As soon as possible - The effectiveness of a financial education program in Italian schools*

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Abstract

This paper evaluates the effects of a large financial education program prepared by the Bank of Italy, which consists of dedicated teaching materials, teachers' training and classroom activities. By means of two Randomized Controlled Trials, which involved more than 1,500 grade 5 and grade 8 students in 30 schools and three cities, we demonstrate that the program has a sizeable effect on students' financial literacy (between 0.5 and 0.6 SD). The teaching materials alone, which are distributed without being instructed to an alternative treatment group, have a positive effect only for socioeconomically advantaged students. The crucial role of schools in promoting equality of opportunities is demonstrated also in this context.

JEL Classification. [...].

Keywords. [...].

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1 Introduction

Financial literacy plays a crucial role in several key personal life decisions, such as choosing a mortgage or managing savings. While many countries display a low level of citizens' financial competences (see, for instance OECD, 2020), the latter are becoming increasingly relevant for the financial welfare of the whole society (Lusardi, 2019). The lack of financial competences is a problem in societies where the volume and complexity of financial decisions and transactions constantly improve.

Several factors, such as the growing sophistication of the financial markets, the shrinking welfare system and, more recently, the economic difficulties caused by the global shocks that are disrupting economies, such as the pandemic crisis, urged governments to take action for elevating the average level of the population's financial literacy. Young people are key in order to reach the goal of a financially literate and resilient society. For these reasons, and in the attempt of improving the general level of people's financial literacy, in the last two decades many countries have undertaken programs to bring financial education at school, and in some of them, it has been made compulsory.

With respect to financial literacy, Italy lags behind on an international comparison, as shown by the International Survey of Adult Financial Literacy and the Programme for International Student Assessment (PISA),[1] targeted respectively at adults and students (OECD, 2020;OECD, 2018). The financial literacy of Italians is also highly heterogeneous, being lower among young people, those without a bachelor degree and women (D'Alessio et al., 2020). A key role to support financial literacy (FL hereafter) in the country has been exerted by the Bank of Italy, one of the pioneering institutions in this task, devising since 2007 several programs directed at both youths

[1]The PISA survey started to assess financial literacy in 2012.

and adults (De Bonis et al., 2022).

Concerning young people, the Bank of Italy has been promoting since then the program "Financial Education at Schools", in collaboration with the Ministry of Education. The project, aimed at primary, lower and upper secondary school students, offers training courses, organized by the staff of the Bank of Italy, dedicated to school teachers. The teachers then discuss economic and financial topics in the classroom with their students. The project evolved over time, with gradual and constant improvements of both its design and the coverage of topics, in line with the international best practices (OECD, 2012) and benefiting from a constant dialogue with schools. In 2019, the Bank of Italy finalized a new set of didactic resources (booklets) specifically designed for supporting teachers' preparation and teaching specific subjects to the students. With the aim of testing the effectiveness of the project after its renovation, the decision-makers at the Bank undertook rigorous experimental evaluation in collaboration with a research group of the Politecnico di Milano. This paper contains a description of this large experiment conducted by means of Randomized Controlled Trials (RTCs) in 2020-22, and its main findings.

The aim of this paper is threefold. First, we investigate the overall impact of the program, to assess whether it causes an improvement in the financial literacy of the participants. Second, we test whether the individual study of the booklets, without any classroom teaching, improves students FL. Third, we investigate whether program effects are heterogeneous across students' characteristics as well as teachers' characteristics. While the first research question has been extensively studied by the academic literature in the field, there is a substantial lack of rigorous evidence about the second and the third. Moreover, our paper provides timely insights for those countries, such as Italy, in which there is an open political and public debate about whether financial education (FE hereafter) should

be included in school curricula as a compulsory subject.

The rigorous evaluation of classroom FE programs is challenged both by heterogeneity across different schools, school grades and students characteristics and by self-selection into treatment. To tackle such potential sources of endogeneity, we ground our empirical strategy on two RCTs, concerning primary school and lower secondary school students, respectively. For conducting the empirical analysis, we exploit a rich dataset taking from two main sources: (i) student questionnaires on financial literacy, administered both before and after the FEiS program; (ii) student characteristics, including demographic variables and scores in both maths and reading tests, drawn from the National Institute for the Evaluation of the Education and Training System (INVALSI). In addition, we also exploit some information on teachers-level characteristics, gathered by means of non-mandatory questionnaires; the latter were available for a subset of classes only. This is the first time that such dataset and indicators are available in the context of a FE experiment in Italy. The richness of the available databases allows investigate programs' features that have been so far under-explored, such as the heterogeneity of the program's effects.

We find that the program improves students' financial knowledge by between 0.5 and 0.6 SD for both school grades, a result in line with previous research. On the other hand, no impact is detected, on average, for students that were invited to study the volumes on their own, at home.

Investigating heterogeneous effects, student's family socio-economic status (ESCS) matters; in particular, students with higher-than-the-median ESCS experience larger benefits from the Bank of Italy program and improve their financial literacy also when studying on their own.

