The Effect of Financial Education on Risky Financial Decisions: Experimental Evidence[*]

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Abstract

Many financial decisions involve risk or uncertainty. With financial products getting more and more complicated, it becomes increasingly hard for people to fully grasp the consequences of the risky financial decisions that they take. Research has shown that the lack of financial literacy is more pronounced within young adults (Lusardi, Mitchell and Vilsa, 2010). As a result, young adults are exposed to a variety of financial risks. In this paper, we study the effect of financial education on four different financial decisions that involve risk. To do that, we ran as part of an educational intervention an incentivized experiment that consisted of (*i*) a risky investment task, (*ii*) an insurance task, (*iii*) a mortgage plan task, and (*iv*) a portfolio task. We found limited support for the effect of financial education on these financial decisions. More precisely, participants in the treatment group spent less on insurance than those in the control group. Moreover, we observed that financial education has no significant effect on risk taking in the other tasks. We also report that women as compared to men made less risky choices in the insurance, mortgage and portfolio tasks.

JEL Classification: D14, I21.

Keywords: Financial education, financial literacy, financial behavior, risk attitudes, investment, insurance, loan repayment plan, portfolio choice.

1 Introduction

Many financial decisions involve risk or uncertainty. With financial products getting more and more complicated, it becomes increasingly harder for people to fully grasp the consequences of the risky financial decisions they take. Research has shown that the lack of financial literacy is more pronounced within young adults (Lusardi, Mitchell and Vilsa, 2010). As a result, young adults are exposed to a variety of financial risks.

A notable observation in the last decade is that alternatives to traditional banks (e.g, FinTech companies) and financial products (e.g., cryptocurrencies) have burgeoned, thanks to advancements in mobile devices and financial technologies. The introduction of FinTech companies intensified competition in the market for financial intermediation. This has caused participation costs (e.g., fees, commission) to decrease at an unprecedented rate and made opening a trading account significantly easier and quicker. As a result, young adults have been investing in financial markets more than ever before. Participation in financial markets from this age group surged even further, especially during the Covid-19 pandemic (Zarroli, 2020). Tight lockdowns allowed people to explore investment opportunities and eventually to start investing with online trading applications.[1] During the lockdown periods, many media outlets drew attention to excessive risk taking among young adults in financial markets, which also brought about personal tragedies. (See, e.g., the tragic suicide news reported by Klebnikov and Gara (2020) on Forbes.) It appears that young people downplay the risks associated with certain financial products. Therefore, it is essential to identify the reasons why young people downplay risks when taking certain financial decisions.

Investment decisions in financial markets are not the only type of financial decisions for young people that involves risk. They also need to protect themselves against adverse events that may result in loss of income and insurance provides such protection. However, the choice of insurance products has become more and more complex over time, presumably due to the widening range of insurance policies differing in coverage options, deductibles, coinsurance and so on. Also, new and complex insurance products (e.g., identity theft insurance) are not simple enough to understand. More importantly, people comprehend the value of insurance typically after experiencing an adverse event (Simonsohn et al., 2008). As a result, people may either choose to remain uninsured, overinsure

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[1] See, e.g., the BBC article by Hussain and Sherman (2020) about how the lockdown made people turn to investing in stocks, cryptocurrencies and so on, as a way to pass time.

or underinsure. Therefore, understanding reasons behind suboptimal insurance decisions is crucial, given the welfare consequences of it.

Moreover, mortgage plan choice is perhaps one of the most important financial decisions in life (Gathergood and Weber, 2017a, 2017b). Mortgage is a complex financial product and is hard to comprehend for many young adults (Campbell, 2006; Bucks and Pence, 2008). Also, banks and credit unions started to offer different types of mortgage plans, which are called "alternative mortgage products" in the literature. Some of the prospective home buyers may not be well-informed about the terms of such new mortgage products. Besides, they may not fully construe long-term effects of opting for these mortgage products either. Such lack of financial literacy may affect the welfare of households. Despite this, whether financial literacy education has an impact on mortgage plan choice is not well-studied.

In this paper, we study the effect of financial literacy education on four different financial decisions that involve risk. To do that, we ran an experiment that consisted of incentivized tasks aimed to emulate financial decision making in real life. The experiment was part of an educational intervention, which was carried out at the University of Vaasa. It consisted of two courses offered to mainly freshman students, who were placed in control and treatment groups. While students in the treatment group took a financial literacy course, those in the control group took a course on democratic participation and student rights at the university. In the financial literacy course, we covered three main topics, which were (*i*) budgeting and planning, (*ii*) borrowing, (*iii*) saving and investment. In addition to online lectures, digital tasks and online games were assigned to students in order to enhance learning.

To measure learning, students took a pre-test before the lectures started in September 2021 and a post-test after the courses ended in November 2021. They also filled in a survey that was combined with the pre-test. A few days after students took the post-test, we launched the experiment in November 2021. The experiment consisted of four experimental tasks. The first one was a risky investment task adopted from Gneezy and Potters (1997). The remaining three tasks were adopted from Charness et al. (2020) and these were (*i*) insurance, (*ii*) mortgage plan, and (*iii*) portfolio tasks.

We found limited support for the effect of financial education on the risky financial decisions mentioned above. To be more precise, financial education decreased insurance spending in the insurance task. Adding the test score variable in regression models with the treatment variable renders the coefficient estimates of the latter insignificant in the insurance task. This suggests that improved financial literacy mediates the relation between the treatment and insurance intake.

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Moreover, financial education and also financial literacy test scores had no effect on risky investment, mortgage plan choice and portfolio choice. General attitude of the participants towards risk had significant effect on mortgage plan choice, though. We also report a gender difference in risk taking in the insurance, mortgage and portfolio tasks: Women as compared to men made less risky choices in the insurance and portfolio tasks.

The organization of the paper is as follows: We begin with providing a review of the relevant literature in the next section. In Section 3, we provide an extensive description of the intervention. Section 4 describes the design of the experiment. We present in Section 5 some descriptive statistics and our estimation results.

2 Literature review

Shaping financial behaviors in desired ways is crucial for policymakers. Hermansson and Jonsson (2021) report that more financially literate customers of a Swedish bank are more likely to be risk averse in financial decisions, which would be desired from a policy perspective. In that regard, financial literacy education can in principle act as a policy instrument. Numerous studies investigated the effect of financial literacy on a plethora of financial behaviors. For instance, Bruhn et al. (2013) carried out a financial literacy education intervention in a sample of high school students in Spain and found that the intervention significantly increased participants' savings for prospective purchases. Moreover, Urban et al. (2020) report that taking a financial literacy course in high school results in fewer defaults and higher credit scores among young adults aged between 18 and 21 in the US. While these studies show that financial education can shape financial behavior in desired ways, a more challenging matter is how it shapes financial behavior. One possible factor that can mediate this relationship is economic preferences, which leads us to the question of whether financial education can also affect economic preferences.

Economists traditionally assume that preferences, in particular risk preferences, are stable and not so malleable (Stigler and Becker, 1977). However, recent studies show that preferences can well change as a result of impactful environmental, economic, social or personal life events (see, e.g., Schildberg-Hörisch, 2018 and the references therein). For instance, Malmendier and Nagel (2011) investigate whether experiences of significant stock market downturns within one's lifetime affect risk attitudes. They report that such individuals have lower willingness to take financial risks and are less likely to participate in the stock market. Cameron and Shah (2015) examine whether experiencing a natural disaster affects risk-taking behavior. Using experimental risk elicitation tasks, they show that individuals who recently suffered a flood or earthquake are more risk averse.

In the context of financial literacy, Alan and Ertac (2018) carried out a financial education intervention with a sample of primary school students in Turkey and found that the intervention significantly increased participants' patience. Lührmann, Serra-Garcia and Winter (2018) show in an experimental setting that adolescents who took a financial literacy course became less present-biased and made fewer mistakes when making financial decisions. They, however, do not find a significant change in the degree of patience of the participants. Bruhn et al. (2013) report evidence that the large intervention they carried out in Brazil affected students' intertemporal preferences. Bover, Hospido and Villanueva (2018) study the hypothetical choices of adolescents in an intertemporal saving task. Participants in the treatment group of their educational intervention on financial literacy were more patient than those in the control group. The same participants exhibited a similar pattern of decisions in an incentivized convex time budget task. Sutter et al. (2020) report that financial education makes adolescents more patient and less present-biased. Moreover, Oberrauch and Kaiser (2020) report that financially more literate participants made more patient decisions in a convex time budget task.

In light of these studies, one would also expect that financial literacy education can in principle shape risk preferences when making financial decisions. The only study we are aware of that tests this in an experimental setting is Sutter et al. (2020),[2] who report that taking a financial literacy course made participants in their study slightly more risk-averse. Our study differs from Sutter et al. (2020), in that they do not investigate risk taking behavior in different contexts. Moreover, participants in our intervention were mainly young adults, whereas they study the economic preferences of adolescents. In addition to this study, there is also indirect but not so clear-cut evidence from stock market participation: Numerous studies, in particular Van Rooij, Lusardi and Alessi (2011), find a robust relationship between financial literacy and stock market participation. Liao et al. (2017) show that the higher financial literacy, the more likely a person would own risky assets and, conditional on owning risky assets, the higher the share of risky assets in one's savings. Black et al. (2018) show that having more compulsory education increases stock market participation and share of wealth invested in stocks for men in Sweden. They don't find a significant effect for women, though. Also, this paper studies the effect of compulsory education, but not financial literacy education, on stock market participation.

Moreover, research also shows a gender gap in stock market participation. Van Rooij, Lusardi and Alessi (2011) and Lusardi and Mitchell (2008) attribute this observation to women's lower

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[2]We were not aware of this study when we planned the current study in early 2020 and launched the intervention in late 2020.

financial knowledge. While Almenberg and Dreber (2015) find that the gender gap in stock market participation is as a result of lower numeracy among women, Prast et al. (2015) report that this is due to lack of familiarity with financial products.

People routinely face with the risk of experiencing adverse events that would result in financial losses. Insurance as a financial product protects individuals from such adverse events. In that regard, insurance improves the welfare of individuals by providing financial security. Research has shown that people insure against risks suboptimally, which causes financial loss. More precisely, people typically underinsure against rare risks with serious consequences (e.g., health, natural disasters) (Kunreuther and Pauly, 2004) but at the same time overinsure against moderate risks (e.g., home insurance) (Schmidt, 2016; Sydnor, 2010; Cicchetti and Dubin 1994). A strand of literature focuses on behavioral biases as potential sources of the anomalies in insurance decisions, including the decision to not purchase insurance at all. For instance, De Donder and Leroux (2013) study a political economic model of long-term care and show that myopia and optimism cause individuals to under-insure themselves and support less social insurance. Kunreuther, Pauly and McMorrow (2013) also emphasize myopia as a source of underinsurance. Moreover, Brown et al. (2008) report that demand for an annuity product depends on how it is framed. Schmidt (2016) analyzes insurance demand under prospect theory and shows that people are reluctant to insure themselves against rare risks and at the same time buy overpriced insurance for moderate risks. Hwang (2016) found that loss aversion decreases insurance uptake. Hsee and Kunreuther (2000) show that affection to an object increases willingness to buy insurance. Using an experiment that features a typhoon insurance task, Yin et al. (2016) show that availability through experience also affects insurance demand. However, none of these studies test the effect of financial literacy on insurance demand.

Recently, Lin, Bruhn and William (2019) and Pitthan and de Witte (2021) proposed financial literacy as another factor that would potentially affect insurance uptake. Using survey data collected in Sri Lanka, Weedige et al. (2019) investigate the effect of insurance literacy on purchasing decisions of personal insurance. They find that people with better insurance literacy are more sympathetic towards insurance. We contribute to this literature by testing the effect of financial literacy education on insurance demand using an experimental insurance task. Eling, Ghavibazoo, Hanewald (2021) investigate the effect of attitude towards risk on long-term care and life insurance uptake in 14 countries. They report that people who are more willing to take financial risks have higher insurance uptake. Combined with the relationship between financial literacy and risk aversion that Hermansson and Jonsson (2021) report, this result suggests that people who took a financial literacy course and improved their financial literacy may end up purchasing less insurance, which is in line with the

result we report in this paper.

Earlier studies focused on the relation between becoming a home owner and financial literacy. For instance, using a survey of households in Ohio, Haurin and Morrow-Jones (2006) show that racial financial literacy gap contributes to racial home ownership gap. Using data from a survey of a representative sample of English and Welsh households on home ownership, Gathergood and Weber (2017a) study whether financial literacy affects the choice of (*i*) home ownership and (*ii*) the type of mortgage products among young people. They find that young home owners have a higher financial literacy score than non-owners and that young home owners with poor financial literacy end up with larger mortgage debts and more likely choose alternative mortgage products (e.g., interest-only mortgage). In another paper, Gathergood and Weber (2017b) report that individuals with poor financial literacy and present bias are more likely to choose alternative mortgage products. Our study differs from the latter two studies in three respects: First, by way of an experiment, we test the effect of an *educational intervention* on mortgage plan choice. Second, along with financial literacy, we study whether risk aversion has an impact on the choice of fixed versus mortgage plan and also portfolio choice. We believe that risk aversion would have an impact on such a choice involving interest rate uncertainty over a typically long mortgage repayment term. Third, we study other financial decisions involving risk than mortgage plan choice.

3 Description of the intervention design and the sample

In this section, we provide details of the intervention design. More specifically, we shall provide information about the courses, the measurement of learning for the financial literacy course, the survey and the participant selection.

