specification with the interaction between the treatment and the individual dummies.

Tables 4a and 4b report the results of estimating the extended linear probability model. Our evidence strongly indicates that the treatment's effect was not influenced by the individual characteristics that generate heterogeneity in financial literacy. The interaction between treatment and the dummies that captures heterogeneity due to gender, education, and geographical location was not significantly different from zero. Moreover, if we consider the four cases in which an interaction was significant at the 5% level (e.g., university degree in Questions 1 and 6, South in Question 8, and white collar in Question 9), then the effect moves in the direction of *reducing* rather than increasing the literacy gap among the sub-groups with different ex-ante levels of literacy. The only exception was the larger effect of the treatment for university degree holders who searched for more information on the different investment lines of the fund. This result echoes recent findings in which cognitive abilities can make individuals more prone to understanding incentives and more receptive to

information when planning their economic decisions (see D'Acunto et al. 2022). However, the treatment's effect remained significant in this case.

Overall, "nudging" seemed to uniformly work for the individuals with heterogeneous characteristics and those with heterogeneous pre-treatment levels of financial literacy. The program's provision of relevant information dominated the second-order effect of making more educated individuals interested in finance. This evidence has relevant policy implications for future financial literacy programs and how such programs can close the knowledge gap and reduce wealth inequalities.

[Insert Tables 4a and 4b about here]

5.4. Does the treatment effect last over time?

In order to assess the lasting effect of our "nudging" experiment, we exploited the evidence from a second questionnaire (administered online approximately nine months after the first questionnaire) to those who completed the online seminar and the first questionnaire. The second questionnaire focused on a subset of questions, i.e., six of the demographic and financial literacy questions (Question a2, change in life expectancy; Question a3, life expectancy and pensions; Question a4, numeracy; Question a5, inflation; Question a6, compounding interest; and Question a10, diversification). We also re-ran our model with interactions by using as *treatment* group the respondents to the second questionnaire (results of which are shown in Table 5).

The evidence rejects the null hypothesis of a temporary effect of the "nudging" experiment. Moreover, for five of the six questions, the impact of the treatment was statistically significant, with the only exception being the question on life expectancy. In sum, the long-term effect of the treatment was more uniform than the short-term impact.

We also checked whether the distance between the invitation to participate in the video and the completion of the second questionnaire impacted the probability of correctly answering. The distance was never statistically significant when the treatment was.

[Insert Table 5 about here]

5.5. Robustness checks

A potential threat to the internal validity of the results was attrition, which could have caused an overestimation of the treatment's effect. Specifically, the participants in the *treatment* group, who attended the entire seminar before accessing the questionnaire, might have had stronger motivation than those in the *control* group (who immediately accessed the questionnaire) and would have found it easier to complete the task. Since the difference in motivation and engagement could justify the positive difference in the probability of giving correct answers between the *treatment* and *control* groups, it deserves further attention.
In order to address this potential problem, we exploited the fact that the *control* group was invited to attend the seminar after completing the questionnaire. In this case, 370 participants out of the 666 (i.e., 56%) seized the opportunity. Thus, we repeated the analysis by comparing the 770 treated units to the 370 individuals from the *control* group who attended the seminar after completing the questionnaire. The evidence (reported in the Online Appendix) indicates that the results of the original sample are robust.

6. Results: (b) Treatment effect on actual financial choices

In this study, we also measured the treatment's effect on actual investment and savings decisions. The outcome of interest was the probability of changing the investment line within three months after completing the online seminar. As described earlier in Section 3.4, we adopted an exact matching strategy for the *treatment* and *control* groups, whereby each individual who attended the seminar was matched with two comparable fund members who were not involved in the experiment. We obtained a total of 923 matched trios. When considering the potential change in the investment line within three months after completing the seminar, we examined the same time interval for the *control* units and the matched *treatment* unit.
We chose a relatively narrow time interval to observe the behavioral response driven by the treatment. However, the results were robust when a 12-month time interval was considered. Here, we first present some descriptive evidence (in the form of a transition matrix) and then estimate a linear probability model that exploits the variations within the trios. The baseline model is the follows:

$$Y_i = \beta_0 + \sum_{j=1}^{4} \beta_j C_{ij} X_i + \underline{\beta}_5' \underline{w} + \underline{\beta}_6' \underline{X}_i' \underline{w} + FE(Triplet_i) + u_i$$

where Y_i is the probability of changing the investment line within three months, C_{ij} takes a value of 1 if individual i was originally in investment line j, X_i is the dummy for the program, and $\underline{w}$ is the vector of the demeaned controls.

The transition matrix is described in Table 6.

By looking at the aggregate matrix, the average probability of switching investment lines was less than 0.01 for those who had chosen one of the three investment lines with the highest risk-return profiles. Meanwhile, the average probability was 0.036 for those originally assigned to the safest investment line (i.e., Money Market Plus, the default choice until February 2017). Focusing on the participants enrolled therein, the average probability was as low as 0.006 in the *control* group, whereas it was as high as 0.096 for the *treatment* units. In addition, approximately 60% of the participants who changed investment lines opted for Income (with a medium-high level of risk-return), 30% selected Growth (with the highest level of risk-return), and the remaining 10% opted for Safety (with a moderate level of risk-return). As for the other investment lines, there were virtually no changes to safer investment profiles. Overall, the descriptive analysis suggests that the program stimulated the participants to reconsider their investment decisions, including "nudging" the members in the default line to select a more suitable profile.