The remainder of the paper is organized as follows. Section 2 presents a concise review of the literature. Section 3 describes the program in detail and sketches the Italian schooling system. Section 4 explains all the features

of the research method adopted. Sections 5 and 6 present the data and the empirical strategy. Results are explored in Section 7; Section 8 provides further evidence using teacher information. Section 9 concludes.

2 Related literature

In this paper we contribute to two streams of research: the one about the impact of FE programs directed to students, and the one about exploring whether the effectiveness of FE is influenced by teachers' characteristics.

The first stream of research is wide and constantly growing. In order to better clarify our position in the literature, the contributions explored in this section exhibit some specific characteristics: i) they are based on standard teaching classes; ii) they involve students in primary or secondary schools; iii) they are assessed by means of RCTs, considered the gold standard among the evaluation methodologies, thus providing the most credible results to infer causal relationships.

Batty et al. (2015) focus on a program consisting on five short FE lessons (integrated into other curricula) directed to 4th and 5th grade students in the United States. Their strategy is based on a RCT, involving 700 students, whose classes were randomly allocated to either treatment or control. They find a positive effect, of about 1.4 points (about 11 per cent of the maximum score). A more recent randomized experiment on the effectiveness of FE programs directed at primary school and lower secondary school students - consisting in a four-hours financial literacy course - is provided by De Beckker et al. (2021), who focus on 688 8th and 9th grade Flemish students. In particular, they find that the course increased students' financial literacy scores by 0.46 standard deviations, while it did not help improve their consumer choices. Similar results are obtained by Bover et al. (2018), who gather information about 78 schools and more than 3,000

9th grade Spanish students in a 10-hour course called *Finanzas para Todos* ("Finance for All"): while the course does not affect students' budgeting skills or present biasedness, financial knowledge and attitudes improve considerably. Moving to Italy, Agasisti et al. (2022) and Sconti (2022) involve, respectively, 175 students engaged in a 10-hour online course and 650 following either in an online course or an in-person lesson of 4 hours. Both studies refer to secondary school students. Although the differences in terms of duration and sample size, both courses lead to an increase in financial competence, with positive effects of the in-person lesson also 3 months after its conclusion.

Part of the existing research focuses on the impact of experiential or gamified learning. This specific area of study is of crucial importance for the present work. Indeed, the program by the Bank of Italy relies upon a specific pedagogical design: active students participation and gamification. Among others, Kalwij et al. (2019) consider a 45-minute FE gamified lecture, directed to primary school students in the Netherlands, by using a RCT on more than 2,000 students. The authors find that the program raised both pupils' financial literacy and willingness to save. Amagir et al. (2022), again in the Netherlands, assess the effectiveness of "SaveWise", a learning program based on students' action, rather than theory. By exploiting a sample of more than 700 9th grade students, they show that the program increases the students' financial knowledge, encouraging their intentions to save; such effect, however, is only short-term. Similarly, Batty et al. (2020) test whether U.S. students that apply for classroom jobs and practice budgeting and saving end up with an increase in their financial knowledge. Their results, based on a sample of about 11,500 students aged 8 to 11, are positive.

Our work is also related to the literature focusing on the role of teachers on students achievement. A large body of research showed that teachers

shape students' outcomes both at school and later in life (see, among others, Rockoff, 2004 and Chetty et al., 2014). A stream of research, closer to our analysis, investigated the relationship between teachers' characteristics and students' performance on various subjects. Among others, Sancassani (2021) shows that teachers specialized in science have a positive and significant impact on students' science performance; on the other hand, teachers features such as experience, general education level and gender do not affect students' performance. The relationship between the teacher's knowledge of a subject and her teaching effectiveness for that subject, however, might vary across subjects. For instance, Metzler and Woessmann (2012) use data on Peruvian 6th grade students and teachers, and find that while teachers' math knowledge impacts on students' proficiency on the same subject, teachers' reading knowledge does not. On a similar line, Kane et al. (2008) show that the impact of teachers characteristics, such as experience and certification status, on students' performances is heterogeneous across subjects.

We further the latter stream of research by studying whether some teacher characteristics - such as confidence, experience and financial literacy - might affect the effectiveness of financial education programs. This topic has been scantily studied. Harrison (2018) assess the impact of training programs for FE teachers, finding that key teacher characteristics influence both the impact of the training and the effectiveness of FE. In particular, teachers with prior experience of FE are more confident in delivering lessons tailored to students; moreover, teachers with less teaching experience grab the most from training programs with respect, in particular, to the use of technology. These findings provide ground for the need of FE teachers training. Concerning this issue, De Beckker et al. (2019) survey 300 Flemish teachers and find that half of them have sufficient financial knowledge for providing FE; moreover, financial knowledge is higher for

male, higher educated and more experienced teachers.