3.1 Courses. As part of the intervention that we carried out at the University of Vaasa, we offered two freshman courses to the participants. Before the intervention started, freshman business and economics students were randomly assigned to control and treatment groups.[3] In the fall term of 2021, the treatment group was offered a financial literacy course, while the control group took a course that focuses on student as part of the university community, student rights and democratic participation at the University of Vaasa. By offering the latter course to the control group, we aimed to avoid self-selection and also to mitigate the concerns for the so-called Hawthorne effect. For the fall term, the courses started in mid-September and ended at the end of October. In the spring term, students in the control and treatment groups switched courses. For the spring term, the courses

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[3]In Section 3.4, we provide more details about this process and discuss the limitations that we faced.

started in mid-March and ended at the end of April. The timeline of the intervention can be seen in Figure 1 below.
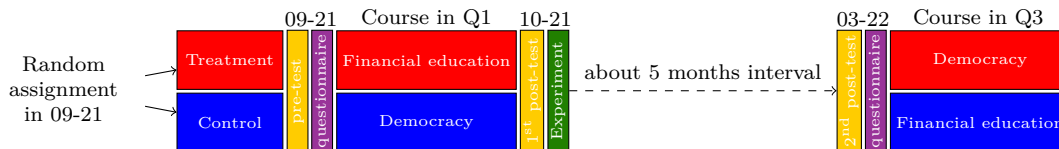

Figure 1: Timeline of the intervention

The financial literacy course that we offered to the treatment group was designed to improve the financial management skills of the university students with the hope that they would be able to live an independent and healthy financial life. The course was offered as a 6-week online course. Topics covered during the course were budgeting and planning, consumption smoothing, insurance, borrowing, saving and investment. The students were required to complete several tasks that utilize digital tools and online games, write short reports, and fill in questionnaires based on those tasks. We offered participants an online game called TalousTandem, which was also available as a mobile app.[4]

3.2 Measurement of learning. We planned to measure course learning using three separate tests given to students at three points in time, specifically in September 2021, November 2021 and March 2022. The pre- and the two post-tests included 15 financial literacy questions and 15 questions related with students rights and democratic participation at the University of Vaasa. Students registered in either of the two courses participated in the pre-test before the courses started in September, where they were asked several multiple-choice knowledge questions both on topics of financial literacy and knowledge on student rights and participation at the university. After the courses ended in October, they took a post-test also, which we refer to as the "first post-test." This first post-test included new knowledge items that were different from those in the pre-test. Before the start of the two courses within our intervention in March 2022, the students took a third test, which we refer to as the "second post-test." In this paper, we use only the first post-test conducted in November 2021.

3.3 Survey. In tandem with the pre-test, students also answered survey questions on a variety of behaviors related with the two courses offered within the intervention. In the financial literacy part of this survey, we collected extensive financial and psychological data, the aim of which was to control for the heterogeneity in students' learning upon taking the financial literacy course. As

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[4]More information on TalousTandem can be obtained from https://sites.uwasa.fi/peek/talouspeli/.

usual, we also collected detailed demographic data. There were also questions related with current studies and prior financial education. In the current study, we use demographic data, information on current studies and prior financial education, a 6-item socioeconomic status scale adopted from Griskevicius et al. (2011), and a question from the German Socio-Economic Panel (SOEP) that elicits willingness to take risks in general (Wagner, Burkhauser and Behringer, 1993).[5]

3.4 Sample. Majority of the participants who participated in the intervention were freshman students. However, according to the university regulations, it is not possible to impose strict eligibility criteria for enrolling on a course offered at the university. For this reason, we were not able to prevent students from taking either or both of the courses that we offered to the freshman students. We placed those who signed up for both courses in the treatment group.

As mentioned earlier, an initial group, mainly consisted of freshman students, were randomly assigned to two courses in early September 2021. Our randomization process was based on the alphabetically ordered surnames of the students. We believe that in Finland, this practice is not different from random draw of the names.[6] A concern for this type of assignment is the presence of siblings or relatives with the same surname. However, we believe that having siblings enrolling the same university in the same year is very rare in Finland, given the social structure. A second concern for such an assignment method is that in principle, the surnames may indicate socioeconomic status and such surnames may not be homogenously distributed in the alphabet. However, surnames in Finland usually do not indicate social status. Also, surnames that indicate social status are rare.

In September 2021, 300 students took the pre-test and gave consent to the use of their data for research purposes by the authors of this study.[7] As mentioned before, our initially randomized sample was comprised of freshmen business / economics students. We chose to restrict our sample to this group for two reasons: First, non-freshman students would have already taken some economics and finance courses already before they take the financial literacy course we offer. We believe that the finance course we offered would have marginal effect on the financial literacy of these students. Second, we didn't have the chance to randomize the non-business / economics students due to influence over the administrative division these students are registered to.

Since we were not able to restrict the registration to the courses we offered, there were stu-

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[5]We defer the analysis of the rest of the survey data to a companion study on financial literacy.

[6]We chose this method to reduce the workload of the administrative personnel.

[7]We do not know the exact number of all students who took the pre-test, including those who did not give consent to the use of their data. We do not know that for the post-test either. Due to privacy concerns, we programmed the survey in way that it did not record the entries of those who did not give consent. Some students might have dropped and some others might have started the course after the pre-test. As a result, the number of students who gave consent in the pre- and post-tests differed.

dents in our intervetion who were not in the initially randomized group. More specifically, 66 of those who took the pre-test and gave consent were not freshman students and 30 of them were not business / economics students. In total, 74 of the 300 students were neither freshman nor business / economics students. We do not include these students in our study. Hence, the number of students in the pre-test reduces to 226. Of the 226 students, 144 were female students. We note that 13 students signed up for both of the courses.[8] 120 of the 226 students who took the pre-test were in the treatment group and 54 of these were female. Moreover, 53 of the 106 participants in the control group were female students.

At the beginning of November, 342 students took the post-test and gave consent to the use of their data. 68 of them were not freshman students and 27 of them were not business / economics students.[7] In total, 73 of the 342 students were neither freshman nor business / economics students. As we explained before, we do not include these in our study. Therefore, the number of students that we include in the post-test reduces to 269. 20 of these students signed up for both courses.[8] 141 of the remaining 269 students who took the post-test were in the treatment group. 52 of the 141 students in the treatment group and 65 of the 128 participants in the control group were female.

Just after the post-test, we ran the online incentivized experiment at the beginning of November 2021. Participation in the experiment was voluntary and as a result, 189 students who participated in the intervention attended the experiment. 32 of them were not freshman students and 17 of them were not business / economics students. In total, 36 of the 189 students were neither freshman nor business / economics students. According to our exclusion criteria, we do not include these 36 students in our study. As a result, the number of students we include in the experiment reduces to 153. 81 of these 153 students were female and 72 of them were male. There were 75 students in the control group, 45 of which were female. In the treatment group, there were 78 students and 36 of them were female. Moreover, only 6 students took both the control and the treatment courses.

We note that although we asked students which of the two courses we offered within our intervention they took, we used the course registration information from the Moodle course management system.[9] Our inclusion criterion for the treatment group was simple: Those who registered for the financial literacy course were regarded to be in the treatment group, even though they had only one day of activity on the Moodle pages of the course. As not all the students completed the treatment

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[8]This figure is based on the Moodle course registration information. Some of these students registered for both courses but did not attend at all or attended only a few weeks. Hence, the actual number of students who completed both courses might be different.

[9]We chose to use the Moodle data because we came across incorrect responses (i.e., answers that were not matching with the actual course registration data) to the course registration question that was asked to the students at the beginning of the experiment.

course, this inclusion criterion would not create an upward bias in our results. On the contrary, it would only reduce the strength of any significant treatment effect observed.

Table 1 summarizes the share of female students in each group. While the initial gender composition in the control and treatment groups were quite similar and not significantly different from each other in the pre-test in September 2021, this initial gender balance between the two groups disappeared in the post-test and the experiment. The difference in the share of female and male students between the control and treatment groups in the experiment is significant at 10% level according to a two-sample proportions test.

Table 1: Gender composition in the pre-test, 1st post-test and the experiment[a]

	Whole sample		Control group		Treatment group		
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	$p-$value
Female - Pre-test ($n = 226$)	0.474	0.500	0.500	0.502	0.450	0.046	0.4525^b
Female - 1st Post-test ($n = 269$)	0.435	0.497	0.508	0.502	0.369	0.484	$0.0216^{**,\ b}$
Female - Experiment ($n = 153$)	0.530	0.501	0.600	0.493	0.462	0.502	$0.0863^{*,\ b}$

[a] *, **, *** denote, respectively, 10%, 5% and 1% significance levels. [b] $p-$value for a two-sample proportions test.

As can be deduced from the discussion above, some students either did not attend the pre-test, the post-test or the experiment. This means that merging the survey that we collected along with the pre-test with the post-test and the experiment would reduce our sample. When we merge these three datasets, we end up with 128 students for the analysis of the data that we collected in the experiment. 64 of these were in the treatment group, and 64 were in the control group. The age of the students who participated in the experiment, the pre- and post-tests ranged between 18–56, with a mean of 21.73 (std. dev. = 5.56). Out of the 128 students, 67 were female students and 61 were male students. In the control group, 38 out of 64 students were female, whereas 29 out of 64 were female in the treatment group. On average, participants lived 1.38 years (std. dev. = 2.45) independent from their families. Only 3 out of the 128 participants reported that they have kids. Moreover, about two thirds of the participants stated that they live alone.

Table 2: Summary statistics about the participants after merging three datasets[a]

	Whole sample ($n = 128$)		Control group ($n = 64$)		Treatment group ($n = 64$)		
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	$p-$value
Age	21.734	5.564	21.891	5.774	21.578	5.386	0.7521^b
Female	0.523	0.501	0.594	0.495	0.453	0.502	0.1112^c
Years lived ind.	1.375	2.450	1.531	2.576	1.219	2.326	0.4727^b
Has children	0.023	0.152	0	0	0.047	0.213	$0.0797^{*,\ c}$
Lives alone	0.688	0.465	0.656	0.479	0.719	0.453	0.4456^c

[a] *, **, *** denote, respectively, 10%, 5% and 1% significance levels. [b] $p-$value of a $t-$test. [c] $p-$value of a two-sample proportions test.

Selected summary statistics about the participants is provided in Table 2, which shows that in the resulting sample, first-year and business students in the control and treatment groups significantly differ from each other.[10] Also, the share of female students in the control group is higher than that in the treatment group, though the difference is not statistically significant. This imbalance, particularly in the share of female students, might have potentially affected our results presented in Section 5.

4 Experiment design

In addition to the learning outcomes, we tested behavioral implications of financial education course. We measured learning implications on financial behavior with four experimental tasks, where students faced real monetary payoff implications of their decisions. The tasks offer an alternative way to analyze the effectiveness of financial literacy courses. Three of the tasks were related to financial decisions: insurance, mortgage and portfolio tasks. These three tasks were adopted from Charness et al. (2020). A fourth task aimed to elicit participants' risk preferences, which was adopted from Gneezy and Potters (1997) (hencefort, risky investment task).

We ran the experiment online using oTree (Chen, Schonger and Wickens, 2016), an online open-source experiment platform based on Python and Django web framework. Due to the pandemic, we were not able to gather students in a classroom or a computer laboratory and run the experiment in a few sessions. oTree can be run on any device with an internet connection and a browser and eliminated the need for a computer laboratory or a classroom. As the time that we ran the experiment was a busy period for students.[11] As a result, we decided to give students 10 days to attend the experiment.

We informed students of the experiment when they were taking the courses in our intervention and later, announced the launch of the experiment and invited them to participate. The online experiment started with a consent screen that provides information about how the collected data will be handled and payment structure. A screen for general instructions followed the consent screen. In particular, they were promised to receive a 5€ participation fee and up to 15€ earnings from the tasks during the experiment. They were also informed that one of the four tasks will randomly be chosen for payment, that if the task chosen for payment has more than one round, one of the rounds of that task will randomly be chosen for payment and that they will be paid what they earned in the randomly drawn round of the randomly drawn task for payment.

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[10]We provide the summary statistics of all the variables in the Table 9 in Appendix G.

[11]It was the end of the quarter academic year and students were busy with their exams and / or assignments, projects and so on.

Before they started the experiment, students answered several questions that aimed to test students' knowledge on general instructions. Students were not able to continue to the first task until they managed to answer all the questions correctly. Then, they proceeded to the experimental tasks, whose brief descriptions are as follows:

4.1   Risky investment task. At the beginning of the task, participants were informed that they have an initial endowment of 6€. They could invest any amount from their endowment in a risky project. They were told that the project will be successful with a certain probability. If the project is successful, they could get back 2.5 times the amount that they invested and if not, they lose the amount invested. Participants made two decisions in two separate rounds of this task. In the first round, the probability of success was given as 50%, whereas it was only 10% in the second round. The purpose of the lower probability of success in the second round was to test how participants react to extreme risk. In this setting, the expected value and the variance of the two lotteries increase with the amount invested. We note that for a risk averse person, the amount invested decreases as risk aversion increases. For a risk neutral or risk seeking person, however, the optimal decision is to invest all the initial endowment.

4.2   Insurance task. At the beginning of the task, participants are given 15€. However, they face with the risk of losing this amount. More specifically, with a 10% probability, the participants may lose all of their initial endowments. However, they can insure themselves against this risk. They can buy any amount of insurance up to 5€. If it happens that they lose all the remaining money after paying for insurance, they receive 3 times the amount of insurance they buy. If it happens that they keep their money, the amount they paid to insurance will not be returned to them. Given these, the expected value of the lottery in this context decreases with the amount spent on insurance. We note that for a risk averse person, the amount spent on insurance increases as risk aversion increases. Therefore, the chosen insurance fee should increase as risk aversion increases. For a risk neutral or risk seeking person, however, the optimal insurance spending is zero.

4.3   Mortgage plan task. In this task, participants were told that they (hypothetically) needed to take out a 10€ loan and that this loan must be paid back in 10 years. Participants are informed that they are given a 2€ income every year and they have to pay the interest on the loan. Hence, their payoff from this task is the total income net of interest payment. Participants have three repayment plans,

- The first plan has 8% fixed interest rate.

- The second option has a varying interest rates. The first year, the interest rate is 7%. Any following year, this rate may vary, up to 2 percentage points below or above its value of the previous year.