[Insert Table 6 about here]

Table 7 presents the estimates of the linear probability model. The regressors included in the baseline model (shown in Column 1) are the interactions between the *treatment* group (T2) and the investment line, and the controls for job qualification, gender, age (demeaned), level of education, macro-region of birth, and investment line. The estimated effects indicate that the average probability that the *treatment* group (initially enrolled in the default investment line) changed to another investment line was 0.094 higher than that for the matched *control* units. This coefficient was significant at the 1% level and consistent with the previously discussed evidence from the transition matrix. Moreover, the treatment's effect for the participants initially enrolled in Income was 0.0118 (significant at the 10% level), whereas no significant effect was found for Safety and Growth.

In Column 2, we determined if there was a quadratic relationship between age and the dependent variable, by adding the square of the demeaned age among the regressors. Since this term was not significant and the other coefficients were unaffected, we maintained the hypothesis of the linear effect of age.

In Column 3, we added an interaction term between treatment and age (demeaned) in order to test whether the treatment produced different behaviors across age categories. In this case, the interaction *Treatment*Age* was not significant, while the coefficient for *Treated*Money Market Plus* was .086 and the one for *Treated*Income* was .0135.

In Column 4, we included the interaction between the treatment and the controls (i.e., demeaned age, gender, job qualification, level of education, and macro-region of birth) in order to test for the differences in the treatment's effectiveness across population sub-groups. Based on the findings, the interaction terms were not statistically significant and the treatment's effect on the participants in the Income investment line lost significance, whereas the treatment's effect on the units in the default line was 0.0746 (significant at the 1% level).

In Column 5, we included additional controls related to previous investment decisions, i.e., dummy variables for voluntary extra contributions to the fund, years of contribution (demeaned), and the number of early withdrawals (demeaned). Again, the only significant effect was that of the treatment on the participants in the default investment line, which was .0749. While this evidence suggests strong significance of such an effect, the lack of significance for the other interactions might be due to the relatively small sample size, or the absence of an effect on the participants who had already chosen more complex investment profiles.

In Column 6, we tested for heterogeneity in the treatment's effects by age for those originally enrolled in the default line. Both *Treatment*Money Market Plus* and the three-way interaction were significant at the conventional confidence level, and the effect was substantial. Specifically, the probability of switching to a riskier investment profile for an individual with an average age of 44.4 years (in our sample) was 0.0636, and it decreased by 0.00342 for every additional year of age. Moreover, the probability was close to 0.113 for a 30-year-old, and it dropped to approximately 0.01 for a 60-year-old. This finding is particularly interesting, in that only the younger participants (who have a longer investment horizon) preferred investments with higher volatility and returns. It also indicates that it is possible to have a material impact on younger workers' behaviors, with potentially large effects on their well-being after retirement.

Column 7 presents the same model, but with additional controls for previous investment decisions. The coefficients were significant for the participants originally enrolled in Money Market Plus. In this regard, the effect at mean age was estimated at 0.064, while the three-way interaction showed a decline of 0.00338 per year of age.

[Insert Table 7 about here]

As a robustness check, we repeated the analysis by considering the probability of switching investment lines within 12 months after completing the online seminar. The results (shown in Table 8) are similar to those previously obtained. Specifically, the average probability of switching investment lines was 0.116 for individuals originally enrolled in Money Market Plus, while it was 0.016 for those enrolled in Income. When the interaction terms between treatment and controls were added, the interaction *Treated*Money Market Plus* was significant, at 0.091, and it was significantly stronger for individuals with a high school degree and those born outside of Italy. Finally, the interaction between the treatment and enrollment in the default line, and treatment and demeaned age yielded an effect of 0.0758 (for an individual of average age), with a 0.0048 decline for every additional year of age. For ease of interpretation, the estimated effect was 0.145 for a 30-year-old and 0.001 for a 60-year-old.

[Insert Table 8 about here]

In order to address the potential concerns related to attrition, we conducted an intention-to-treat analysis. In this case, we used the full database of the pension fund members who had given their e-mail addresses in order to evaluate the effects of the e-mail invitation to participate. The following specification was adopted:

$$Y_i = \beta_0 + \beta_1 X + \underline{\beta_2}\ \underline{w} + u_i$$

where X is equal to 1 for the participants that were invited by e-mail to be in the experiment, and $\underline{w}$ is the vector of controls. Meanwhile, the key elements used earlier to form the trios (i.e., gender, blue/white collar, education, area of birth, investment line, and age in deviation) were considered in factorial format, i.e., considering all of the possible interactions.
Y is equal to 1 if the individual has switched his or her investment line within three months from having access to the online seminar (at least potentially, since many individuals were simply invited but did not participate).[7]

[7] In those case where some individuals in the same clusters did not receive the invitation (invitations were sent in different rounds between June 2015 and March 2016 for different clusters of gender/occupation/macro-region of birth/age bucket), we considered the same date of invitation to the other individuals in the cluster. In those cases when larger clusters (e.g., male blue collars born in Northern Italy and aged between 21 and 40) were split among multiple dates, we randomly extracted for non-treated individuals a date among those used for invited individuals.

Finally, Table 9 reports the results of 1,000 and 2,000 simulations based on different simulated dates for the non-invited individuals. When considering the 2,000 simulations, the coefficient β_1 associated with the invitation to participate in the treatmentwas significant at the 10% level for 91% of the simulations and at the 5% level for 60% of the simulations. Moreover, the mean beta was 0.109, which (compared to the mean constant of 0.154) indicated an increase of more than 70% in the probability of changing the investment line within three months after receiving the invitation. These results, combined with the fact that no pre-selection of potential participants was made, confirm the strength of this low-cost intervention on the population of pension fund participants.

[Insert Table 9 about here]

6.1. Discussion

Overall, the results in this section show that those who were exposed to the online financial literacy treatment were more likely to gather additional information about the alternative investment lines available from *Cometa*, change from the default option, and make more active choices regarding their finances.