3 The "Financial Education in School" Program

The program "Financial education in school" (FEiS herafter) falls within a large set of similar initiatives at work worldwide, mostly following OECD's encouragements. In 2005 OECD Recommendation on Principles and Good Practices for Financial Education and Awareness urged countries to introduce FE at school, preferably as early as possible and as a compulsory element in curricula (OECD, 2005). Since then, many countries have indeed introduced programs to improve youths FE at school, with some key differences. For instance, FE is mandatory in Portugal, Sweden and Australia, while it is still offered on a voluntary basis in several countries. In 2012 OECD published the Guidelines on FE at schools (OECD, 2012). The Guidelines recommended the planning of methods to evaluate both the progress and the impact of FE in schools. Since then, OECD's Programme for International Student Assessment (PISA) included an optional assessment of young people's financial literacy in some waves of the survey.

The Bank of Italy's program FEiS aims to introduce basic concept of economics and finance into K-12 school curricula from primary to secondary education. The program, launched in 2008 in collaboration with the Ministry of Education, is directed to school teachers following a "train the trainers" approach, and proposes a multidisciplinary strategy. In particular, Bank of Italy provides specialized training course for teachers at all school levels; then, teachers integrate economic and financial topics in their classroom activities. The program is also supported by didactic resources, for both students and teachers, provided free of charge to program par-

ticipants. School teachers can decide to participate to the program on a voluntary basis.

The number of students reached by the Bank of Italy FEiS program increased over time. The pilot edition took place in 2008/09 school year and involved about 650 pupils in the cities of Rome, Padua and Bari. The information collected about the students who participated to the early editions of the program (measured by means of questionnaires administered both before and after the FE classes) showed a significant increase in their financial competences (Romagnoli and Trifilidis, 2013). In the following years the number of participating students sharply rose: overall, it is estimated that more than 600,000 students were reached by FEiS between 2008 and 2022.

Over time, the program has been reinforced and modified to better meet the needs of schools, and to respond to the changes in the economic context. A major change to the program happened in 2019, when a new series of booklets, named *Tutti per uno economia per tutti! (All for one economics for all!)*, was released by the Bank of Italy. For each school level (primary, lower secondary and upper secondary) there is a booklet for students and a guide for teachers, all available online, together with several additional web content, such as games and interactive figures.[2] The two volumes (per level) are structured in a parallel way and address five topics that children and young people will have to deal with at some point in their lives, either before or after: Income and planning; Money and prices; Payments and purchases; Savings and investment, Credit. Both the language and the pictures used were devised to illustrate the contents in a simple but thorough way, with the aim to improve students' engagement.

[2]The booklets, in particular, can be downloaded as pdf files or requested in print, free of charge, from the Bank of Italy (in 2022 about 50,000 booklets were sent by the Bank of Italy to primary, lower secondary and upper secondary schools).

In particular, the student booklets have as protagonists four boys and a dog, who accompany the readers on their path from primary school to secondary school. The development of these new didactic resources induced the Bank of Italy to assess the effectiveness of the program and its potential heterogeneous effects across student characteristics.

The release of the new resources attracted interest of schools. In school year 2021/22 about 1,900 teachers attended the Bank of Italy training courses. In the following school year, the number of teachers participating to the training sessions rose to 3,000; according to a survey, slightly less than 60 per cent of them undertook FE courses in their classes during the same school year or planned the course for the future.

3.1 The Italian schooling system

The Italian school system consists of three levels of education: primary school (grades 1-5; ISCED level 1), lower secondary school (grades 6-8; ISCED level 2), and high school (grades 9-13; ISCED level 3). Children enroll in the first grade of primary school in the year they turn six, and start lower secondary school when they turn eleven. These two stages are part of the "first cycle" of the educational system, which is compulsory and identical for all students. Our work makes use of grade 5 and grade 8 students who are attending, respectively, their last grade of primary and lower secondary school.

Primary and lower secondary education are quite different in terms of their organization and types of activity. In primary schools, pupils usually have two reference teachers, teaching different subjects, who usually follow them from the first to the fifth grade. The vast majority of the learning activities take place in the school time, as homework are generally very limited. On the contrary, in lower secondary schools, students have several teachers, one for each subject, and are expected to gain knowledge on a

wide range of skills; from the very beginning of lower secondary education, the learning process heavily hinges upon homework and studying at home activities, in order to endow students with competences and study methodologies necessary to cope with the future high-school tracks.

In Italy, financial education is not a mandatory subject at school. Although some elements of economics and finance are included in the curricula, teaching financial education is jeopardized as it is provided on a voluntary basis by teachers. While the debate about the introduction of financial education as a compulsory element of curricula is ongoing, the Parliament is currently discussing a new bill that would include FE within the topics covered by civic education, in both primary and secondary schools.

4 Objectives and Research method

This work aims to rigorously evaluate the effectiveness of the FEiS program. Specifically, the paper answers three main research questions: i) is the program an effective instrument to improve the financial literacy of students who attend it? ii) is autonomous study as effective as classroom activities for the target group? iii) does the effectiveness of the program vary according to the heterogeneous characteristics of students and of their teachers? We focus on primary and lower secondary education, while upper secondary education is excluded from this impact evaluation analysis.