- The third option has also a varying interest rates. The first year, the interest rate is 6%. Any following year, this rate may vary, up to 4 percentage points below or above its value of the previous year.

As in Charness et al. (2020), a chart that shows the interest rate changes for these three options accompanied the information above. We note that the number of the chosen option decreases as risk aversion increases.

The payment from this task could potentially exceed the 15€ limit[12] we had for this experiment. To avoid this, the code we wrote ensured that the random draw of the interest rate does not yield a payment more than 15€ of earnings from this task. This practive was in line with the information we provided in the informed consent form that the students read and accepted at the beginning of the experiment.

4.4   Portfolio task. At the beginning of each round of this task, participants receive an income of 5€ and an initial capital of 50€. Using all the capital, the participant is asked to make a selection from a bond and stocks of two companies. Initially, the unit price of all three securities is 1€. Next period, the stock prices depend on two possible events (namely, X and Y) with a $50/50$ chance of occurance. The return structures of the three assets are as follows:

- Company A's bond: It yields a fixed return of 0.01€ (i.e., 1 ¢) for each 1€ of investment on this bond regardless of which of the two events occurs.

- Company B's stock: If Event X happens, the stock price will increase by 0.12€ and the participant will earn 0.12€ per 1€ of her investment on this stock. If Event Y happens, the stock price will decrease by 0.06€ and the participant will lose 0.06€ per 1€ of her investment on this stock.

- Company C's stock: If Event X happens, the stock price will increase by 0.20€ and the participant will earn 0.20€ per 1€ of her investment on this stock. If Event Y happens, the stock price will decrease by 0.10€ and the participant will lose 0.10€ per 1€ of her investment on this stock.

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[12]Due to tax implications and the University of Vaasa's payment practices, we had to limit total payment to each participant to 20€ including the 5€ participation fee.

We note that the expected value and the variance of these securities increase in the same direction as their alphabetical order. Therefore, investment in B and C and also the expected value of a portfolio would decrease as risk aversion increases.

We planned this task to be two rounds. In the second round, our aim was to test whether the participants in the treatment group would more likely utilize a given hedging opportunity by suitable diversification of their portfolios. However, the Finnish translation of the second round included a typo[13] that could potentially affect the decisions of the participants. As a result, we decided to not report the results from the second round.[14]

5 Results

As we indicated before, we also ran an experiment that consisted of 4 tasks whose aim was to test whether or not financial literacy education has an effect on financial behavior. In this section we will report the results from these 4 tasks.

5.1 Risky investment task. In the first round of this task, participants chose to invest on average 3.37€ (*std. dev.* = 1.55) in the risky project. The relative frequency distribution of the investment decisions for control and treatment groups can be seen in Figure 2 below. For the sake of ease, the data is binned in 1€ intervals in the figure.
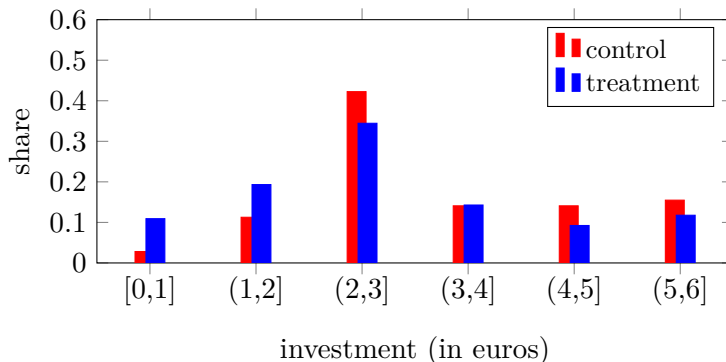
Figure 2: Investment decisions in the first round of risky investment task ($n = 153$)

Those in the control group chose to invest on average 3.51€ (*std. dev.* = 1.47), whereas those in the treatment group chose to invest on average 3.23€ (*std. dev.* = 1.62) in the risky project. The difference between the control and treatment groups in average investment is not significant according to a *t*-test ($p = 0.2725$).

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[13]The typo happened due to an error in the deployment of the latest version of the code, which we were not aware.

[14]The results in the second round do not differ from those in the first round. These results can be provided by the authors upon request.

The distribution of investment decisions made by female and male students can be seen in Figure 3. Female students invested on average slightly less in the risky project ($mean = 3.33$€, $std.$ $dev. = 1.56$) than male students ($mean = 3.41$€, $std.$ $dev. = 1.55$). But this difference is not statistically significant ($p = 0.7581$).
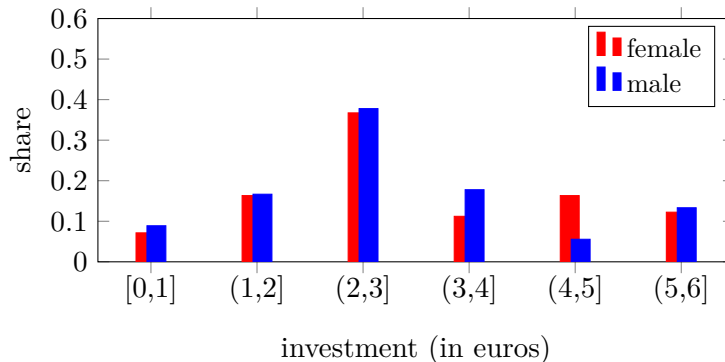
Figure 3: Investment decisions by gender in the first round of risky investment task ($n = 153$)

In the second round of this task, the probability of success was much lower (0.1) than that in the first round (0.5). Participants responded to the increased risk by steeply lowering the amount of their investments. On average, they invested 0.90€ ($std.$ $dev. = 1.17$) in the risky project. The relative frequency distribution of the investment decisions for this round can be seen in Figure 4 below. As before, the data is binned in 1€ intervals for convenience.
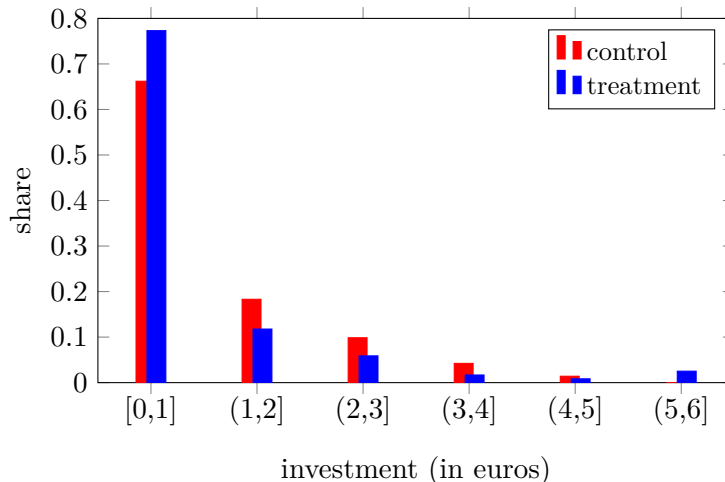
Figure 4: Investment decisions in the second round of risky investment task

As in the first round, average investment in the second round was higher in the control group than in the treatment group: Those in the control group chose to invest on average 0.99€ ($std.$ $dev. =$ 1.12), whereas those in the treatment group chose to invest on average 0.80€ ($std.$ $dev. = 1.22$) in

the risky project. However, according to a t-test, the difference between the control and treatment groups in average investment was not significant ($p = 0.3262$).

Table 3: OLS regression for amount invested in the risky investment task[a]

	(1)	(1R)	(2)	(3)	(4)	(5)	(6)	(7)
Demographics								
Age			0.038	0.036	0.040	0.040	0.045	0.042
			(0.035)	(0.035)	(0.031)	(0.031)	(0.032)	(0.032)
Female	0.237	0.082	0.134	0.075	0.074	0.105	0.041	0.044
	(0.180)	(0.189)	(0.210)	(0.203)	(0.222)	(0.216)	(0.229)	(0.225)
Years lived independent			-0.127**	-0.140**	-0.125**	-0.132**	-0.112**	-0.126**
			(0.060)	(0.060)	(0.055)	(0.056)	(0.054)	(0.055)
Has children			0.702	1.162	1.300*	1.257*	0.978	1.268*
			(0.671)	(0.712)	(0.700)	(0.710)	(0.702)	(0.721)
Lives with partner / spouse[b]			0.010	-0.039	-0.071	-0.099	-0.085	-0.113
			(0.277)	(0.261)	(0.272)	(0.281)	(0.292)	(0.283)
Lives with friend / roommate[b]			0.611**	0.561**	0.555**	0.551**	0.588**	0.553**
			(0.250)	(0.259)	(0.249)	(0.254)	(0.240)	(0.251)
Socioeconomic status								
SES childhood			-0.000	0.007	0.001	0.008	-0.002	0.006
			(0.111)	(0.109)	(0.108)	(0.110)	(0.109)	(0.109)
SES current			-0.057	-0.049	-0.053	-0.051	-0.053	-0.048
			(0.163)	(0.173)	(0.162)	(0.163)	(0.154)	(0.162)
SES future			0.108	0.082	0.105	0.089	0.144	0.110
			(0.097)	(0.100)	(0.103)	(0.098)	(0.098)	(0.102)
Prior financial education								
No prior fin. edu.					-0.275	-0.278	-0.271	-0.265
					(0.228)	(0.228)	(0.228)	(0.227)
Money talked in childhood: 1[c]					0.149	0.101	0.152	0.130
					(0.362)	(0.360)	(0.367)	(0.366)
Money talked in childhood: 2[c]					0.419	0.353	0.406	0.372
					(0.317)	(0.324)	(0.325)	(0.328)
Second round	-2.472***	-2.510***	-2.510***	-2.510***	-2.510***	-2.510***	-2.510***	-2.510***
	(0.132)	(0.147)	(0.149)	(0.149)	(0.151)	(0.151)	(0.151)	(0.151)
Treatment	-0.260	-0.380**		-0.459**	-0.358	-0.439**		-0.367
	(0.183)	(0.191)		(0.197)	(0.222)	(0.191)		(0.222)
Test score					-0.036		-0.064*	-0.035
					(0.040)		(0.035)	(0.040)
Willingness to take risks						-0.038	-0.027	-0.035
						(0.058)	(0.058)	(0.058)
Observations	306	256	256	256	256	256	256	256
R^2	0.472	0.489	0.507	0.520	0.534	0.533	0.527	0.534

[a] Dependent variable is "Amount invested." *, **, *** denote, respectively, 10%, 5% and 1% significance levels. Cluster-robust standard errors are provided in parantheses. A constant and controls for the day of participation in the experiment are included but not reported here. [b] Base category: "alone." "Refused to answer" is included but not reported. [c] Categories: "1: often," "2: sometimes," "3: hardly ever" (base).

To investigate the determinants of investment behavior in this task, we also ran a set of OLS regressions, which can be seen in Table 3. When running the OLS regression, we combined the data from the two rounds of the investment task and used an indicator variable for the second round, which we call *second round*. In our regression specifications, along with the *test score* and *treatment* variables, we used a set of control variables that contained mainly demographic information from the survey that was carried out along with the pre-test.

Regressions show that *treatment* decreased the amount invested in the risky project. However, the coefficient estimate of the *treatment* indicator is not significant in all but two of the regression models. By adding the regression model (1R), we investigated whether the significant results in two of the regression models are as a result of sample selection. As the coefficient estimate of *treatment* is significant in the regression model (1R) but not in (1), we conclude that the significant coefficient estimates are due to sample selection.

We note that when we control for the *test score* in the reduced sample, the coefficient estimate of *treatment* doesn't reach significance. However, the coefficient estimate of *test score* becomes significant when we exclude the *treatment* indicator from the regression model. This suggests that in the reduced sample, the decrease in risk taking due to the *treatment* can be explained by an increase in the *test score*.[15]

Apart from these two findings, we also report that living with a friend (or a roommate) significantly increases the amount invested in the risky project. Moreover, Table 3 suggests that being female does not have a significant effect on the amount investmented in the risky project. Not surprisingly, the lower probability of the prize in the *second round* significantly decreased the amount invested.
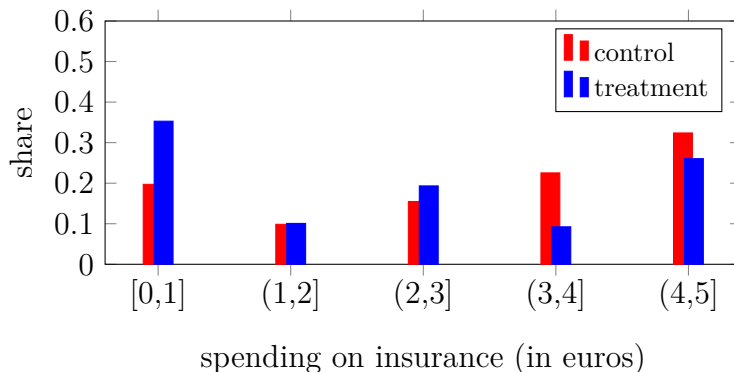
Figure 5: Distribution of insurance spending in the control and treatment groups

5.2 Insurance task. In this task, participants spent on average 2.67€ (*std. dev.* = 1.91) on insurance. The relative frequency distribution of spending on insurance in the control and treatment groups is depicted in Figure 5.