Although there has been some evidence on the strong role of inertia in retirement savings choices in the United States, as well as on the powerful role of default options (Madrian and Shea 2001), the literature has yet to provide an answer on the relative importance of two alternative explanations. Specifically, inertia can be mostly due to an individual's deliberate avoidance of making important financial decisions (i.e., the "Ostrich effect" discussed by Galai and Sade 2006) or the fact that some people are simply unaware that they must make financial choices because they fail to read the letters/e-mails from their employers regarding retirement funds. Our experiment shows that "nudging" individuals can make them more aware of their financial options and effectively induce them to make the related choices.

7. Conclusions

This study examined the effects of an online financial education program for workers, called Financial Education and Planning for a Long Life (*Finlife*). The potential of this program is evident if we consider that even among the pension fund members, the percentage of individuals who invested in an investment line with more than 15% of stocks was below 4%

at the end of 2014, and that only a small percentage had shown a clear understanding of the increase in longevity risk generated by the recent pension reforms in Italy.

Our experimental design also provided evidence that *Finlife* can produce a statistically significant, homogenous, and persistent increase in financial and demographic literacy, a stronger interest for estimating individual pension positions, and modifications in actual behavior, measured by opting for different investment lines within the fund. We also found a significant effect on the migration of workers toward higher-risk, higher-return investment lines. This effect was larger for younger workers, precisely those for whom a very low risk-very low return asset allocation would be the most detrimental over the long term.

Using data on actual performance of *Cometa* investment lines, it was possible to estimate the impact on retirement wealth of switching assets over a five-year horizon, by comparing the value of the Money Market Plus with that of the Income line between December 2016 (after the end of the last online seminar) and December 2021. During this period, the EUR 100 invested in Money Market Plus delivered a final capital of 99.75, with a slightly negative nominal return. Conversely, the same amount invested in the Income line delivered a final capital of EUR 111.88. Even if our experiment occurred before the "great acceleration" in digitalization caused by the COVID-19 pandemic (Amankwah-Amoah et al. 2021), it indicates that online seminars can have a significant impact on financial decisions.

Overall, our results contribute to the literature in four specific dimensions. First, the seminar highlighted the importance of identifying relevant information and the specific sources to find such information. Its construction also differs from a generic intervention that intrigues workers and makes them think about their finances. The potential effect of gathering more information on individual pension positions and investment lines from the *Cometa* website was also directly related to the treatment.

Second, the general effect of the program in providing information that transmitted into decision-makers' choices dominated the second-order effect of making more educated individuals more interested in finance. This evidence supports the potential of financial literacy programs for closing the existing knowledge gap and reducing wealth inequalities.

Third, informing individuals and making them aware of their investment options can limit the relevance of the "Ostrich effect" in finance.

Finally, our evidence gives survival literacy a central role in the discussions on long-term financial planning, which is particularly relevant in contexts characterized by aging population. Survival literacy, and more generally demographic literacy, might also contribute to a more effective financial literacy program, since it directly draws the attention of

individuals on more visible issues (e.g., How long will I live after retirement?), thus making their economic and financial consequences more salient.

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Table 1. Investment lines of the *Cometa* pension fund

Name of the investment line	Money Market Plus	Safety	Income	Growth
Investment profile	100% short-term bonds; 0% stocks	Minimum guaranteed return; maximum 10% of stocks	85% bonds 15% stocks	60% bonds 40% stocks
Number of members (end of 2014)	173,634 (42.5%)	58,057 (14.2%)	160,832 (39.3%)	16,274 (4.0%)

Source: *Cometa*.

Table 2. Descriptive statistics

Sample size: **1436**, *Treatment* group size: **770**, *Control* group size: **666**.

Characteristic		Sample	Control	Treated	Difference	P-Value[1]
Age		44.48	43.84	45.03	–1.19**	0.0103
Occupation	% of "Blue Collars"	40.04%	45.95%	34.94%	11.01%***	0.0000
Gender	% of males	70.68%	69.52%	71.69%	–2.17%	0.3683
Place of birth	Northern Italy	51.18%	50.30%	51.95%	–1.65%	0.5337
	Central Italy	23.54%	22.82%	24.16%	–1.33%	0.5530
	Southern Italy and Islands	20.68%	21.62%	19.87%	1.75%	0.4142
	Abroad	4.60%	5.26%	4.03%	1.23%	0.2676
Educational Qualification	University Degree	23.33%	20.12%	26.10%	–5.98%***	0.0075
	High School	52.92%	52.55%	53.25%	–0.69%	0.7929
	Compulsory Education	20.19%	23.42%	17.40%	6.02%***	0.0046
	No School	3.55%	3.90%	3.25%	0.65%	0.5026
Years of Paid Contributions		12.62	12.39	12.82	–0.43*	0.0760
Investment line	"Monetario Plus" (Money Market Plus)	20.68%	25.23%	16.75%	8.47%***	0.0001
	"Reddito" (Income)	48.47%	45.95%	50.65%	–4.7%*	0.0754
	"Sicurezza" (Safety)	14.28%	14.86%	13.77%	1.09%	0.5532
	"Crescita" (Growth)	16.57%	13.96%	18.83%	–4.87%**	0.0134
Extra individual contributions to the fund	No	97.21%	97.00%	97.40%	–0.40%	0.6416
	Occasional extra contributions	2.72%	2.85%	2.60%	0.25%	0.7667
	Regular extra contributions	0.07%	0.15%	0%	0.15%	0.2824
Anticipations (early partial withdrawals)	Total Anticipations	0.39	0.43	0.36	0.07	0.1275
	Anticipations for purchase of the first house	0.06	0.06	0.06	0	0.9527
	Anticipation for restoring the first house	0.02	0.02	0.01	0.01	0.2612
	Anticipations for serious sanitary expenses	0.02	0.03	0.02	0.01	0.4271
	Anticipations for other reasons	0.29	0.32	0.26	0.06	0.1493

1: Two-sample t-tests with equal variances.
* indicates that the difference is significant at a 10% level of confidence.
** indicates that the difference is significant at a 5% level of confidence.
*** indicates that the difference is significant at a 1% level of confidence.