We consider, in particular, grade 5 and grade 8 students. This choice is largely driven by the availability, for them, of a large set of data provided by the National Institute for the Evaluation of the Education and Training System (INVALSI) on both students' characteristics (such as scores in Maths and Italian) and their social and economic status. In the Section 5, we provide a list of the available indicators for individual students - as evident there, this is a particularly rich set of information. The interpreta-

tion of the (individual-level) data provided by INVALSI with the program-specific data has been possible only through the competent collaboration with INVALSI. Notably, this is the first time that rigorous research about the effects of FE in Italy can be enriched by the essential administrative and performance data collected and managed by INVALSI.

In the remainder of this section we provide some information about the design of the two experiments (4.1), the training of the participating school teachers (4.2), the unfolding of the RCTs (4.3) and the questionnaires employed to gather data (4.4).

4.1 Two Randomized Controlled Trials

We follow an experimental methodology, undertaking two fully fledged RCTs, involving 5 and 8 graders, respectively. The random allocation design is made at the school-class level and consists of two steps. In the first step, 30 schools, all belonging to the comprehensive institutes typology (that includes both primary and lower secondary schools) were randomly selected. In order to ensure the representativeness of the analysis, schools were drawn from both Centre & North area (namely, Veneto and Tuscany regions were selected) and South & Islands (Sicily region was selected). In the second step, for each school a triplet of primary school classes (grade 5) and a triplet of lower secondary school classes (grade 8) were randomly drawn.

The design of each RCT (for both grade 5 and grade 8) includes two alternative treatment groups and one control group. In particular, within each school, classes in both the grade 5 and grade 8 triplets was randomly assigned to either: i) a treatment group consisting of classes assigned to training on basic economic-financial topics by means of face-to-face lessons, taught by school teachers (we refer to this group as group A, i.e. "treatment"); ii) a treatment group consisting of classes whose students are asked

to study at home using the booklets *All for one economics for all!* (group B, i.e. "alternative treatment"); iii) a control group (group C). This particular design of the experiment is an innovative and valuable feature of the present study. The treatment A ("classroom activity") mimics the program proposed by the Bank of Italy yearly to the school system; using this form of treatment we can evaluate the effectiveness of the FEiS program. Instead, by means of treatment B (that we define "individual study") we can test whether the simple study of the booklet released by the Bank of Italy at home is sufficient to improve students' financial literacy. The comparison between the two treatments allows to investigate the role of teachers in fostering financial literacy among students.

The random draw of the schools was made by INVALSI. The principals of the selected schools were firstly reached by INVALSI and invited to join the RCT; during the first contact, school principals were given a set of general information about both the Bank of Italy program and their school's involvement in the RCT. Those principals who showed interest to the FEiS program were then contacted by the Bank of Italy researchers, who provided more detailed information.

In order to increase the participation rate of the schools and reduce their burden, only two topics out of the five covered in the FEiS, were chosen to be included in the RCT: income and budgeting, and saving. In particular, the income and budgeting chapter is the first of the booklet; it introduces the students to the topic and describes how important income is to have regular earnings over time to ensure not only survival but also well-being. The second chapter chosen focuses instead on the concepts of saving and investment and risk reward. Our choice of grounding the RCTs on two topics only is coherent with the way the FEiS program is actually implemented by most school teachers, who usually carry it out over two school years (hence covering two or three topics each year) to avoid an

excessive burden on compulsory activities.

Among the institutes that have been contacted, 19 accepted to participate: 11 schools headquartered in the Center & North and 8 in the South & Islands. The majority of school principals who decided not to join the RCT based their decision on the general difficulties experienced by their institute due to the Covid-19 pandemic, which negatively affected teaching activities. In particular, school principals whose classes suffered more severe Covid outbreaks preferred their students to concentrate on traditional school programs, rather than introducing new activities. Since severe Covid-19 outbreaks are independent of school characteristics, we claim that the sample of 19 schools that took part to the program should be considered as representative of the Italian population of schools.

4.2 School teachers training

After the engagement of the schools, in order to coordinate the activities of the three groups of classes (i.e., Groups A, B and C), in each school a project supervisor for each grade was appointed, mostly from the pool of teachers. Then, all the teachers of the classes involved in the experiment and project supervisors were provided with detailed instructions about the experiment at hand. To this aim, a series of training sessions was arranged by Bank of Italy researchers.

The training consisted in a 3-hour online meeting, composed of a 2.5 hour seminar and a 30' Q&A session. The first part of the seminar replicated the training that Bank of Italy organizes for teachers who participate to the FEiS program. In this way, we mimic the functioning of the FEiS program. The second part of the seminar involved instead the unfolding of the RCT, whose steps were explained in detail.