Interestingly enough, average insurance spending was higher in the control group than in the treatment group: Participants in the control group spent on average 3.20€ (*std. dev.* = 1.73), whereas those in the treatment group spent on average 2.16€ (*std. dev.* = 1.94) on insurance. A *t*-test

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[15]In a companion paper, we show that our treatment (i.e., financial literacy course) has increased the test scores at least in the short run.

shows that the difference between the control and treatment groups in average insurance spending is significant ($p = 0.0007$). Given the gender imbalance between control and treatment groups, this result might have been driven by the higher share of female students in the control group. To investigate this, we shall take a look at insurance speding for female and male student groups, which can be seen in Figure 6.
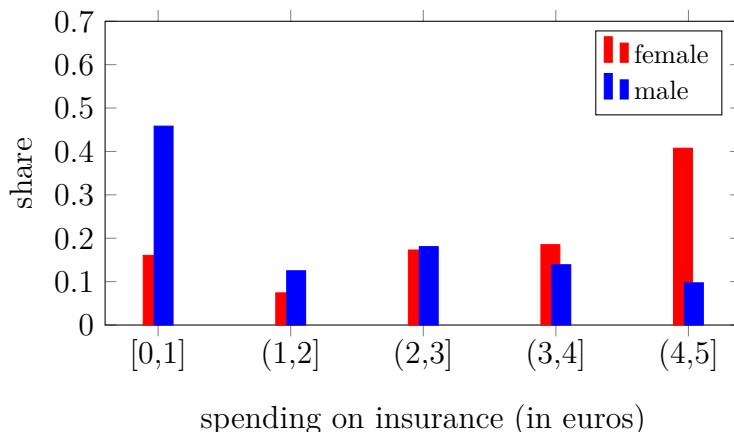

Figure 6: Distribution of insurance spending for female and male students

Female students spent on average more on insurance ($mean = 3.44$€, $std.\ dev. = 1.69$) than male students ($mean = 1.80$€, $std.\ dev. = 1.77$) and this difference is statistically significant ($p < 0.0001$). Hence, higher insurance spending in the control group can be ascribed to the gender imbalance between the control and treatment groups: As the share of female students in the control group is significantly higher than that in the treatment group, we can also expect the insurance spending to be higher in the control group.

We also ran a set of OLS regressions to study insurance spending, whose results are reported in Table 4. We report findings similar to the statistics reported above. That is, the treatment seems to decrease insurance spending. However, the coefficient estimate of the *treatment* indicator is only weakly significant (i.e., significant at 10% level) in the regression models that do not control for the post-test score. When we include the *test score*, this coefficient estimate turns out to be insignificant. *Test score* has also a negative coefficient estimate, which is weakly significant when the *treatment* variable is not included. This suggests that *test score* mediates the effect of *treatment* on insurance spending.

Moreover, the OLS regressions support the previous finding that female participants spent on average significantly more on insurance than male participants. That is, the coefficient estimate of the indicator variable *female* is highly significant and positive. This is in line with numerous findings

in the literature on gender differences in risk taking: Women tend to be more risk averse than men (see, e.g., Croson and Gneezy, 2009). We also note that the coefficient estimate of *willingness to take risks* in general is not significant.

Table 4: OLS regression for amount spent on insurance in the insurance task[a]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Demographics							
Age		0.012	0.008	0.012	0.009	0.018	0.018
		(0.048)	(0.047)	(0.048)	(0.049)	(0.049)	(0.049)
Female	1.563***	1.655***	1.558***	1.465***	1.590***	1.450***	1.420***
	(0.264)	(0.310)	(0.306)	(0.337)	(0.329)	(0.352)	(0.351)
Years lived independent		-0.081	-0.103	-0.083	-0.096	-0.061	-0.097
		(0.106)	(0.104)	(0.106)	(0.106)	(0.107)	(0.107)
Has children		1.222	1.975	1.861	1.824	1.390	1.964
		(1.212)	(1.227)	(1.285)	(1.296)	(1.276)	(1.301)
Lives with partner / spouse[b]		0.512	0.432	0.352	0.367	0.380	0.344
		(0.427)	(0.419)	(0.431)	(0.449)	(0.452)	(0.449)
Lives with friend / roommate[b]		0.233	0.152	0.116	0.111	0.171	0.165
		(0.484)	(0.475)	(0.485)	(0.488)	(0.490)	(0.490)
Socioeconomic status							
SES childhood		-0.039	-0.027	-0.023	-0.015	-0.033	-0.028
		(0.165)	(0.161)	(0.164)	(0.165)	(0.167)	(0.165)
SES current		-0.119	-0.106	-0.114	-0.118	-0.118	-0.103
		(0.191)	(0.186)	(0.189)	(0.190)	(0.192)	(0.191)
SES future		0.045	0.002	0.054	0.009	0.110	0.060
		(0.135)	(0.134)	(0.143)	(0.139)	(0.142)	(0.144)
Prior financial education							
No prior fin. edu.				-0.295	-0.319	-0.300	-0.304
				(0.360)	(0.362)	(0.365)	(0.363)
Money talked in childhood: 1[c]				-0.053	-0.124	-0.025	0.002
				(0.561)	(0.564)	(0.571)	(0.570)
Money talked in childhood: 2[c]				-0.020	-0.079	0.017	0.038
				(0.501)	(0.521)	(0.525)	(0.528)
Treatment	-0.833***		-0.752**	-0.577*	-0.742**		-0.620*
	(0.268)		(0.312)	(0.344)	(0.317)		(0.349)
Test score				-0.078		-0.124*	-0.084
				(0.067)		(0.062)	(0.068)
Risk attitudes							
Willingness to take risks					-0.019	-0.000	-0.016
					(0.101)	(0.101)	(0.101)
Amount invested[d]	-0.097						-0.097
	(0.085)						(0.101)
Observations	153	128	128	128	128	128	128
Prob > F	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001	< 0.001
R^2	0.350	0.334	0.368	0.381	0.373	0.364	0.387

[a] Dependent variable is "Insurance spending." *, **, *** denote, respectively, 10%, 5% and 1% significance levels. Standard errors are provided in parantheses. A constant and controls for the day of participation in the experiment are included but not reported here. [b] Base category is "alone." "Refused to answer" is included but not reported. [c] Categories: "1: often," "2: sometimes," "3: hardly ever" (base). [d] Amount invested in the first round of the risky investment task.

5.3 Mortgage task. In this task, there were three mortgage repayment plans, A, B and C. As we mentioned earlier, A is the option that refers to the fixed but (initially) higher interest rate and B and C to plans with variable interest rate. Recall also that Option C has higher volatility than

Option B. Overall, 32 (roughly %21) of the 153 participants chose Option A, 93 (roughly 61%) of them Option B and 28 (roughly 18%) chose Option C. Participants' choices from among the three mortgage repayment plans in the control and treatment groups are provided below in Table 5.

Table 5: Mortgage repayment plan choices by control and treatment groups

	Option A		Option B		Option C		
	Freq.	Rel. freq.	Freq.	Rel. freq.	Freq.	Rel. freq.	Total
Control	15	0.2000	46	0.6133	14	0.1867	75
Treatment	17	0.2179	47	0.6026	14	0.1795	78
Total	32	0.2092	93	0.6078	28	0.1830	153

As seen in Table 5, the share of participants who chose Option A was slightly more in the treatment group than in the control group, whereas the share of the choice of Option B in the treatment group is slightly less than that in the control group. Consequently, the share of Option C in the treatment group is slightly less than that in the control group. A Pearson χ^2 test indicates that the choices of the three options in the two groups do not differ significantly from each other ($p = 0.962$).

Table 6: Mortgage repayment plan choices by gender

	Option A		Option B		Option C		
	Freq.	Rel. freq.	Freq.	Rel. freq.	Freq.	Rel. freq.	Total
Female	17	0.2099	55	0.6790	9	0.1111	81
Male	15	0.2083	38	0.5278	19	0.2639	72
Total	44	0.2340	107	0.5692	37	0.1968	153

In addition to the treatment effects, we also checked the presence of possible gender differences in the choice of the three mortgage repayment options. In Table 6, we present the frequency table for the choice of the three mortgage repayment plans according to gender.

Table 6 clearly shows that while the share of the choice of Option A among male and female students are roughly the same, the share of female students who chose Option B (Option C) was significantly more (less) than that of the male students. The choices of the three options among female and male students differ significantly from each other according to a Pearson χ^2 test ($p = 0.043$). Once more, this difference across genders can be attributed to less risk-taking tendencies of women (see, e.g., Croson and Gneezy, 2009).

In addition to the statistical analysis we conducted, we also ran a set of multinomial logistic regressions in order to find out the factors that significantly affect the likelihood of choosing each of the variable interest rates. The results are reported in Table 7.

Table 7: Multinomial logit regression for mortgage plan choice[a]

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Option B	*Demographics*							
	Age		-0.214**	-0.214**	-0.211**	-0.271***	-0.275***	-0.272***
			(0.089)	(0.089)	(0.091)	(0.101)	(0.102)	(0.102)
	Female	0.237	0.067	0.068	-0.019	0.562	0.439	0.453
		(0.417)	(0.516)	(0.522)	(0.578)	(0.600)	(0.622)	(0.626)
	Years lived independent		0.457*	0.458*	0.488*	0.571**	0.602**	0.604**
			(0.247)	(0.248)	(0.262)	(0.288)	(0.298)	(0.297)
	Has children		✓	✓	✓	✓	✓	✓
	Lives with someone[b]		✓	✓	✓	✓	✓	✓
	Socioeconomic status		✓	✓	✓	✓	✓	✓
	Prior financial edu.[c]				✓	✓	✓	✓
	Treatment	-0.064		0.009	0.045	0.022		0.170
		(0.417)		(0.530)	(0.586)	(0.578)		(0.624)
	Test score				-0.031		-0.065	-0.075
					(0.112)		(0.110)	(0.118)
	Risk attitudes							
	Willingness to take risks					0.567***	0.584***	0.585***
						(0.179)	(0.181)	(0.182)
	Amount invested[d]	0.020						0.062
		(0.134)						(0.186)
Option C	*Demographics*							
	Age		-0.453*	-0.456*	-0.540**	-0.585**	-0.605**	-0.622**
			(0.233)	(0.233)	(0.254)	(0.254)	(0.257)	(0.266)
	Female	-0.906*	-0.948	-0.963	-1.311*	-0.756	-1.038	-1.033
		(0.544)	(0.627)	(0.633)	(0.735)	(0.706)	(0.755)	(0.761)
	Years lived independent		0.553*	0.551*	0.661**	0.732**	0.793**	0.818**
			(0.310)	(0.311)	(0.337)	(0.343)	(0.353)	(0.358)
	Has children		✓	✓	✓	✓	✓	✓
	Lives with someone[b]		✓	✓	✓	✓	✓	✓
	Socioeconomic status		✓	✓	✓	✓	✓	✓
	Prior financial edu.[d]				✓	✓	✓	✓
	Treatment	-0.246		-0.115	0.215	-0.095		0.292
		(0.531)		(0.620)	(0.723)	(0.665)		(0.744)
	Test score				-0.120		-0.140	-0.158
					(0.139)		(0.128)	(0.141)
	Risk attitudes							
	Willingness to take risks					0.331	0.357*	0.362*
						(0.210)	(0.213)	(0.213)
	Amount invested[e]	0.025						0.107
		(0.170)						(0.226)
	Observations	153	128	128	128	128	128	128
	Prob > χ^2	0.355	0.248	0.350	0.264	0.037	0.029	0.072

[a] Dependent variable is "Mortgage plan choice." Base outcome is Option A. *, **, *** denote, respectively, 10%, 5% and 1% significance levels. Standard errors are provided in parantheses. [b] Categories: "alone" (base), "with partner / spouse," "with friend / roommate." "Refused to answer" is included but not reported. [c] Variables: "no prior financial education," "money talked in childhood." [d] Amount invested in the first round of the risky investment task.

The regressions confirm the statistical results: The coefficient estimate of the *treatment* indicator is not significant. *Test score* doesn't have a significant impact on mortgage plan choices either. We report that higher *willingness to take risks* in general significantly increases the likelihood of the choice of the mortgage plan with low interest rate volatility (i.e, Option B) with respect to the mortgage plan with constant interest rate (i.e., Option A). Whereas the likelihood of the choice of variable interest mortgage plans significantly decreases by age, living independently for a longer time significantly increases it. Moreover, the coefficient estimate of the gender indicator suggests that female students as compared to male students were less likely to choose the mortgage plan with high interest rate volatility (i.e, Option C). However, this coefficient estimate is only weakly significant in two of the seven regression models.

Intially, we thought that the ineffectiveness of the treatment for this task can be explained by the gender imbalance that we pointed out earlier: We have already shown above that more female students chose the less risky option (B) than male students did. Combined with the fact that there were significantly more female students in the control group than in the treatment group, we expected that the gender imbalance might be the reason for the ineffectiveness of the treatment condition in this task. Despite that we control for gender, the regressions we ran show that the treatment had no effect on the mortgage plan choice. Hence, the regressions do not support the conjecture that the ineffectiveness of the treatment is due to gender imbalance.

5.4 Portfolio task. As Charness et al. (2020) do, we also take the expected value of portfolios as the measure that summarizes participants' portfolio decisions. The expected value of participants' portfolios were on average 51.58€ (*std. dev.* = 0.44) and the standard deviation of their portfolios were on average 5.51€ (*std. dev.* = 2.23). The relative frequency distribution of the expected value of participants' portfolio choices can be seen in Figure 7. As before, we binned the data in 0.2 intervals in the figure.

Unlike the risky investment task, we did not observe any significant treatment effect for this task. That is to say, the expected value of the portfolios did not significantly differ on average in the two groups: The mean of the expected value of the portfolios was 51.59 (*std. dev.* = 0.45) for participants in the control group and 51.57 (*std. dev.* = 0.43) for those in the treatment group. The difference between the two groups in the expected values of the portfolios was not significant according to a *t*-test ($p = 0.7700$).