Table 3. Linear probability baseline model: The first questionnaire

VARIABLES	a1 Life Exp.(LE)	a2 Changes in LE	a3 LE and Pens.	a4 Numeracy	a5 Inflation	a6 Int. Comp.	a7 Expected Returns	a8 Risk	a9 Risk-Return	a10 Diversifi-cation	a11 Diversifi-cation	b1 Info on S.S.	b2 Disc. Fam.	b3 Disc. at Work	b4 Est. of pension	b5 Info on Lines
Constant	0.582**	0.729**	0.300**	0.733**	0.807**	0.531**	0.510**	0.886**	0.930**	0.952**	0.783**	0.346**	0.514**	0.582**	0.208**	0.139**
	(0.049)	(0.042)	(0.047)	(0.039)	(0.034)	(0.047)	(0.048)	(0.027)	(0.027)	(0.021)	(0.035)	(0.049)	(0.050)	(0.050)	(0.046)	(0.044)
Treated	0.056**	0.078**	0.173**	0.119**	0.052**	0.174**	0.196**	0.034**	0.054**	0.015	0.057**	0.121**	−0.012	−0.036	0.169**	0.221**
	(0.026)	(0.022)	(0.026)	(0.020)	(0.016)	(0.024)	(0.025)	(0.013)	(0.013)	(0.012)	(0.017)	(0.026)	(0.027)	(0.026)	(0.024)	(0.024)
Female	0.035	0.010	−0.036	−0.041*	−0.040*	−0.126*	−0.024	−0.021	−0.054*	−0.013	−0.023	−0.032	0.038	−0.086*	−0.036	−0.047
	(0.029)	(0.024)	(0.028)	(0.023)	(0.019)	(0.028)	(0.028)	(0.015)	(0.016)	(0.013)	(0.019)	(0.029)	(0.030)	(0.030)	(0.026)	(0.026)
White collar	0.056*	0.052*	0.023	0.058**	0.063**	0.158**	0.001	0.055**	0.032*	0.013	0.053**	0.027	−0.000	0.025	0.029	0.004
	(0.032)	(0.027)	(0.032)	(0.024)	(0.021)	(0.030)	(0.031)	(0.016)	(0.016)	(0.013)	(0.021)	(0.033)	(0.033)	(0.033)	(0.030)	(0.030)
Age dev.	0.025	0.032**	−0.002	−0.041*	0.032**	0.026	0.000	−0.011	0.009	0.012	0.022**	0.058**	0.034*	0.045**	0.015	−0.016
	(0.018)	(0.015)	(0.017)	(0.013)	(0.011)	(0.016)	(0.016)	(0.009)	(0.008)	(0.007)	(0.011)	(0.017)	(0.018)	(0.018)	(0.016)	(0.017)
Age	−0.003	−0.017	−0.009	−0.002	0.006	−0.001	0.006	0.001	0.005	−0.000	0.003	0.033**	0.030**	−0.018	0.028**	0.019
	(0.013)	(0.011)	(0.012)	(0.009)	(0.007)	(0.011)	(0.011)	(0.005)	(0.005)	(0.004)	(0.007)	(0.012)	(0.013)	(0.013)	(0.012)	(0.012)
Univ.degree	−0.025	0.066*	0.217**	0.100**	0.065**	0.127**	0.117**	0.029	0.022	0.045**	0.139**	0.033	−0.069	−0.119*	−0.029	−0.038
	(0.049)	(0.040)	(0.049)	(0.036)	(0.029)	(0.044)	(0.046)	(0.024)	(0.022)	(0.018)	(0.030)	(0.050)	(0.050)	(0.050)	(0.045)	(0.045)
High school	−0.023	0.021	0.074**	0.028	0.005	−0.004	0.002	0.011	−0.027	0.019	0.084**	0.013	−0.028	−0.015	0.030	−0.005
	(0.038)	(0.033)	(0.036)	(0.031)	(0.027)	(0.036)	(0.037)	(0.021)	(0.020)	(0.018)	(0.028)	(0.038)	(0.038)	(0.038)	(0.034)	(0.034)
No school	0.022	0.027	0.095	0.094*	0.047	−0.045	−0.034	−0.017	−0.030	−0.020	0.054	−0.061	0.000	0.008	−0.042	−0.020
	(0.076)	(0.062)	(0.073)	(0.056)	(0.044)	(0.077)	(0.078)	(0.046)	(0.042)	(0.040)	(0.053)	(0.076)	(0.077)	(0.076)	(0.071)	(0.066)
South	0.004	−0.045	−0.043	0.002	−0.041	−0.036	−0.043	−0.060*	−0.056*	−0.046*	−0.084**	−0.004	0.012	0.044	0.008	0.094**
	(0.034)	(0.029)	(0.033)	(0.024)	(0.022)	(0.032)	(0.032)	(0.020)	(0.020)	(0.017)	(0.023)	(0.034)	(0.035)	(0.035)	(0.032)	(0.033)
Observations	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436	1.436
R-squared	0.020	0.035	0.092	0.083	0.089	0.143	0.107	0.054	0.062	0.038	0.112	0.049	0.020	0.044	0.056	0.073

Other control variables are: Dummies for birth in central Italy or outside of the country; dummies for investment lines and voluntary extra contributions; dummies for years of contributions in deviation from their mean, and dummies for the number of early withdrawals in deviation from their mean. The estimation method: Linear probability model. Huber-White robust standard errors are in parentheses below the coefficients. * p < 0.1; ** p < 0.5; *** p < 0.01.