To meet the teacher needs and stimulate their attendance, 7 training

sessions were arranged between November 2021 and February 2022.[3] In order not to introduce confounding factors in the experimental setup, all the training seminars were held by the same Bank of Italy researchers. Moreover, all teachers and supervisors were invited to attend a plenary Q&A session in March 2022, where all the necessary clarifications about the RCT were provided. In addition, a dedicated email account was set up to promptly address any problem signalled by the teachers during the unfolding of the RCT.

The participation to the training seminar was mandatory for project supervisors and Group A teachers (i.e., those asked to undertake FE classes at school), while Group B and Group C teachers participated on a voluntary basis. Overall, 137 teachers attended the training and Q&A sessions.

4.3 The practical features of the RCTs

The Bank of Italy handled all the logistic aspects of the RCT. Each participating school received a mail-box containing the *All for one economics for all!* booklets for its students, the teacher manuals, both pre-tests and post-tests for students, and stickers with the students anonymous INVALSI-codes used by the teachers to label each test (see figure 1). In order not to discriminate group C students (control group), the mail-box included booklets for them as well; the latter were consigned to group C students by their teachers only once the experiment was concluded. At the end of the activities, all participants involved in the RCT - students, teachers and schools - received a certificate of thanks issued by the Bank of Italy.

Each school completed the teachers' training activities at different points in time. Once a school had completed such activities, the experiment be-

[3]The training sessions took place on November 29th, December 2nd, December 9th, December 15th, January 17th, February 15th, and February 21st.

gun. For each grade, the three classes involved in the school (i.e., Groups A, B and C) were asked to coordinate among themselves, with the activities being tailored on Group A's schedule. In particular, the three groups of students were administered a pre-test in the same week. Afterwards, when group A's teaching activities in class begun, group B students were asked to start studying the booklets at home. When the group A's teaching activities were completed, the three groups of students were administered a post-test (see figure 2). Teachers, regardless whether their students were in group A, B or C, were administered two non-mandatory questionnaires: one before the begin of the experiment, and one once the experiment was concluded. All the single phases of the experiment have been carefully monitored to check the validity of the procedures followed by each school, and to avoid all the potential inconsistencies.

4.4 The questionnaires

4.4.1 Students questionnaires

The students' pre-test and post-test questionnaires consist of 9 or 10 questions each, depending on the students grade. The questionnaires are organized in three sections. The first section is about income and budgeting, covered in chapter 1 of the booklets; the second section involves saving, featuring in chapter 4 of the booklets; finally, the third section is aimed at detecting students' attitudes, such as the tendency to focus more on the current rewards than on those in the future when making decisions. The pre-test grade 5 students questionnaire is reported in Appendix 1, while the remaining ones are available from the authors upon request.

All the questions were firstly assessed through a pilot study in school year 2020-21, undertaken on two or three classes for each grade. This preliminary step is crucially important for the validity of this research and

it is a distinctive feature of this assessment. Indeed, the final questionnaires are not only informed by the best research in the field, but are also adapted to the specific characteristics of the Italian school system (see Section 3.1).

The students questionnaires were administered on paper, as this modality was largely preferred by the teachers. In compliance with Italian data protection laws, the questionnaires were anonymous. In order to associate each pair of questionnaires (pre- and post-) and to link data about students' characteristics (provided by INVALSI) to the test results, students were individuated by an anonymous code (INVALSI-SIDI code). The list of anonymous students' SIDI codes (without the corresponding students' names) was provided to the Bank of Italy by INVALSI. The individual codes were then printed together with other information - such as school names, grades and group codes - on stickers and sent to the schools. The association between the SIDI anonymous codes and students names was made by the teachers at school, for each test. Finally, the questionnaires were returned to the Bank of Italy.

Concerning the questionnaires scoring, each question (often consisting of several items) could earn a maximum of 1 point, with a couple of exceptions referring to more difficult ones, earning 2 points each. Wrong or missing answers earned zero points, as no negative scoring was adopted. To obtain the final score of each student, all question scores were summed up and [0,1] normalized.

4.4.2 Teachers questionnaires

The two questionnaires directed to teachers were not mandatory. The first questionnaire (conducted before the experiment) was employed to gather some demographic characteristics of them such as gender, age, level of education, teaching experience and subjects taught. Moreover, it was also meant to assess whether the teachers had already taught FE or took

part to FE courses before, and to describe their relationship with finance (i.e., saving and investment habits). The main research-related object of this questionnaire is to gather relevant information about the teachers' background and their specific involvement with FE. The hypothesis is that some features might be associated with their effectiveness in teaching FE, which in turn affects the students' performance.

The final questionnaire was used to gather information about the unfolding of the experiment, such as the duration of the FE lectures, and to associate the teachers to their class. The specific aim of this second questionnaire is to collect evidence about the different practical ways in which each teacher has implemented the FEiS program. While the guidelines are common across schools and classes, differences in the effort and practical small decisions taken by teachers might have an effect on the program's effectiveness. In fact, teachers necessarily tailored the FEiS program to the students' needs. Both questionnaires, not reported in this paper for brevity, are available upon request from the authors.