We also studied the standard deviations of the portfolios of the participants in the two groups. The mean of the standard deviation of the portfolios was 5.58 (*std. dev.* = 2.31) for participants in the control group and 5.44 (*std. dev.* = 2.16) for those in the treatment group. The difference between

the two groups in the standard deviations of the portfolios did not reach statistical significance either ($p = 0.6825$ according to a t-test).
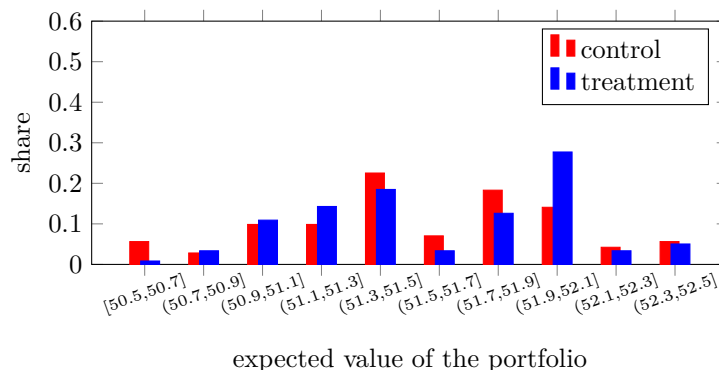

Figure 7: Distribution of expected value of participants' portfolios

To understand better the findings above, we take a look at possible gender difference in the expected value of the portfolios of the female and male students. The distribution of the expected value of the portfolios of the female and male students is depicted in Figure 8.
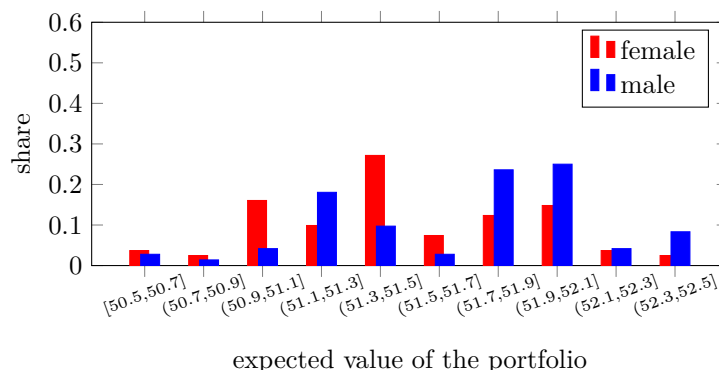

Figure 8: Distribution of expected value of participants' portfolios by gender

The expected value of the portfolios of the female students (*mean* = 51.50€, *std. dev.* = 0.43) were on average lower than that of the male students (*mean* = 51.71€, *std. dev.* = 0.43). This difference is statistically significant according to a t-test ($p = 0.0013$). We conjectured that this finding may explain why we did not find any significant treatment effects in this task: Given that the share of female students were higher in the control group than that in the treatment group, the mean of the expected value of portfolios in the control group may appear to be lower than expected. In turn, the difference in the expected value of portfolios in the control and treatment groups may turn out to be negligible. To test whether this conjecture holds, we controlled for gender in our regressions.

Table 8: OLS regression for the expected value of the portfolio in the portfolio task[a]

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Demographics							
Age		-0.010	-0.010	-0.011	-0.011	-0.011	-0.013
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Female	-0.197***	-0.196**	-0.201**	-0.184**	-0.193**	-0.178**	-0.158*
	(0.070)	(0.078)	(0.079)	(0.087)	(0.085)	(0.090)	(0.087)
Years lived independent		0.008	0.007	0.006	0.008	0.008	0.015
		(0.027)	(0.027)	(0.028)	(0.028)	(0.027)	(0.027)
Has children		-0.013	0.021	0.043	0.049	0.006	-0.040
		(0.309)	(0.319)	(0.336)	(0.337)	(0.330)	(0.329)
Lives with someone							
Lives with partner / spouse[b]		0.063	0.060	0.055	0.061	0.067	0.056
		(0.108)	(0.108)	(0.112)	(0.116)	(0.116)	(0.113)
Lives with friend / roommate[b]		0.011	0.009	0.004	0.003	0.005	-0.032
		(0.119)	(0.120)	(0.122)	(0.122)	(0.122)	(0.120)
Socioeconomic status							
SES childhood		-0.037	-0.036	-0.036	-0.038	-0.038	-0.032
		(0.042)	(0.042)	(0.043)	(0.043)	(0.043)	(0.042)
SES current		0.009	0.009	0.009	0.010	0.008	0.000
		(0.047)	(0.047)	(0.048)	(0.048)	(0.048)	(0.047)
SES future		0.017	0.015	0.005	0.010	0.010	0.006
		(0.034)	(0.034)	(0.037)	(0.036)	(0.036)	(0.036)
Prior financial education							
No prior fin. edu.				-0.011	-0.009	-0.013	0.002
				(0.093)	(0.093)	(0.093)	(0.091)
Money talked in childhood: 1[c]				0.055	0.066	0.062	0.023
				(0.145)	(0.146)	(0.146)	(0.143)
Money talked in childhood: 2[c]				0.016	0.030	0.030	-0.033
				(0.131)	(0.136)	(0.136)	(0.134)
Treatment	-0.037		-0.037	-0.058	-0.037		-0.029
	(0.071)		(0.080)	(0.090)	(0.082)		(0.088)
Test score				0.010		0.005	0.013
				(0.017)		(0.016)	(0.017)
Risk attitudes							
Willingness to take risk					0.008	0.008	0.008
					(0.026)	(0.026)	(0.025)
Amount invested[d]	0.060***						0.073***
	(0.023)						(0.025)
Observations	153	128	128	128	128	128	128
Prob > F	0.062	0.414	0.487	0.758	0.773	0.782	0.304
R^2	0.131	0.082	0.083	0.088	0.086	0.086	0.153

[a] Dependent variable is "Insurance spending." *, **, *** denote, respectively, 10%, 5% and 1% significance levels. Standard errors are provided in parantheses. A constant is included but not reported here. Also, controls for the day of participation in the experiment is included in the first regression model but not reported. [b] Base category is "alone." "Refused to answer" is included but not reported. [c] Categories: "1: often," "2: sometimes," "3: hardly ever" (base). [d] Amount invested in the first round of the risky investment task.

Moreover, OLS regressions reported in Table 8 confirm our findings above. That is, *treatment* didn't have a significant effect on the expected value of the stock portfolios chosen by the participants in the experiment. Results in Table 8 also show that *test score* doesn't predict the expected value of the stock portfolios either. Not surprisingly, behavior in the investment task significantly explains the portfolio choices in the portfolio task. That is to say, the coefficient estimate of the *amount invested* (in the investment task) is positive and highly significant. We also note that the R^2 statistics are quite low for all but one regression model. Accordingly, the *p*-values for the F-test are quite high for the coefficient estimates in all but one regression model.

As in Charness et al. (2020), the available stocks in the portfolio task were increasing in expected value and also in their payoff variances. Thus, portfolios with lower expected value imply higher risk aversion. Female participants chose portfolios that had significantly lower expected values than those of male participants, which corroborates the earlier findings on gender differences in risk taking (see, e.g., Croson and Gneezy, 2009). However, this does not in itself explain the insignificant coefficient estimates of the *treatment* variable on the expected value of the portfolios, as we also control for gender in our regressions.

6 Discussion and concluding remarks

Anecdotal evidence suggests that growing use of financial technologies has increased risk taking among young adults. Apparently, this calls for incorporating responsible risk taking within the contexts of investment, insurance and long-term borrowing in financial literacy courses. Despite its growing importance, there is very limited research that investigates whether such a course would be effective in changing the risk attitudes of young individuals towards financial risk.

In this paper, using four different experimental tasks, we tested whether a financial literacy course offered to freshmen students could change their attitudes towards financial risk in investment, insurance and borrowing contexts. We found limited evidence for the effect of the financial literacy course that we offered to those in the treatment group on risk taking behavior: The treatment significantly decreased the average expenditure on insurance in the insurance task, which was contrary to our expectations. Moreover, we did not observe significant treatment effects on risk taking behavior in other tasks.

We suspected that a few factors might have caused why we observed (*i*) a significant decrease in insurance spending due to the treatment, and (*ii*) no significant treatment effects in the risky investment, mortgage and portfolio tasks: In Table 1, it is clearly seen that the share of female students in the control group is significantly higher than that in the treatment group. Table 2 shows

that this gender imbalance carries over to the reduced sample after merging the three data sets we collected.

As we noted earlier, despite that the experiment was part of the intervention, we were not able to render it mandatory for students attending the two courses we offered within the intervention. As is seen in Table 1, there was less participation in the experiment from the intervention control group than from the treatment group. It might be that those in the control group didn't associate the experiment with their course and hence felt that the experiment is not relevant to them. Also, different instructors managed the two courses offered to the control and treatment groups. As a result, those in the control group might have not felt like making a favor to the instructors of the treatment course by participating in the experiment. We believe that these motivations were more pronounced among male students in the control group, as numerous experiments show men to be less other-regarding than women (see, e.g, Eckel and Grossman, 1998; Croson and Gneezy, 2009).

Moreover, studies show that women are more risk averse than men (see, e.g., Croson and Gneezy, 2009) and the decisions in our tasks involved risk. We also show in Section 5 that compared to male students, female students made more risk averse decisions in the insurance, mortgage and portfolio tasks. This implies that the excess female students in the control group might have offset the average risk taking behavior expected to be significantly higher in the control group than in the treatment group. As a result, students' decisions in the control and treatment groups in these tasks might have turned out to be on average similar in terms of risk aversion.

Consequently, we expected that the imbalance in the share of female participants between control and treatment groups can explain the null results we obtained. Therefore, we controlled for gender in our regressions to test whether our conjecture about the consenquences of the gender imbalance. Yet, the coefficient estimates of the *treatment* variable were not significant, which leads us to dismiss gender imbalance as a potential explanation for the null results we obtained.

The issue of control and treatment groups significantly differing in the share of female students can also originate from self-selection and attrition in our intervention. As we mentioned in the description of the intervention design, we were not able to restrict registration to and drop-out from the courses that we offered within the intervention. That is to say, participation was partially on a self-selection based. Particularly, we did not aim to recruit non-freshman students for our intervention. To avoid this, we restricted our sample to only freshman and business / economics students.

Moreover, we included in our sample even those students who did not complete the financial literacy course or those who completed the course after taking the financial literacy test and participating in our experiment. We believe that this dampened the mitigating effect of the treatment on

risk taking in all of the tasks in our experiment. In regressions that we did not report in this paper, we observed improved regression results in the investment task when we excluded those who did not complete the financial literacy course.[16] That said, statistical significance of the coefficient estimate of the treatment variable remains an issue. Despite this, we believe that attendance is important for the effectivity of financial literacy courses (see, e.g., Meier and Sprenger, 2013).

Lastly, we found that insurance intake was lower in the treatment group. We believe that this may be explained with thriftiness: The content of the finance course that we offered might have instilled thrifty behavior in the participants in the treatment group. Participants in this group might have thought that it is unnecessary to overinsure themselves. This may have reduced their insurance demand. Also, our finding is in accord with recent findings in the literature. More specifically, research by Hermansson and Jonsson (2021) and Eling, Ghavibazoo, Hanewald (2021) suggests that people who took a financial literacy course to improve their financial literacy may have less insurance uptake.

Despite the shortcomings, our study suggests that there are potential benefits in offering a financial literacy course that provides basic information on financial markets and different financial assets. In particular, we believe that a course along these lines can mitigate the problem of excessive risk taking in financial markets among young adults. We also note that the financial literacy course that we offered to students in the treatment group was neutral towards financial risks in order to avoid experimenter demand effects. In practical applications, the content of such a course can further be coupled with a guidance on responsible risk taking in a variety of financial contexts. We believe that further research is needed to draw more definitive conclusions.

References

Alan, S., Ertac, S. (2018). Fostering patience in the classroom: Results from randomized educational intervention. *Journal of Political Economy*, 126(5), 1865–1911.

Black, S. E., Devereux, P. J., Lundborg, P., Majlesi, K. (2018). Learning to take risks? The effect of education on risk-taking in financial markets. *Review of Finance*, 22(3), 951–975.

Bover, O., Hospido, L., Villanueva, E. (2018). The impact of high school financial education on financial knowledge and choices: Evidence from a randomized trial in Spain. Mimeo, Banco de España.

Brown, J. R., Kling, J. R., Mullainathan, S., Wrobel, M. V. (2008). Why don't people insure late-life consumption? A framing explanation of the under-annuitization puzzle. *American Economic Review*, 98(2), 304–09.

Bruhn, M., de Souza Leão, L., Legovini, A., Marchetti, R., Zia, B. (2013). The impact of high school financial education: Experimental evidence from Brazil. *World Bank Policy Research Working Paper Series*, WP. No: 6723.

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[16]These regression outputs are available upon request.

Bucks, B., Pence, K. (2008). Do borrowers know their mortgage terms? *Journal of Urban Economics*, 64(2), 218–233.

Cameron, L., Shah, M. (2015). Risk-taking behavior in the wake of natural disasters. *Journal of Human Resources*, 50(2), 484–515.

Campbell, J. Y. (2006). Household finance. *Journal of Finance*, 61(4), 1553–1604.

Charness, G., Garcia, T., Offerman, T., Villeval, M. C. (2020). Do measures of risk attitude in the laboratory predict behavior under risk in and outside of the laboratory? *Journal of Risk and Uncertainty*, 60(2), 99–123.

Chen, D. L., Schonger, M., Wickens, C. (2016). oTree?An open-source platform for laboratory, online, and field experiments. Journal of Behavioral and Experimental Finance, 9, 88–97.

Cicchetti, C. J., Dubin, J. A. (1994). A microeconometric analysis of risk aversion and the decision to self-insure. *Journal of Political Economy*, 102(1), 169–186.

Croson, R., Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, 47(2), 448–74.

De Donder, P., Leroux, M. L. (2013). Behavioral biases and long-term care insurance: a political economy approach. *BE Journal of Economic Analysis and Policy*, 14(2), 551–575.

Do Hwang, I. (2021). Prospect theory and insurance demand: empirical evidence on the role of loss aversion. *Journal of Behavioral and Experimental Economics*, 95, 101764.

Eckel, C. C., Grossman, P. J. (1998). Are women less selfish than men?: Evidence from dictator experiments. *Economic Journal*, 108(448), 726–735.

Eling, M., Ghavibazoo, O., Hanewald, K. (2021). Willingness to take financial risks and insurance holdings: A European survey. *Journal of Behavioral and Experimental Economics*, 95, 101781.

Gathergood, J., Weber, J. (2017a). Financial literacy: A barrier to home ownership for the young? *Journal of Urban Economics*, 99, 62–78.