Table 4. Linear probability model with interaction variables: The first questionnaire

VARIABLES	a1 Life Exp.(LE)	a2 Changes in LE	a3 LE and Pens.	a4 Numeracy	a5 Inflation	a6 Int. Comp.	a7 Expected Returns	a8 Risk	a9 Risk-Return	a10 Diversifi-cation	a11 Diversifi-cation	b1 Info on S.S.	b2 Disc. Fam.	b3 Disc. at Work	b4 Est. of pension	b5 Info on Lines
Constant	0.612***	0.725***	0.335***	0.735***	0.800***	0.514***	0.553***	0.897***	0.928***	0.944***	0.774***	0.353***	0.506***	0.623***	0.221***	0.172***
	(0.053)	(0.048)	(0.051)	(0.046)	(0.038)	(0.052)	(0.054)	(0.032)	(0.031)	(0.024)	(0.039)	(0.054)	(0.054)	(0.054)	(0.048)	(0.047)
Treated	0.0003	0.101**	0.116**	0.114***	0.075**	0.201***	0.107**	0.016	0.071**	0.030	0.074**	0.123**	0.013	−0.112**	0.145***	0.164***
	(0.053)	(0.045)	(0.051)	(0.041)	(0.035)	(0.051)	(0.051)	(0.029)	(0.028)	(0.025)	(0.037)	(0.052)	(0.053)	(0.052)	(0.048)	(0.048)
TreatedxFemale	−0.004	0.026	0.068	−0.031	0.026	−0.050	0.034	0.021	0.048	−0.045*	−0.015	0.008	−0.016	0.042	0.023	0.047
	(0.057)	(0.048)	(0.056)	(0.046)	(0.037)	(0.056)	(0.056)	(0.030)	(0.033)	(0.026)	(0.038)	(0.057)	(0.058)	(0.059)	(0.051)	(0.051)
TreatedxWh. Collar	0.053	−0.034	−0.006	0.006	−0.043	0.091	0.098*	−0.012	−0.075**	−0.007	−0.003	0.012	−0.031	0.054	0.043	0.007
	(0.060)	(0.051)	(0.059)	(0.047)	(0.040)	(0.057)	(0.059)	(0.032)	(0.032)	(0.028)	(0.041)	(0.060)	(0.062)	(0.061)	(0.056)	(0.056)
TreatedxAge dev.	−0.004	−0.007***	−0.004	−0.000	−0.003	−0.003	−0.000	0.000	−0.003*	0.002	0.000	−0.014***	−0.005	−0.006**	−0.005	−0.006**
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
TreatedxAgedevSq.	0.001*	0.000	0.001**	0.000	−0.000	−0.000	0.000	0.000	0.000	0.000	−0.000	0.000	0.000	0.000	−0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TreatedxUn. Degree	−0.173**	−0.128**	−0.097	−0.061	0.002	−0.266***	−0.036	−0.050*	0.018	−0.036	−0.066**	−0.050	−0.049	0.061	0.033	0.177***
	(0.070)	(0.055)	(0.070)	(0.047)	(0.034)	(0.059)	(0.065)	(0.028)	(0.030)	(0.022)	(0.033)	(0.070)	(0.072)	(0.070)	(0.063)	(0.061)
Treated x South	0.072	−0.003	0.029	0.014	−0.003	−0.012	0.001	0.072*	0.016	0.005	0.066	−0.021	0.025	0.068	−0.034	−0.044
	(0.065)	(0.055)	(0.063)	(0.047)	(0.043)	(0.060)	(0.062)	(0.038)	(0.040)	(0.033)	(0.045)	(0.064)	(0.066)	(0.066)	(0.060)	(0.062)
Female	0.033	−0.010	−0.077*	−0.026	−0.058*	−0.097**	−0.039	−0.035	−0.085**	0.011	−0.016	−0.044	0.042	−0.112***	−0.048	−0.075**
	(0.043)	(0.038)	(0.040)	(0.037)	(0.030)	(0.042)	(0.043)	(0.025)	(0.028)	(0.019)	(0.031)	(0.041)	(0.043)	(0.043)	(0.034)	(0.033)
White collar	0.023	0.066	0.026	0.052	0.086**	0.102**	−0.049	0.061**	0.072***	0.015	0.053	0.014	0.013	−0.003	0.006	0.004
	(0.046)	(0.041)	(0.043)	(0.039)	(0.034)	(0.045)	(0.045)	(0.024)	(0.028)	(0.022)	(0.034)	(0.045)	(0.046)	(0.046)	(0.040)	(0.040)
Age dev.	0.043*	0.065***	0.016	−0.040**	0.046***	0.037*	0.004	−0.010	0.022*	0.003	0.020	0.124***	0.056**	0.080***	0.039*	0.016
	(0.023)	(0.021)	(0.022)	(0.020)	(0.015)	(0.022)	(0.023)	(0.013)	(0.013)	(0.011)	(0.015)	(0.022)	(0.023)	(0.022)	(0.021)	(0.020)
Age dev.squared	−0.033	−0.028	−0.043**	−0.014	0.009	0.004	−0.013	−0.009	0.002	−0.006	0.009	0.032*	0.029	−0.021	0.033**	0.012
	(0.020)	(0.018)	(0.018)	(0.017)	(0.012)	(0.019)	(0.020)	(0.011)	(0.012)	(0.010)	(0.013)	(0.019)	(0.019)	(0.019)	(0.017)	(0.017)
Univ. degree	0.074	0.138***	0.270***	0.135***	0.063	0.281***	0.138**	0.056**	0.010	0.067***	0.177***	0.060	−0.042	−0.154**	−0.048	−0.141***
	(0.064)	(0.052)	(0.062)	(0.050)	(0.039)	(0.058)	(0.063)	(0.028)	(0.031)	(0.023)	(0.038)	(0.063)	(0.065)	(0.064)	(0.054)	(0.051)
High school	−0.020	0.021	0.076**	0.029	0.004	−0.005	0.005	0.011	−0.027	0.019	0.084***	0.016	−0.028	−0.010	0.032	−0.001
	(0.038)	(0.033)	(0.036)	(0.031)	(0.027)	(0.037)	(0.037)	(0.021)	(0.020)	(0.018)	(0.028)	(0.038)	(0.038)	(0.038)	(0.034)	(0.035)
No school	0.022	0.026	0.087	0.094*	0.046	−0.039	−0.037	−0.017	−0.033	−0.019	0.059	−0.056	0.003	0.012	−0.041	−0.023