5 Data

In the spring of 2022, the two experiments ended with the final tests by all the students involved. About 1,000 grade 5 students and 1,100 grade 8 students filled in the questionnaires. Alongside the questionnaires, the evaluation study also uses an additional database about the students, provided by INVALSI and related to their individual characteristics (e.g. demographic traits, test scores in Mathematics and in Italian) as well as their social and economic status (ESCS), and data on students' classes. A detailed description of the data is provided in the next Section 5.1.

In this paper, we exploit mathematics and reading tests conducted by INVALSI in the same year in which our experiment has been conducted

(2021/22). We believe that controlling the performance in financial literacy with the INVALSI test scores is a very important aspect - and a truly innovation of this paper. On one side, FE tests questions covered very different topics with respect to those in the INVALSI tests. On the other side, since mathematics and reading skills do positively correlate with financial literacy, one could argue that INVALSI tests led students to study more, affecting in turn financial literacy. This is unlikely to bias our results, as such additional treatment would involve all the three groups of students (A, B and C). If any, it would lead to a downward bias of our estimates, which would then provide a lower bound.

Since INVALSI tests are run for grades 2, 5, 8, 10 and 13, an alternative possibility was to use INVALSI tests run at grade 2 for 5 graders, and those run at grade 5 for 8 graders. However, this option was suboptimal for two reasons. First, such earlier score tests were very distant in time from the experiment at hand. Second, since students attend grades 1-5 in a primary school and then they change institution to attend grades 6-8 in a lower secondary school, the above alternative strategy would have caused a severe drop of data, impairing the RCTs.

The additional information on students (from INVALSI) and teachers (from questionnaires) characteristics holds significant value. Such information enables us to make more accurate assessments of the program's effectiveness. Moreover, such information allows us to evaluate whether the program's effectiveness varies according to observable characteristics of both teachers and students (heterogeneity analysis).

5.1 Descriptive statistics

To ensure data accuracy, we perform a thorough cleaning process on the collected data. Students whose SIDI codes are not in our INVALSI database or who left the questionnaires blank, were dropped. Moreover,

we exclude two triplets of primary school classes due to the unavailability of A treatment classes data: one class had missing pre-tests while the other one was removed because of cheating, since its post-tests were all filled out with the same handwriting.

Table 1 describes a list of the main students' variables adopted in the analyses (including their definition), that is individual characteristics, pre-test and post-test scores, the difference between these two latter measures (i.e. delta score), the mean between the INVALSI Math score and the INVALSI Italian score, and students' patience and saving. These latter come from two questions on intertemporal choices and saving management placed in the third section of the Questionnaire (see Appendix 1).

Tables 2 and 3 provide a comprehensive overview of descriptive statistics for grade 5 and grade 8 students respectively, split by treatment group; the final samples includes 639 grade 5 students from 17 institutes, and 899 grade 8 students from 19 institutes. The distribution of males and females in the two school grades is almost symmetrical, with grade 5 having 48 per cent females and grade 8 having 53 per cent females. The students from both grade levels reveal the same initial financial knowledge, with 57 per cent of correct answers. Furthermore, when we analyze the mean between the INVALSI Math score and the INVALSI Reading score, we observe differences that mirror the national trends, that is grade 5 students exhibiting better results compared to grade 8 students. As a matter of fact, in our sample grade 5 students achieve an average score of 203, while grade 8 students score an average of 192, in the face of a national-level average conventionally set at 200. Moreover, some level of heterogeneity emerges also inter-grade. The first point is about pre-test scores: while the Wilcoxon rank-sum tests indicate no statistically significant differences between the scores of groups A (preferred treatment) and C (control), groups B (alternative treatment) display a slightly larger (lower) score in grade 5

(grade 8) students. Second, ESCS (socioeconomic status index) and the mean between the INVALSI Math score and the INVALSI Italian score in grade 8's groups A are higher, suggesting inequalities in students' family and educational background. Last, pre-test patience is significantly lower in grade 5's groups C, with a 10 per cent gap with respect to the other two groups. These imbalances in the composition of students' groups are tackled in the empirical analysis by means of a regression approach that properly controls for such differences.

Concerning post-treatment data, using Wilcoxon rank-sum tests it emerges that in both grades 5 and 8 post-test scores and delta scores of groups A are greater than groups B and C, but the same does not apply between post-test scores and delta scores of groups B and C, supporting the effectiveness of the FEiS program.