Gathergood, J., Weber, J. (2017b). Financial literacy, present bias and alternative mortgage products. *Journal of Banking and Finance*, 78, 58–83.

Gneezy, U., Potters, J. (1997). An experiment on risk taking and evaluation periods. *Quarterly Journal of Economics*, 112(2), 631–645.

Griskevicius, V., Tybur, J. M., Delton, A. W., Robertson, T. E. (2011). The influence of mortality and socioeconomic status on risk and delayed rewards: a life history theory approach. *Journal of Personality and Social Psychology*, 100(6), 1015.

Haurin, D. R., Morrow-Jones, H. A. (2006). The impact of real estate market knowledge on tenure choice: A comparison of black and white households. *Housing Policy Debate*, 17(4), 625–653.

Hermansson, C., Jonsson, S. (2021). The impact of financial literacy and financial interest on risk tolerance. *Journal of Behavioral and Experimental Finance*, 29, 100450.

Hsee, C. K., Kunreuther, H. C. (2000). The affection effect in insurance decisions. *Journal of Risk and Uncertainty*, 20(2), 141–159.

Hussain, S., Sherman N. (2020). *Newbie investors: 'I didn't know I'd lose money so fast.'* BBC. https://www.bbc.com/news/business-53201204

Klebnikov, S., Gara, A. (2020). *20-year-old Robinhood customer dies by suicide after seeing a $730,000 negative balance.* Forbes. https://www.forbes.com/sites/sergeiklebnikov/2020/06/17/20-year-old-robinhood-customer-dies-by-suicide-after-seeing-a-730000-negative-balance/?sh=346384c16384

Kunreuther, H., Pauly, M. (2004). Neglecting disaster: Why don't people insure against large losses? *Journal of Risk and Uncertainty*, 28(1), 5–21.

Kunreuther, H. C., Pauly, M. V., McMorrow, S. (2013). *Insurance and behavioral economics: Improving decisions in the most misunderstood industry.* Cambridge University Press, Cambridge, UK.

Liao, L., Xiao, J. J., Zhang, W., Zhou, C. (2017). Financial literacy and risky asset holdings: evidence from China. *Accounting and Finance*, 57(5), 1383–1415.

Lin, X., Bruhn, A., William, J. (2019). Extending financial literacy to insurance literacy: a survey approach. *Accounting and Finance*, 59, 685–713.

Lusardi, A., Mitchell, O. S. (2008). Planning and financial literacy: How do women fare? *American Economic Review*, 98(2), 413–17.

Lusardi, A., Mitchell, O. S. (2014). The economic importance of financial literacy: theory and evidence. *Journal of Economic Literature*, 52(1), 5–44.

Lusardi, A., Mitchell, O. S., Curto, V. (2010). Financial literacy among the young. *Journal of Consumer Affairs*, 44(2), 358–380.

Lührmann, M., Serra-Garcia, M., Winter, J. (2018). The impact of financial education on adolescents' intertemporal choices. *American Economic Journal: Economic Policy*, 10(3), 309–332.

Malmendier, U., Nagel, S. (2011). Depression babies: do macroeconomic experiences affect risk taking? *Quarterly Journal of Economics*, 126(1), 373–416.

Meier, S., Sprenger, C. D. (2013). Discounting financial literacy: Time preferences and participation in financial education programs. *Journal of Economic Behavior and Organization*, 95, 159–174.

Oberrauch, L., Kaiser, T. (2020). Financial literacy and intertemporal arbitrage. Mimeo, University of Koblenz-Landau.

Pitthan, F., De Witte, K. (2021). Puzzles of insurance demand and its biases: A survey on the role of behavioural biases and financial literacy on insurance demand. *Journal of Behavioral and Experimental Finance*, 30, 100471.

Prast, H., Rossi, M., Torricelli, C., Sansone, D. (2015). Do women prefer pink? The effect of a gender stereotypical stock portfolio on investing decisions. *Politica Economica*, 31(3), 377–420.

Schildberg-Hörisch, H. (2018). Are risk preferences stable? *Journal of Economic Perspectives*, 32(2), 135–54.

Schmidt, U. (2016). Insurance demand under prospect theory: A graphical analysis. *Journal of Risk and Insurance*, 83(1), 77–89.

Simonsohn, U., Karlsson, N., Loewenstein, G., Ariely, D. (2008). The tree of experience in the forest of information: Overweighing experienced relative to observed information. *Games and Economic Behavior*, 62(1), 263–286.

Stigler, G. J., Becker, G. S. (1977). De gustibus non est disputandum. *American Economic Review*, 67(2), 76–90.

Sutter, M., Weyland, M., Untertrifaller, A., Froitzheim, M. (2020). Financial literacy, risk and time preferences2013Results from a randomized educational intervention. Mimeo, MPI Collective Goods Discussion Paper.

Sydnor, J. (2010). (Over)insuring modest risks. *American Economic Journal: Applied Economics*, 2(4), 177–99.

Urban, C., Schmeiser, M., Collins, J. M., Brown, A. (2020). The effects of high school personal financial education policies on financial behavior. *Economics of Education Review*, 78, 101786.

Van Rooij, M., Lusardi, A., Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101(2), 449–472.

Wagner, G. G., Burkhauser, R. V., Behringer, F. (1993). The English language public use file of the German Socio-Economic Panel. *Journal of Human Resources*, 429–433.

Weedige, S. S., Ouyang, H., Gao, Y., Liu, Y. (2019). Decision making in personal insurance: Impact of insurance literacy. *Sustainability*, 11(23), 6795.

Yin, H., Chen, J., Kunreuther, H., Michel-Kerjan, E. (2016). Availability Heuristic and Gambler's Fallacy over Time in a Natural Disaster Insurance Choice Setting. Mimeo, Shanghai Jiao Tong University.

Zarroli, J. (2020). *Millions Turn To Stock Trading During Pandemic, But Some See Trouble For The Young.* NPR. https://www.npr.org/2020/08/11/895054084/millions-turn-to-stock-trading-during-pandemic-but-some-see-trouble-for-the-youn?t=1644914131093

Appendix

In this section, we provide the screenshots of general instructions and the instructions for each task we used in the experiment, and the translations of the instructions and decision screens made by the authors themselves. In the translations, the authors' comments are shown in italics in square brackets. We skipped two screens that included a number of questions. In one of these screens, there were questions that intended to test whether students understood the instructions. In the other screen, we asked students a question about which of the two courses we offered within our intervention they took. At the end of this section, we also provide a table of summary statistics for the variables we used in regressions.

Info ja suostumus

Osallistuminen tähän tutkimukseen on vapaaehtoista. Sinun tulee olla vähintään 18-vuotias osallistuaksesi.

Tehtäväkuvaus

Sinulle annetaan seuraavat neljä valintatehtävää oikeilla rahapanoksilla:

- Investointitehtävä.
- Vakuutustehtävä.
- Lainatehtävä.
- Arvopaperisijoitustehtävä.

Vastaat vielä muutamaan kysymykseen.

Maksu

Osallistuttuasi tähän tutkimukseen saat **5,00 € suuruisen palkkion osallistumisestasi**.

Osallistumispalkkion lisäksi sinulla on **mahdollisuus ansaita jopa 15,00 €** yhdestä neljästä tehtävästä.

Tämän tutkimuksen lopussa saat lisätietoja siitä, kuinka ja miten saat maksusi.

Yksityisyys

Valintasi tallennetaan luottamuksellisesti vain tätä tutkimusta varten. Muut osallistujat tai kolmannet osapuolet eivät näe valintojasi tai sitä, kuinka paljon ansaitsit testillä. Lisäksi sinä et näe muiden valintoja tai heidän testissä ansaitsemiaan tuloja.

Testin jälkeen vastauksesi säilytetään anonymisoituina ja vain tutkimustarkoituksiin.

Korvauksesi suoritetaan myös luottamuksellisesti.

Voit vetäytyä tutkimuksesta milloin tahansa ilman erillistä syytä. Muistutamme kuitenkin, että silloin et voi saada osallistumispalkkiota ja potentiaalisia tuloja tehtävistä, jollet suorita kyselyä loppuun.

☐ Olen lukenut ja ymmärtänyt yllämainitut tiedot kyselyyn liittyen ja hyväksyn yllämainitut kyselyn käyttöehdot.

☐ Vahvistan olevani vähintään 18-vuotias.

Jos olet lukenut kyselyn tiedot ja ohjeet ja hyväksynyt käyttöehdot, voit jatkaa kyselyyn.

Seuraava

Appendix A1: Translation of information and consent

Information and consent

Participation in this study is voluntary. To be able to participate, you must be at least 18 years old.

Description of the tasks

You will be given the following four choice tasks with real money stakes:

- Risky investment task.

- Insurance task.

- Loan task.

- Portfolio task.

In addition to these, you will also answer a few more questions.

Payment

After participating in this study, you will receive a 5.00€ reward for your participation.

In addition to the participation fee, you have the opportunity to earn up to 15.00€ for one of the four tasks.

At the end of this study, you will learn more about where and how you will receive your payment.

Privacy

The choices you make during this study will be stored confidentially. Other participants or third parties will not know your choices or how much you earned from the study. In addition, you will not be able to see the choices or the earnings of other people participating in this study.

After the study, your answers will be kept anonymous and for research purposes only.

Your compensation will also be carried out confidentially.

You can withdraw from the study at any time without giving a reason. However, we remind you that if you withdraw, you will not be able to receive the participation fee and potential income from the tasks if you do not complete the study.

☐ I have read and understood all the information about the study provided above and I accept the terms of use of the study stated above.

☐ I confirm that I am at least 18 years old.

If you have read the information and instructions about this study and accepted the terms of use, you can continue with the study.

Next

Yleisohjeistus

Yleisohjeistus

- **Luethan jokaisen tehtävän ohjeistuksen huolellisesti ja ajatuksella**. Muussa tapauksessa saattaa olla, ettet saa niin hyvää loppusummaa maksuksesi, kuin mitä olisit voinut saada.
- Ottaen huomioon, että suoritat eksperimentin etänä, saattavat päätöksentekoosi vaikuttaa ulkopuolisten mielipiteet. Tätä emme tahdo. **Eksperimentin tarkoituksena on, että päätöksesi ovat sinun omiasi, eivät kenenkään muun**. Teethän siis jokaisen päätöksen itsenäisesti.
- Eksperimentissä on neljä tehtävää, joista kahdessa on useampi kierros. Kierroksilla tarkoitetaan sitä, että teet saman tehtävän useamman kerran.
- **Maksuksi valikoituu satunnaisesti yksi neljästä tehtävästä**. Jos valitussa tehtävässä on useampi kierros, maksuksi valikoituu satunnaisesti yksi tehtävän kierroksista. Saat maksuksi sen summan, jonka ansaitsit sillä kierroksella.
- Koska jokaisella tehtävällä ja kierroksella on yhtä suuri todennäköisyys tulla valituksi maksua varten, **paras lähestymistapasi kuhunkin päätökseen on vastata siihen tehtäväkohtaisten ohjeiden mukaisesti, ikään kuin maksusi tulisi kyseisestä päätöksestä**.
- Vaasan yliopiston hallinto suorittaa maksut. Saat tiedot maksuprosessista myöhemmin.

Tekninen ohjeistus

- Vaikka kaikki laitteet, joissa on selain, internetyhteys ja näppäimistö riittävät, suosittelemme, että suoritat tehtävän tietokoneella.
- Kun olet tehnyt päätöksesi ja painat SEURAAVA-painiketta, **et voi enää palata edelliselle sivulle ja muuttaa päätöstäsi**. TAKAISIN ja PÄIVITÄ-painikkeet eivät ole käytössä, joten ethän käytä niitä.
- Kirjoita opiskelijanumerosi huolellisesti ILMAN ensimmäistä kirjainta. Opiskelijanumerot ovat yleensä kuusinumeroisia ensimmäistä kirjainta lukuunottamatta. Jos opiskelijanumerosi on lyhyempi niin lisää 0 (nolla) opiskelijanumerosi alkuun. Jos opiskelijanumerosi on pidempi kuin kuusi numeroa ilman ensimmäistä kirjainta, niin kirjoita vain ensimmäiset kuusi numeroa.

Seuraava

Appendix B1: General instructions

General instructions

- Please read the instructions for each task carefully and thoughtfully. Otherwise, you may not get as good a final payment as you could have.

- Considering that you are participating in this study remotely, your decision-making may be influenced by the opinions of outsiders. This is not what we want. The point of the study is that you make decisions on your own, not with someone else. So you make every decision independently.

- There are four tasks in the study, two of which have several rounds. Rounds mean that you do the same task several times.

- One of the four tasks is randomly selected as payment. If the selected task has more than one round, one of the rounds of the task is randomly selected as payment. You will be paid the amount you earned in that round.

- Since each task and round has an equal chance of being selected for payment, your best approach to each decision is to respond according to its task-specific instructions as if your payment will be from that decision.

- The administration of the University of Vaasa makes the payments. You will receive information about the payment process later.

Technical instructions

- Although you can use any device with a browser, internet connection and keyboard, we recommend that you complete the experiment on a computer.

- Once you have made your decision and click the NEXT button, you can no longer go back to the previous page and change your decision. The BACK and REFRESH buttons will not function, so please don't use them.

- Write your student number carefully WITHOUT the first letter. Student numbers are usually six digits without reading the first letter. If your student number is shorter, add 0 (zero) to the beginning of your student number. If your student number is longer than six digits without the first letter, please only enter the first six digits.

Next

Investointitehtävä: Ohjeet

Tehtäväkuvaus

Tämän tehtävän jokaisen kierroksen alussa saat alkupääomaksi 6,00 € , josta laitat haluamasi summan riskisijoitukseen.

(Huomioithan, että alkupääoma on erillinen summa 5,00 € suuruisesta osallistumispalkkiostasi.)

Voit sijoittaa summan välillä 0 € ja 6,00 €, mukaanlukien 0 € (ei investointia) ja 6,00 €.