	(0.076)	(0.063)	(0.073)	(0.056)	(0.044)	(0.078)	(0.078)	(0.046)	(0.041)	(0.040)	(0.053)	(0.076)	(0.077)	(0.076)	(0.071)	(0.067)
South	−0.035	−0.047	−0.064	−0.005	−0.042	−0.027	−0.045	−0.099***	−0.068**	−0.047*	−0.117***	0.003	−0.003	0.005	0.024	0.112**
	(0.049)	(0.043)	(0.046)	(0.040)	(0.034)	(0.047)	(0.049)	(0.033)	(0.033)	(0.026)	(0.038)	(0.047)	(0.049)	(0.049)	(0.042)	(0.044)
Observations	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436	1,436
R-squared	0.027	0.045	0.097	0.085	0.092	0.154	0.111	0.061	0.070	0.043	0.116	0.062	0.022	0.051	0.059	0.085

The estimation method: Linear probability model. Huber-White robust standard errors are in parentheses below the coefficients. Additional controls are shown in Table 3. * p < 0.1; ** p < 0.5; *** p < 0.01.

Table 5. Linear probability model with interaction variables: The second questionnaire

VARIABLES	a2 Changes in LE	a3 LE and Pens.	a4 Numeracy	a5 Inflation	a6 Int. Comp.	a10 Diversifica-tion
Constant	0.733***	0.351***	0.731***	0.806***	0.452**	0.933***
	(0.053)	(0.056)	(0.050)	(0.040)	(0.059)	(0.025)
Treated	−0.071	0.079	0.140***	0.090**	0.159**	0.031
	(0.058)	(0.062)	(0.046)	(0.040)	(0.061)	(0.025)
TreatedxFemale	0.097	0.087	0.004	0.010	0.008	−0.046
	(0.061)	(0.071)	(0.051)	(0.044)	(0.070)	(0.030)
TreatedxWh. Collar	0.083	0.033	−0.037	−0.024	0.003	0.001
	(0.065)	(0.072)	(0.053)	(0.043)	(0.071)	(0.030)
TreatedxAge dev.	−0.010**	−0.007*	0.001	−0.003	−0.000	0.000
	(0.003)	(0.004)	(0.002)	(0.002)	(0.003)	(0.001)
TreatedxAgedevSq.	0.000	0.000	0.000	−0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TreatedxUn. Degree	−0.187**	−0.106	−0.049	−0.050	−0.172*	−0.046*
	(0.068)	(0.083)	(0.052)	(0.036)	(0.069)	(0.021)
Treated x South	0.075	0.054	−0.031	0.017	−0.042	0.025
	(0.069)	(0.077)	(0.057)	(0.047)	(0.073)	(0.035)
Distance in deviation	−0.036**	−0.012	−0.012	−0.010	0.002	0.002
	(0.014)	(0.016)	(0.010)	(0.007)	(0.015)	(0.005)
Female	−0.014	−0.078*	−0.028	−0.062*	−0.092*	0.012
	(0.038)	(0.041)	(0.038)	(0.030)	(0.042)	(0.020)
White collar	0.068	0.028	0.064	0.090***	0.089*	0.015
	(0.042)	(0.045)	(0.040)	(0.035)	(0.046)	(0.022)
Age dev.	0.077***	0.011	−0.043*	0.048***	0.043*	0.005
	(0.022)	(0.023)	(0.021)	(0.016)	(0.023)	(0.011)
Age dev. squared	−0.029	−0.041*	−0.013	0.008	0.002	−0.005
	(0.018)	(0.019)	(0.017)	(0.012)	(0.019)	(0.009)
Univ.degree	0.128**	0.278***	0.103*	0.064	0.300**	0.077***
	(0.056)	(0.065)	(0.053)	(0.043)	(0.062)	(0.026)
High school	0.018	0.079*	−0.008	0.005	0.019	0.028
	(0.040)	(0.042)	(0.036)	(0.032)	(0.044)	(0.023)
No school	0.002	0.109	0.177***	0.025	0.086	−0.004
	(0.080)	(0.083)	(0.044)	(0.056)	(0.086)	(0.048)
South	−0.056	−0.068	−0.007	−0.045	−0.042	−0.051*
	(0.044)	(0.047)	(0.041)	(0.035)	(0.048)	(0.027)
Observations	1,072	1,066	1,063	1,060	1,059	1,058
R-squared	0.057	0.101	0.085	0.096	0.137	0.040

The estimation method: Linear probability model. Huber-White robust standard errors are in parentheses below the coefficients. Additional controls: Dummies for birth in central Italy or outside of the country; dummies for investment lines and voluntary extra contributions; dummies for years of contributions in deviation from their mean; and dummies for the number of early withdrawals in deviation from their mean. * p < 0.1; ** p < 0.05; *** p < 0.01.

Table 6. Three-month migration matrix

The table reports the unconditional migration behavior of the *treatment* ("T2") sample and matched individuals within three months after completing the online seminar. Initial investment lines are reported in rows, while final investment lines are reported in columns.