6 Empirical strategy

We analyze the impact of the FEiS program by means of two RCTs, respectively for grade 5 and grade 8. For each school grade we estimate the following baseline regression model:

$$\begin{aligned} Post_{ij} = \beta_0 + \beta_1 \cdot Pre_{ij} + \beta_2 \cdot Treat_{A_ij} + \beta_3 \cdot Treat_{B_ij} + \\ + \lambda \cdot X_{ij} + \gamma \cdot Class_j + School_{FE_j} + \epsilon_{ij} \end{aligned} \tag{1}$$

where $Post_{ij}$ is the post-test score (on financial literacy) of student i in school j. Pre_{ij} is the pre-test score, $Treat_{A_ij}$ and $Treat_{B_ij}$ indicate whether the student has been randomly assigned to group A or group B. While the balancing tests (see Tables 2 and 3) are reassuring about the randomization, in order to obtain more precise estimates, and to control for potential confounding factors, we also include a large set of covariates. In particular, X_{ij}

is a vector of student specific characteristics and $Class_j$ is a vector of class-level variables. Students characteristics include: gender, nationality, early enrollment, an indicator for socio-economic and cultural status of the student's family (ESCS), pre-test patience, pre-test saving, and mean between INVALSI Math score and INVALSI Italian score; class-level covariates include: class mean between INVALSI Math score and INVALSI Italian score, and number of students per class. School fixed effects $SCHOOL_{FE_j}$ are also included to control for structural, persistent and unobservable quality differences across schools. This way, we would avoid attributing the effectiveness of the program to pre-existing differences among schools. Standard errors are clustered at the class level.

In a second step of the empirical analysis, student-level covariates are then employed to investigate whether the potential impact of the program is heterogeneous according to different students characteristics, by means of interaction terms.

7 Results

The results of the estimates are provided in three separate subsections: 7.1 shows the average treatment effects of the two treatments (i.e. the main treatment and the study at home treatment) on students' financial knowledge of grades 5 and 8 students, respectively; 7.2 investigates the presence of heterogeneous treatment effect across students' characteristics; 7.3 provides some tests to check for the robustness of our results.

7.1 Treatment effects

Table 4 and Table 5 present the effects of the treatments for grade 5 and grade 8, respectively, when only student-level covariates are included in the model. In presenting such results, we estimate four alternative models,

from a parsimonious one to a model that includes the full set of controls. In particular, Model 1 controls only for gender, naitonality and ESCS; Model 2 includes students' academic performance; Model 3 incorporates class-level variables; Model 4 controls also for students' financial behavior.

Let us first consider Table 4, referring to grade 5 students. The estimates show that the program improves students' financial knowledge by about 8 per cent, which is approximately equivalent to an increase of one additional correct answer. Such effect is stable and statistically significant across the four models. In terms of effect size, we observe a value of 0.54 SD, considered "large" according to Kraft (2020). No effect is detected for instead treatment B (i.e., study at home treatment). When looking at the control variables, foreign students' post-test scores are 5 percentage points lower than their Italian counterparts, and higher performance in INVALSI tests have a positive impact on a better grasp of financial concepts, ceteris paribus. Also note that the coefficient of the ESCS loses its statistical significance when the mean between the INVALSI Math test and the INVALSI Italian test is introduced in Models 2, 3, and 4.

Grade 8 students results, provided in Table 5, are very similar to the evidence related to grade 5. Students assigned to group A have better post-test scores with respect to students in group C, while no impact is detected for group B students. The treatment A's effect remains consistent across all Models, with a magnitude of 8.5 per cent and an effect size of 0.66 SD.

7.2 Heterogeneous effects

In Table 6 and Table 7 we assess whether the program effects are heterogeneous across students' individual characteristics. We focus, in particular, on the following variables: student's gender; student's skills, measured by their performance at INVALSI Math and Reading tests; student's class average skill, measured by their performance at INVALSI tests; student's

family socio-economic and cultural status. To simplify interpretation, continuous individual-level regressors are dichotomized by a median split. Results show that no heterogeneity is detected with respect to gender and to both student and class skills. However, for both grade 5 and grade 8 students, a positive and statistically significant interaction between group B treatment and ESCS emerges. In particular, students in group B (i.e., subjected to the alternative, study at home treatment) with higher ESCS obtain higher post-test financial literacy scores compared to their group B peers with lower ESCS. In other words, socially and culturally advantaged students can benefit from the booklets also through personal reading, and not only through the learning activity provided by teachers.

7.3 Robustness checks

In this section we perform a couple of robustness exercises, grounded on alternative specifications of the baseline models. Models 1 in Table 8 and Table 9 show the results obtained by employing an alternative question scoring method. In particular, rather than scoring in accordance with the difficulty of each question, we calculate the pre- and post-test scores through a straightforward method, awarding 1 point for every correct answer. The earlier findings remain robust to this alternative scoring method. Models 2 in Table 8 and Table 9 present instead the estimates of an alternative equation, where the response variable is given by the difference between post-test and pre-test scores (i.e. delta scores), rather than the post-test score. The effectiveness of treatment A is, again, confirmed, for both grade 5 and grade 8 students. There are, however, additional insights to be discussed. The analysis among grade 8 students reveals that the distribution of the booklets has a statistically significant and positive, although small in size, effect on students' financial literacy. No effect of study at home is detected, instead, for grade 5 students. This results suggests

that students' maturity level plays a role, where only sufficiently mature students fully benefiting from the material. Additionally, the robustness regressions based on delta scores show some evidence that the program has a slightly larger impact on grade 8 female students.