Saat pitää sen summan alkupääomastasi, jota et investoinut.

Teet samat päätökset kahdella erillisellä kierroksella.

Riskisijoitus

On olemassa mahdollisuus, että riskisijoituksesi on tuottoisa. Saat tietää sijoituksesi menestymisen todennäköisyyden kunkin kierroksen alussa. Jos sijoituksesi on tuottoisa, saat 2,5 kertaisesti sijoittamasi summan. Jos sijoutuksesi epäonnistuu, häviät sijoittamasi summan.

Tietokone päättää satunnaisesti sijoituksesi menestyksen.

Tuotot

Huomioithan, että investointitehtävän päätökset ovat joka kierroksella riippumattomia muista kierroksista. Ansiot eivät siis kerry kahden kierroksen ajalta. Jos tämä tehtävä valikoituu maksuksi, yksi kahdesta kierroksesta valikoituu satunnaisesti ja sinulle maksetaan sen kierroksen ansioiden mukaisesti.

Jos olet lukenut ohjeet, voit napsauttaa seuraavaa painiketta aloittaaksesi tehtävän.

Seuraava

Appendix C1: Translation of the instructions for the investment task

Investment Task: Instructions

Job description

At the beginning of each round of this task, you will receive an initial capital of 6.00€, from which you can put any amount you desire into a risky investment.

(Please note that the initial capital is a separate amount from your 5.00€ participation fee.)

You can invest an amount between 0€ and 6.00€, including 0€(no investment) and 6.00€.

You get to keep the amount of your initial capital that you didn't invest.

You will make similar decisions in two separate rounds.

Risky investment

There is a chance that your risky investment will be profitable. You will be informed of the success probability of your investment at the beginning of each round. If your investment is profitable, you will receive 2.5 times the amount you invested. If your investment fails, you lose the amount you invested.

The computer randomly determines the success of your investment.

Earnings

Please note that the decisions of the investment task in each round are independent of each round. Earnings for the two rounds are not going to be summed up. If this task is selected for payment, one of the two rounds will be randomly selected and you will be paid according to how much you earned in that round.

If you have read the instructions, you can click the next button to begin the task.

Next

Appendix C3: Investment task decision screen

Investointitehtävä: Kierros 1

Klikkaa tästä ja lue ohjeet vielä kerran.   −

Tehtäväkuvaus

Tämän tehtävän jokaisen kierroksen alussa saat alkupääomaksi 6,00 € , josta laitat haluamasi summan riskisijoitukseen.

(Huomioithan, että alkupääoma on erillinen summa 5,00 € suuruisesta osallistumispalkkiostasi.)

Voit sijoittaa summan välillä 0 € ja 6,00 €, mukaanlukien 0 € (ei investointia) ja 6,00 €.

Saat pitää sen summan alkupääomastasi, jota et investoinut.

Teet samat päätökset kahdella erillisellä kierroksella.

Riskisijoitus

On olemassa mahdollisuus, että riskisijoituksesi on tuottoisa. Saat tietää sijoituksesi menestymisen todennäköisyyden kunkin kierroksen alussa. Jos sijoituksesi on tuottoisa, saat 2,5 kertaisesti sijoittamasi summan. Jos sijoutuksesi epäonnistuu, häviät sijoittamasi summan.

Tietokone päättää satunnaisesti sijoituksesi menestyksen.

Tuotot

Huomioithan, että investointitehtävän päätökset ovat joka kierroksella riippumattomia muista kierroksista. Ansiot eivät siis kerry kahden kierroksen ajalta. Jos tämä tehtävä valikoituu maksuksi, yksi kahdesta kierroksesta valikoituu satunnaisesti ja sinulle maksetaan sen kierroksen ansioiden mukaisesti.

Sinulla on 6,00 € alkupääomaa tälle kierrokselle ja tästä summasta voit investoida riskisijoitukseen summan välillä 0 € ja 6,00 €, mukaan lukien 0 € (ei investointia) ja 6,00 €.

On olemassa **50% mahdollisuus**, että riskisijoituksesi on tuottoisa.

Klikkaa tästä tarkemmat selostukset 50% onnistumismahdollisuudelle.   −

Voit ajatella 50% onnistumismahdollisuutta kuin kolikonheittona: Jos heität kruunan, sijoituksesi onnistuu. Jos heität klaavan, sijoituksesi epäonnistuu.

Ole hyvä ja ilmoita haluamasi sijoitettava summa (muodossa "x,yz", tai jos pilkku ei toimi, käytä pistettä muodossa "x.yz", jossa x = € ja yz = sentit):

Seuraava

Appendix C4: Translation of the investment task decision screen[17]

Investment Task: Round 1

You have 6.00€ in initial capital for this round and from this amount, you can invest in a risk investment between 0€ and 6.00€ including 0€ (no investment) and 6.00€.

There is a 50% chance that your risky investment will be profitable.

Click here for a more detailed description of a 50% chance of success.   −

You can also think of 50% chance of success as a coin toss: If the coin toss turns out to be heads, your investment will be successful. If it turns out to be tails, your investment will fail.

Please indicate the amount you want to invest (in the form "x,yz", or if the comma does not work, use a dot in the form "x.yz" where x = € and yz = euro cents):

Next

---

[17]We only provide the screen for the first round. The only difference in the second round was the probability of success, which was given as 0.10.

Appendix D0: Insurance task

Vakuutustehtävä

Tässä tehtävässä saat alkupääomaksi 15,00 €. Saatat kuitenkin menettää saamasi summan.

Tarkemmin, jos tapahtuma Z tapahtuu, menetät koko saamasi 15 euron summan. On **10% mahdollisuus**, että tapahtuma Z tapahtuu.

Tietokone päättää satunnaisesti, tapahtuuko tapahtuma Z vai ei.

Napsauta tätä saadaksesi tarkemman selityksen tapahtuman Z tapahtumisesta 10%:n todennäköisyydellä. −

Voit ajatella tapahtuman Z tapahtumisen 10%:n todennäköisyydellä samalla tavalla kuin poimisit yhden pallon astiasta, jossa on 10 palloa numeroituina 1:stä 10:neen: Jos valitsemasi pallon numero on 1, tapahtuu tapahtuma Z ja häviät 15,00 €. Jos taas valitsemasi pallon numero on 2,3,4,5,6,7,8, 9, tai 10, tapahtumaa Z ei tapahdu ja saat pitää 15,00 €.

Voit kuitenkin vakuuttaa itsesi tätä riskiä vastaan.

Sinulla on 15,00 €, josta voit ostaa vakuutuksen haluamaasi määrän aina 5 euroon asti, sisältäen 0 euroa (ei vakuutusta) ja 5,00 €.

Jos tapahtuma Z tapahtuu, saat ostamasi vakuutuksen määrän takaisin kolminkertaisena (×3). Jos tapahtumaa Z ei tapahdu, säilytät 15,00 € alkupääomassasi, josta vähennetään vakuutuksesta maksamasi summa.

	Tapahtuma Z tapahtuu	**Tapahtumaa Z ei tapahdu**
Et osta vakuutusta:	Menetät 15 euron alkupääoman kokonaisuudessaan.	Pidät 15 euron alkupääoman kokonaisuudessaan.
Ostat vakuutuksen:	Menetät sen, mitä 15 euron alkupääomastasi on jäljellä, mutta saat ostamasi vakuutuksen määrän takaisin kolminkertaisena (×3).	Säilytät 15 € alkupääomassasi, josta vähennetään vakuutuksesta maksamasi summa.

Ilmoita haluamasi summa, jolla ostat vakuutuksia (muodossa "x,yz", tai jos pilkku ei toimi, käytä pistettä muodossa "x.yz", jossa x = € ja yz = sentit):

[   ]

Seuraava

Appendix D1: Translation of the insurance task

Insurance Task

In this task, you get 15.00€ as an initial endowment. However, you may lose the amount you received. More precisely, if event Z occurs, you will lose the entire amount of 15€ you received. There is a 10% chance that event Z happens.

The computer randomly decides whether event Z will occur or not.

> Click here for a more detailed explanation of event Z occurring with a 10% probability.   −
>
> You can think of the occurrence of event Z with a 10% probability in the same way you would pick one ball from an urn with 10 balls numbered from 1 to 10: If the number of the ball you choose is 1, event Z will occur and you will lose the 15.00€. If, on the other hand, the number of the ball you selected is 2, 3, 4, 5, 6, 7, 8, 9, or 10, event Z will not occur and you will keep the 15.00€.

However, you can insure yourself against this risk.

From the 15.00€ you have, you can buy insurance up to 5€, including 0€ (no insurance) and 5.00€. If event Z occurs, you will get back triple ($\times 3$) the amount of insurance you purchased. If event Z does not occur, you will keep the 15.00€ minus the amount you paid for the insurance.

	Event Z occurs	Event Z doesn't occur
You don't buy insurance:	You will lose the entire initial capital of 15.00€.	You will keep the entire initial capital of 15.00€.
You buy insurance:	You will lose what is left of your initial capital of 15.00€, but you will get back triple ($\times 3$) the amount of insurance you bought.	You will keep the 15.00€ minus the amount you paid for the insurance.

Please indicate the amount of insurance (in the form "x,yz", or if the comma does not work, use a dot in the form "x.yz" where x = € and yz = euro cents):

Next

Lainatehtävä

Progressio: Kierros 1 / 1

Kuvittele seuraava skenaario: Sinun tarvitsee lainata 10,00 € joka on maksettava takaisin kymmenen "vuoden" jälkeen.

Saat joka vuosi tuloja 2,00 €, ja sinun on maksettava lainastasi korkoa.

Sinun on valittava yksi kolmesta markkinoilla saatavilla olevista korkotasovaihtoehdoista lainallesi.

Valitse suosikkivaihtoehtosi seuraavista kolmesta vaihtoehdosta:

- **Vaihtoehto A**: Maksat kiinteän koron. Lainasi korkotaso on 8% joka vuosi. Tarkemmin sanottuna 0,8 € (80 senttiä) vähennetään sinun 2,00 € tuloistasi joka vuosi.
- **Vaihtoehto B**: Maksat vuosittain vaihtuvan koron, joka vaihtelee hieman vuodesta toiseen. Ensimmäisenä vuonna lainasi korkotaso on 7%. Tarkemmin sanottuna 0,7 € (70 senttiä) korkomaksuja vähennetään ensimmäisen vuoden tuloistasi, jotka ovat 2,00 €. Seuraavina vuosina tämä taso saattaa vaihdella **aina 2%:iin (kaksi prosenttiyksikköön) asti alle tai yli edeltävän vuoden tason**. Esimerkiksi toisena vuonna korkotaso voi saada minkä tahansa arvon 5% ja 9% väliltä.
- **Vaihtoehto C**: Maksat vuosittain vaihtuvan koron, joka vaihtelee merkittävämmin vuodesta toiseen. Ensimmäisenä vuonna lainasi korkotaso on 6%. Tarkemmin sanottuna 0,6 € (60 senttiä) korkomaksuja vähennetään ensimmäisen vuoden tuloistasi, jotka ovat 2,00 €. Seuraavina vuosina tämä taso saattaa vaihdella **aina 4%:iin (neljä prosenttiyksikköön) asti alle tai yli edeltävän vuoden tason**. Esimerkiksi toisena vuonna korkotaso voi saada minkä tahansa arvon 2% ja 10% väliltä.

Seuraava kuvio näyttää, kuinka korkotasot ovat kehittyneet viimeisen 100 vuoden aikana (tänä vuonna olet vuodessa 100). **Oranssi viiva** vastaa **optiota A**, **keltainen viiva optiota B**, ja **vihreä viiva optiota C**. Tarkastele kuviota ennen kuin teet valintasi. (Kuvio on interaktiivinen. Voit lisätä tai poistaa, minkä tahansa vaihtoehdon klikkaamalla vastaavaa selitystä kuvion yläpuolella.)

Kolmen vaihtoehdon korkotasot viimeisen 100 vuoden aikana

A: Ei riskiä B: Keskiverto riski C: Korkea riski
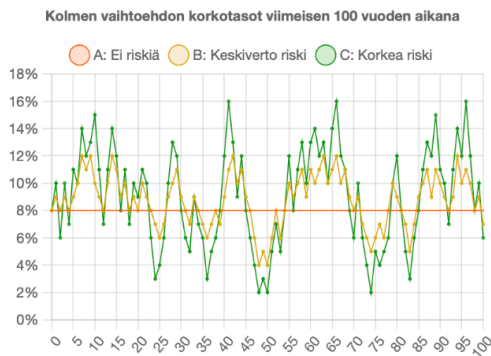
Tämän testin lopussa, jos tämä tehtävä valikoituu maksuun, ansaitset kymmenen vuoden aikana kertyneet kokonaissäästösi, joka on säästöjesi summa kaikilta vuosilta. Yhden vuoden säästö on aina 2,00 € miinus kunkin vuoden korko.

Valitse korkotasovaihtoehto lainallesi:

○ Vaihtoehto A: 8% kiinteä korko.

○ Vaihtoehto B: Vaihtuva korko: 7% ensimmäiselle vuodelle, ja seuraavin vuosina tämä taso voi vaihdella jopa kahteen prosenttiyksikköä alle tai yli edellisen vuoden tason.

○ Vaihtoehto C: Vaihtuva korko: 6% ensimmäiselle vuodelle, ja seuraavin vuosina tämä taso voi vaihdella jopa neljä prosenttiyksikköä alle tai yli edellisen vuoden tason.

Seuraava

Appendix E1: Translation of the mortgage task

Loan task

Imagine the following scenario: You need to borrow 10.00€ which must be repaid after ten "years".

You receive an income of 2.00€ every year, and you have to pay interest on your loan.

You have to choose one of the three interest rate plans available on the market for your loan.

Choose your favorite option from the following three options:

- Option A: You pay a fixed interest rate. The interest rate on your loan is 8% every year. More specifically, 0.8€ (80 cents) is deducted from your 2.00€ income every year.