			Matched sample					Treated sample				
			Final investment line				Total	Final investment line				Total
			1 - Money market	2-Safety	3-Income	4-Growth		1 - Money market	2-Safety	3-Income	4-Growth	
Initial invest-ment line	1 - Money market	N	352	0	2	0	354	160	2	10	5	177
		% Initial	99.4%	0.0%	.6%	0.0%	100.0%	90.4%	1.1%	5.6%	2.8%	100.0%
	2-Safety	N	0	215	0	1	216	0	106	2	0	108
		% Initial	0.0%	99.5%	0.0%	.5%	100.0%	0.0%	98.1%	1.9%	0.0%	100.0%
	3-Income	N	0	1	935	0	936	0	1	462	5	468
		% Initial	0.0%	.1%	99.9%	0.0%	100.0%	0.0%	.2%	98.7%	1.1%	100.0%
	4-Growth	N	0	2	0	338	340	0	0	1	169	170
		% Initial	0.0%	.6%	0.0%	99.4%	100.0%	0.0%	0.0%	.6%	99.4%	100.0%

Table 7. Linear probability model: The actual change in investment lines (over three months from online seminar)

This table reports the outcomes of (seven) alternative specifications for the linear probability model in which the dependent variable is equal to 1 for the individuals who changed their investment lines over 12 months from the online seminar. The sample is composed of 923 trios in which one *treatment* individual is matched with two *control* individuals with the same age, gender, job qualification (blue vs. white collar), level of education, and initial investment line (Money Market Plus, Growth, etc.). Matched individuals are only allowed to serve as a match once.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	−0.00542	−0.0644	−0.0106	−0.00990	−0.00176	−0.00522	0.00160
	(0.162)	(0.292)	(0.162)	(0.162)	(0.163)	(0.162)	(0.163)
Treated * "Money Market Plus"	0.0904***	0.0905***	0.0860***	0.0746***	0.0749***	0.0636***	0.0640***
	(0.00983)	(0.00984)	(0.0102)	(0.0149)	(0.0149)	(0.0156)	(0.0156)
Treated * "Money Market Plus" * Age (dev.)						−0.00342**	−0.00338**
						(0.00144)	(0.00145)
Treated * "Income"	0.0118*	0.0118*	0.0135**	−0.000582	1.86e-05	0.00165	0.00224
	(0.00606)	(0.00606)	(0.00615)	(0.0126)	(0.0126)	(0.0126)	(0.0126)
Treated * "Safety"	0.00927	0.00939	0.0113	−0.00302	−0.00248	−0.00102	−0.000442
	(0.0126)	(0.0126)	(0.0126)	(0.0167)	(0.0168)	(0.0167)	(0.0168)
Treated * "Growth"	2.67e-05	0.000175	−0.00152	−0.0158	−0.0153	−0.0111	−0.0107
	(0.0100)	(0.0101)	(0.0101)	(0.0150)	(0.0151)	(0.0151)	(0.0152)
Treated * Female				−0.00590	−0.00575	−0.00604	−0.00593
				(0.0111)	(0.0111)	(0.0111)	(0.0111)
Treated * White Collar				0.000682	−5.71e-05	0.000867	0.000143
				(0.0112)	(0.0112)	(0.0111)	(0.0112)
Treated * No School				0.00967	0.00972	0.00317	0.00335
				(0.0303)	(0.0303)	(0.0304)	(0.0304)
Treated * High School				0.0183	0.0185	0.0150	0.0152
				(0.0136)	(0.0136)	(0.0137)	(0.0137)
Treated * University Degree				0.0106	0.0112	0.00557	0.00618
				(0.0171)	(0.0171)	(0.0172)	(0.0172)
Treated * Central Italy				0.00263	0.00246	0.00236	0.00218
				(0.0110)	(0.0110)	(0.0110)	(0.0110)
Treated * Born abroad				−0.00610	−0.00457	−0.00885	−0.00741
				(0.0283)	(0.0283)	(0.0283)	(0.0283)
Treated * Southern Italy				0.00515	0.00527	0.00451	0.00460
				(0.0116)	(0.0116)	(0.0116)	(0.0116)
Treated * Age (dev.)			−0.000868	−0.000742	−0.000751	−0.000196	−0.000213
			(0.000535)	(0.000557)	(0.000558)	(0.000602)	(0.000603)
Female	−0.00604	−0.0197	−0.0125	−0.0150	0.00171	−0.00793	0.00641
	(0.128)	(0.140)	(0.128)	(0.129)	(0.131)	(0.129)	(0.131)
White collar	−0.0408	−0.181	−0.0841	−0.115	−0.0819	−0.0674	−0.0375
	(0.653)	(0.875)	(0.653)	(0.659)	(0.660)	(0.658)	(0.659)
Age (dev.)	0.00151	0.00964	0.00340	0.00448	0.00364	0.00255	0.00180
	(0.0235)	(0.0410)	(0.0236)	(0.0238)	(0.0238)	(0.0238)	(0.0238)
Squared Age dev.		−0.000358					
		(0.00148)					
Controls for education level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls for the area of birth	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls for the initial investment line	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	No	Yes
Trio FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-test	1.098	1.096	1.100	1.092	1.089	1.100	1.097
Observations	2,769	2,769	2,769	2,769	2,769	2,769	2,769
R-squared	0.356	0.356	0.357	0.358	0.359	0.360	0.361
F-test	1.098	1.096	1.100	1.092	1.089	1.100	1.097
Prob > F	0.0491	0.0518	0.0449	0.0592	0.0640	0.0460	0.0505

Additional controls: Dummy for birth outside of the country; dummies for investment lines and voluntary extra contributions; dummies for years of contributions in deviation from their mean; and dummies for the number of early withdrawals in deviation from their mean. Huber-White robust standard errors are in parentheses below the coefficients. * p < 0.1; ** p < 0.5; *** p < 0.01.