- Option B: You pay an annual variable interest rate that varies slightly from year to year. In the first year, the interest rate on your loan is 7%. More specifically, 0.7€ (70 cents) in interest payments will be deducted from your first year's income, which is 2.00€. In the following years, this level may vary up to 2% (two percentage points) below or above the previous year's level. For example, in the second year, the interest rate can have any value between 5% and 9%.

- Option C: You pay an annual variable interest rate that varies more significantly from year to year. In the first year, the interest rate on your loan is 6%. More specifically, 0.6€ (60 cents) in interest payments will be deducted from your first year's income, which is 2.00€. In the following years, this level may vary up to 4% (four percentage points) below or above the previous year's level. For example, in the second year, the interest rate can have any value between 2% and 10%.

The following line chart shows how interest rates have developed over the last 100 years. (Let this year be 100). The orange line corresponds to option A, the yellow line to option B, and the green line to option C. Look at the pattern before making your choice. Please check the line chart before making your choice. (The line chart is interactive. You can add or remove any option by clicking on the corresponding explanation above the line chart.)

The interest rate for the three options over the last 100 years is as follows:
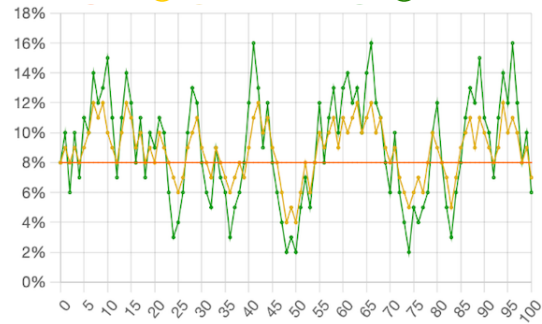
At the end of this test, if this task is selected for payment, you will earn your total savings accumulated over ten years, which is the sum of your savings for all years. One year's savings is always 2.00€ minus each year's interest.

Please choose an interest rate plan for your loan:

◯ Option A: 8% fixed interest rate.

◯ Option B: Variable interest: 7% for the first year, and in the following years this level can vary up to two percentage points below or above the previous year's level.

◯ Option C: Variable interest: 6% for the first year, and in the following years this level can vary up to four percentage points below or above the previous year's level.

Next

Arvopaperisijoitustehtävä: Ohjeet

Tehtäväkuvaus

Tämä tehtävä koostuu kahdesta kierroksesta. Kummankin kierroksen alussa saat tuloja 5,00 € ja alkupääomaa 50,00 €. Kummallakin kierroksella, käyttäen kaikkia käytettävissä olevia pääomiasi, sinua pyydetään ostamaan valitsemiesi yritysten arvopapereita annetusta luettelosta.

(Huomioithan, että alkupääoma ja tulo on erillinen summa 5,00 € suuruisesta osallistumispalkkiostasi.)

Osakekurssit riippuvat kahdesta mahdollisesta tapahtumasta (eli X ja Y), joilla on vaikutuksia rahoitusmarkkinoihin. On 50% mahdollisuus, että tapahtuma X tapahtuu ja 50% mahdollisuus, että tapahtuma Y tapahtuu. Nämä tapahtumat ovat toisensa poissulkevia; toisin sanoen ne eivät voi tapahtua samanaikaisesti. Tietokone määrittää satunnaisesti, kumpi näistä kahdesta tapahtumasta tapahtuu. Riippuen siitä, kumpi tapahtumista tapahtuu, osakkeiden hinta voi nousta tai laskea, kun taas joukkovelkakirjan hintaan ja korkomaksuun sille nämä tapahtumat eivät vaikuta.

Napsauta tästä saadaksesi tarkemman selityksen tapahtuman 50% todennäköisyydestä.	+

Voit ajatella 50% todennäköisyyttä tapahtumalle X ja 50% todennäköisyyttä tapahtumalle Y, mikä tapahtuu kolikonheiton seurauksena: Jos kolikonheitto osoittautuu kruunaksi, tapahtuu tapahtuma X. Jos kolikonheitto osoittautuu klaavaksi, tapahtuu tapahtuma Y.

Tuotot

Jos tämä tehtävä valitaan maksuksi, yksi kierroksista arvotaan satunnaisesti maksua varten. (Huomioithan, että investointitehtävän päätökset joka kierroksella ovat riippumattomia muista kierroksista. Ansiot eivät siis kerry 2 kierroksen ajalta.) Saat tulosi 5,00 € plus nettovoiton tai –tappion arvopaperisijoituksestasi. Toisin sanoen,

- Jos saat nettovoittoa osakesijoituksestasi, tämä voitto lisätään 5,00 € tuloihisi.
- Jos kuitenkin teet nettotappioita osakesijoituksestasi, tämä tappio vähennetään 5,00 € tuloistasi.

Huomaa, että jos tämä tehtävä valitaan maksuksi, et saa 50,00 € pääomaa tehtävän lopussa.

Jos olet lukenut ohjeet, voit napsauttaa seuraavaa painiketta aloittaaksesi tehtävän.

Seuraava

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Securities Investment Task: Instructions

Job description

This task consists of two rounds. At the beginning of both rounds, you will receive income of 5.00€ and initial capital of 50.00€. In each round, using all your available capital, you are asked to buy securities of companies of your choice from a given list.

(Please note that the initial capital and income are separate amounts from your 5.00€ participation fee.)

Stock prices depend on two possible events (i.e. X and Y) that have an impact on financial markets. There is a 50% chance that event X will occur and a 50% chance that event Y will occur. These events are mutually exclusive; in other words, they cannot occur simultaneously. The computer randomly determines which of these two events will occur. Depending on which of these events takes place, the price of the shares may rise or fall, while the price of the bond and the interest payment on it are not affected by these events.

Click here for a more detailed explanation of a 50% probability of an event. −

You can think of a 50% probability of event X and a 50% probability of event Y occurring as a result of a coin toss:: If the coin toss turns out to be heads, then event X occurs. If the coin toss turns out to be tails, then event Y occurs.

Revenues

If this mission is selected for payment, one of the rounds will be randomly drawn for payment. (Please note that the decisions of the investment task in each round are independent of each other. So earnings do not accumulate over the period of 2 rounds.) You will receive your income of 5.00€ plus net profit or loss from your stock investment. In other words,

If you get a net profit from your stock investment, this profit will be added to your 5.00€ income.

However, if you make net losses from your stock investment, this loss will be deducted from your 5.00€ income.

Please note that if this task is selected as payment, you will not receive the 50.00€ capital at the end of the task.

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[18]We only provide the translation of the first round of this task. As we have indicated in our paper, we excluded the second round of this task due to a typo in the Finnish translation, which could potentially affect participants' decisions.

If you have read the instructions, you can click the next button to start the task.

Next

Appendix F3: Portfolio task

Arvopaperisijoitustehtävä

Progressio: Kierros 1 / 2

Klikkaa tästä ja lue ohjeet vielä kerran.   +

Kuten ohjeista käy ilmi, sinulla on 5,00 € tuloja ja 50,00 € pääomaa sijoitettavaksi. Käytettävissäsi on kolme erilaista arvopaperia (kaksi osaketta ja joukkovelkakirja) sijoituksellesi. Tällä hetkellä kaikkien kolmen arvopaperin yksikköhinta on 1 €. Joukkovelkakirjan tuotto ja osakkeiden hinnanmuutos yhden vuoden aikana on seuraava:

YRITYS A:n joukkovelkakirja: Saat kiinteän 0,01 € tuoton jokaista tähän joukkovelkakirjaan tekemääsi yhden euron suuruista sijoitusta kohden riippumatta siitä, kumpi kahdesta tapahtumasta tapahtuu. Eli jokaista sijoittamaasi 1 € kohden saat 0,01 € tuottoa ottamatta riskiä.

YRITYS B:n osake: Jos tapahtuma X tapahtuu, osakekurssi nousee 1,12 euroon ja siten ansaitset 0,12 € jokaista yhden euron suuruista sijoitusta kohden. Jos tapahtuma Y tapahtuu, osakekurssi laskee 0,94 euroon ja siten menetät 0,06 € jokaista yhden euron suuruista sijoitusta kohden tähän osakkeeseen.

YRITYS C:n osake: Jos tapahtuma X tapahtuu, osakekurssi nousee 1,2 euroon ja siten ansaitset 0,20 € jokaista yhden euron suuruista sijoitusta kohden. Jos tapahtuma Y tapahtuu, osakekurssi laskee 0,9 euroon ja siten menetät 0,10 € jokaista yhden euron suuruista sijoitusta kohden tähän osakkeeseen.

Voit sijoittaa 50,00 € pääomaa yhteen yllä olevista arvopapereista, kahteen yllä olevista arvopapereista, tai kolmeen yllä olevista arvopapereista haluamallasi tavalla.

Alla on yhteenveto tuotoista tapahtumille X ja Y:

	TAPAHTUMA X TAPAHTUU			TAPAHTUMA Y TAPAHTUU	
	Ostohinta (osaketta kohden)	Hinta osaketta kohden yhtenä vuonna	Tuotto tai tappio (osaketta kohden)	Hinta osaketta kohden yhtenä vuonna	Tuotto tai tappio (osaketta kohden)
YRITYS A:n joukkovelkakirja	1,00 €	1,00 €	0,01 € tuotto	1,00 €	0,01 € tuotto
YRITYS B:n osake	1,00 €	1,12 €	0,12 € tuotto	0,94 €	0,06 € tappio
YRITYS C:n osake	1,00 €	1,20 €	0,20 € tuotto	0,90 €	0,10 € tappio

Näiden tietojen valossa, ilmoita miten investoit sinulle annetut 50,00 €. Jos et investoi johonkin arvopaperiin, niin merkitse 0 (nolla) kyseiseen kenttään.

Ilmoita niiden joukkovelkakirjojen määrä, mitkä haluat ostaa yrityksestä A:

Ilmoita niiden osakkeiden määrä, mitkä haluat ostaa yrityksestä B:

Ilmoita niiden osakkeiden määrä, mitkä haluat ostaa yrityksestä C:

Investoinnin kokonaismäärä (€):

Seuraava

[*Dropdown menu contains the translation of main instructions in Appendix F2.*]

As the instructions indicate, you have 5.00€ in income and 50.00€ in capital to invest. There are three different securities available to you (both stocks and bonds) for your investment. Currently, the unit price of all three securities is 1€. The yield of the bond and the price change of the shares during the year is as follows:

COMPANY A's bond: You will receive a fixed return of 0.01€ for every 1€ investment you make in this bond, regardless of which of the two events occurs. That is, for every 1€ you invest, you get 0.01€ return without taking any risk.

COMPANY B's share: If event X happens, the share price will rise to 1.12 euros and thus you will earn 0.12€ for every 1€ investment. If event Y occurs, the share price will drop to 0.94€ and thus you will lose 0.06€ for every 1€ investment in this share.

COMPANY C's share: If event X happens, the share price will rise to 1.2€ and thus you will earn 0.20€ for every 1€ investment. If event Y occurs, the share price will drop to 0.9€ and thus you will lose 0.10€ for every one euro invested in this share.

You can invest 50.00€ capital in one of the above securities, two of the above securities, or three of the above securities, whichever way wish.

Below is a summary of the returns for events X and Y:

	Purchase price (per share)	Event X occurs		Event Y occurs	
		Price per share in one year	Profit or loss (per share)	Price per share in one year	Profit or loss (per share)
COMPANY A's bond	1€	1€	0.01€ gain	1€	0.01€ gain
COMPANY B's stock	1€	1.12€	0.12€ gain	0.94€	0.06€ loss
COMPANY C's stock	1€	1.20€	0.20€ gain	0.90€	0.10€ loss

In light of this information, indicate how you will invest the 50.00€ given to you. If you do not invest in a security, please enter 0 (zero) in that field.

State the number of bonds you want to buy from company A: [____]

State the number of shares you want to buy from company B: [____]

State the number of shares you want to buy from company C: [   ]

Total amount of investment (€): [   ]

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Table 9: Summary statistics of all the variables^c

	Whole sample ($n = 128$)		Control group ($n = 64$)		Treatment group ($n = 64$)		
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	$p-$value
Age	21.734	5.564	21.891	5.774	21.578	5.386	0.7521^b
Female	0.523	0.501	0.594	0.495	0.453	0.502	0.1112^c
Years lived ind.	1.375	2.450	1.531	2.576	1.219	2.326	0.4727^b
Has children	0.023	0.152	0	0	0.047	0.213	$0.0797^{*,\ c}$
Lives alone	0.688	0.465	0.656	0.479	0.719	0.453	0.4456^c
Lives with partner / spouse	0.180	0.385	0.203	0.406	0.156	0.366	0.4898^b
Lives with friend / roommate	0.125	0.333	0.125	0.333	0.125	0.332	1.0000^b
SES past: family had money	5.867	1.377	5.938	1.320	5.797	1.439	0.5655^a
SES past: grew up prosper.	5.094	1.704	5.250	1.755	4.938	1.651	0.3015^a
SES past: relatively well	4.539	1.577	4.578	1.531	4.500	1.633	0.7805^a
SES present: bills no worry	5.602	1.276	5.688	1.258	5.516	1.297	0.4481^a
SES present: have money	5.172	1.437	5.422	1.232	4.922	1.587	$0.0486^{**,\ a}$
SES future	5.047	1.441	5.250	1.208	4.844	1.625	0.1111^a
No financial edu. before	0.258	0.439	0.250	0.436	0.266	0.445	0.8399^b
Money talked in childhood	1.852	0.629	1.828	0.606	1.875	0.655	0.6749^a
Test score	9.141	2.910	8.063	3.121	10.219	2.229	$< 0.0001^{***,\ a}$
Willingness to take risks	6.570	1.724	6.594	1.640	6.547	1.816	0.8785^a

^{a} $p-$value of a $t-$test. ^{b} $p-$value of a two-sample proportions test. ^{c} *, **, *** denote, respectively, 10%, 5% and 1% significance levels.