Table 8. Linear probability model: The actual change in investment lines (over 12 months from the online seminar)

This table reports the outcomes of (seven) alternative specifications for the linear probability model in which the dependent variable is equal to 1 for the individuals who changed their investment lines over 12 months from the online seminar. The sample is composed of 923 trios in which one *treatment* individual is matched with two *control* individuals with the same age, gender, job qualification (blue vs. white collar), level of education, and initial investment line (Money Market Plus, Growth, etc.). Matched individuals are only allowed to serve as a match once.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	−0.00560	−0.0760	−0.0107	−0.0352	−0.0265	−0.0286	−0.0217
	(0.220)	(0.399)	(0.220)	(0.221)	(0.222)	(0.221)	(0.222)
Treated * "Money Market Plus"	0.116***	0.116***	0.112***	0.0912***	0.0916***	0.0758***	0.0761***
	(0.0134)	(0.0134)	(0.0139)	(0.0203)	(0.0203)	(0.0212)	(0.0213)
Treated * "Money Market Plus" * Age (dev.)						-0.00479**	−0.00480**
						(0.00197)	(0.00197)
Treated * "Income"	0.0160*	0.0161*	0.0177**	−0.00197	−0.00185	0.00116	0.00131
	(0.00826)	(0.00826)	(0.00838)	(0.0171)	(0.0172)	(0.0172)	(0.0172)
Treated * "Safety"	0.00464	0.00479	0.00664	−0.0117	−0.0112	−0.00891	−0.00834
	(0.0172)	(0.0172)	(0.0172)	(0.0228)	(0.0228)	(0.0227)	(0.0228)
Treated * "Growth"	2.75e-05	0.000205	−0.00149	−0.0204	−0.0198	−0.0137	−0.0132
	(0.0137)	(0.0137)	(0.0137)	(0.0204)	(0.0205)	(0.0206)	(0.0207)
Treated * Female				−0.00128	−0.00128	−0.00147	−0.00153
				(0.0151)	(0.0151)	(0.0151)	(0.0151)
Treated * White Collar				−0.0217	−0.0219	−0.0214	−0.0216
				(0.0152)	(0.0152)	(0.0152)	(0.0152)
Treated * No School				0.0244	0.0245	0.0153	0.0155
				(0.0413)	(0.0413)	(0.0414)	(0.0415)
Treated * High School				0.0421**	0.0420**	0.0374**	0.0373**
				(0.0186)	(0.0186)	(0.0186)	(0.0187)
Treated * University Degree				0.0341	0.0341	0.0270	0.0270
				(0.0232)	(0.0232)	(0.0234)	(0.0234)
Treated * Central Italy				−0.000665	−0.000519	−0.00105	−0.000917
				(0.0150)	(0.0150)	(0.0150)	(0.0150)
Treated * Southern Italy				0.000934	0.00100	3.92e-05	5.68e-05
				(0.0158)	(0.0158)	(0.0158)	(0.0158)
Treated * Born Abroad				0.0687*	0.0690*	0.0649*	0.0650*
				(0.0385)	(0.0386)	(0.0385)	(0.0386)
Treated * Age (dev.)			−0.000849	−0.000600	−0.000604	0.000164	0.000160
			(0.000730)	(0.000759)	(0.000760)	(0.000820)	(0.000821)
Female	−0.00624	−0.0226	−0.0125	−0.0464	−0.0405	−0.0365	−0.0338
	(0.175)	(0.191)	(0.175)	(0.176)	(0.178)	(0.175)	(0.178)
White collar	−0.0421	−0.210	−0.0845	−0.309	−0.306	−0.243	−0.243
	(0.890)	(1.192)	(0.891)	(0.897)	(0.899)	(0.896)	(0.898)
Age (dev.)	0.00156	0.0113	0.00341	0.0119	0.0117	0.00920	0.00911
	(0.0321)	(0.0559)	(0.0321)	(0.0324)	(0.0324)	(0.0323)	(0.0324)
Squared Age dev.		−0.000427					
		(0.00202)					
Controls for education level	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls for the area of birth	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls for the initial investment line	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional controls	No	No	No	No	Yes	No	Yes
Trio FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,769	2,769	2,769	2,769	2,769	2,769	2,769
R-squared	0.367	0.367	0.367	0.370	0.370	0.372	0.372
F-test	1.147	1.145	1.148	1.149	1.142	1.157	1.150
Prob > F	0.00747	0.00804	0.00732	0.00683	0.00908	0.00475	0.00639

Additional controls: Dummy for birth outside of the country; dummies for investment lines and voluntary extra contributions; dummies for years of contributions in deviation from their mean; and dummies for the number of early withdrawals in deviation from their mean. Huber-White robust standard errors are in parentheses below the coefficients. * p < 0.1; ** p < 0.5; *** p < 0.01.

Table 9. Intention-to-treat analysis: Effect of the invitation to participate on the actual change in investment lines (over three months)

Number of simulations	1000	2000
Mean Alpha	0.00156	0.00154
Mean Beta (Invited)	0.00108	0.00109
Mean S.E. (Invited)	0.00054	0.00054
Mean p-value (Invited)	0.05273	0.05015
Proportion significant at 10% (Invited)	90.0%	91.4%
Proportion significant at 5% (Invited)	58.0%	60.3%
Proportion significant at 1% (Invited)	2.5%	2.7%
Number of observations	133,731	133,731

Controls: The interactions between gender, white/blue collar, education, macro-region of birth, initial investment line, and age in deviation; years of contributions in deviation from their mean; and the number of early withdrawals in deviation from their mean.