8 Teachers analysis

In this section we exploit teachers-level information. Our aim is threefold. First, we provide a further robustness exercise of our baseline findings, by adding teachers characteristics among the set of controls. Second, we investigate whether the impact of the program is heterogeneous across some teacher features and, third, across the duration of the Group A lectures.

8.1 Descriptive statistics

Table 10 describes the teachers-level variables adopted in the analyses. A first group of variables describes teachers gender, age and teaching experience. A second group of variables provides information about teachers relationships with finance. In particular, we observe whether teachers: have already dealt with economic and financial topics in his or her classes ("dealt with fin. topics"); manage her current account online or use digital payments ("digitalization"); have left all his/her last year's savings in the current account ("CA only"). Finally, for group A teachers, we obtain the duration of the financial education classroom lectures.

When considering the responses from teachers, the voluntary nature of their participation in the questionnaires has a significant impact on the sample size. Approximately 60 per cent of the teachers who took part in the initial questionnaire either skipped at least one question or left the online session before completing it. In addition, half of the teachers who participated in the first questionnaire were not matched with the participants in

the final questionnaire.

Tables 11 and 12 provide a comprehensive overview of descriptive statistics for both grade 5 and grade 8 teachers, split by group. The final sample comprises 27 grade 5 teachers from 14 institutes, and 30 grade 8 teachers from 16 institutes. Regarding the grade 5 teachers, they are all female except two, almost half of them are between 56 and 65 years old, and one out of five has more than 31 years of experience. Concerning the grade 8 teachers, they are more heterogeneous than grade 5 counterparts: there is a bigger male fraction (17 per cent), they are younger (one out of three is less than 45 years old), and have less school experience (40 per cent has less than 10 years of school experience).

All in all, using this additional information comes at the price of a sensible drop in the number of observations. In particular, the sample of grade 5 students have been reduced from 639 to 292, whereas grade 8 students fell from 899 to 533. The loss of more than half of the sample of grade 5 students does not allow us to undertake a robust investigation that is representative of the original population; therefore, the analyses that follow are only performed for grade 8 students.

8.2 Results

8.2.1 Treatment effect controlling for teacher characteristics

We first estimate again our baseline model adding teacher-level information. Results, reported in Table 13 and referring to grade 8 students, confirm our baseline findings. Differently from previous results, not only the main treatment (A) is confirmed as statistically associated with performance, but also the coefficient of treatment B is statistically significant, as the post-test score of students increases by around 3-4 percentage points in Model 3. None of the teacher variables is statistically significant.

8.2.2 Heterogeneous effects across teacher characteristics

Second, we proceed to check whether teachers' financial behaviors may influence the FE learning process of their students. To do so, both treatments interact with the three teacher-level dummy variables described above. Namely, "dealt with fin. topics", "digitalization", and "CA only". The results are presented in Table 14. Looking at Model 1, when the variable "dealt with fin. topics" is considered, a student in group A improves his/her outcome in the post-test by 21.5 per cent if the FE course is taught by a teacher who has already dealt with economic and financial topics. This is a very strong effect in magnitude. Moving to Model 2, we observe again a positive and statistically significant interaction between teachers' behaviors and treated students' performance, as the post-test score of group A's students increases by 10 percentage points when their teacher either manages his/her current account online or use digital payments. Lastly, no statistically significant interaction emerges in Model 3, when "CA only" teachers are interacted with the treatment.

8.2.3 Duration of the lectures and impact of the program

Finally, we investigate whether the impact of the program depends on the amount of hours dedicated to classroom teaching. In particular, we split Group A classes according to whether their teachers dedicated more than 9 hours to the FE classroom activities or less than that. Then, we estimate the following model:

$$\begin{aligned} Post_{ij} = \beta_0 + \beta_1 \cdot Pre_{ij} + \beta_2 \cdot Treat_{A1_ij} + \beta_3 \cdot Treat_{A2_ij} + \\ + \beta_4 \cdot Treat_{B_ij} + \lambda \cdot X_{ij} + \gamma \cdot Class_j + School_{FE_j} + \epsilon_{ij} \end{aligned} \tag{2}$$

where $Treat_{A1_ij}$ and $Treat_{A2_ij}$ indicate group A students undertaking longer classroom activities (i.e. more than 9 hours overall) and shorter classroom

activities (i.e. 9 hours at most), respectively. All other variables are the same of model 1.

Results, displayed in Table 15, show higher estimated coefficient for treated students belonging to the treatment group with more teaching hours. In particular, the program leads to an increase of financial literacy by about 11 per cent for students who benefited from longer lectures, and of less than 5 per cent for students in the shorter lectures group. Not surprisingly, the latter effect is not different from that associated to treatment B (i.e., study at home). In summary, this evidence suggests that dedicating a minimum of 4-6 hours per class session to each FEiS topic (the experiment encompassed two distinct topics) seems essential for the program's overall effectiveness.

9 Concluding remarks

In this paper we assess the effectiveness of a Bank of Italy's FEiS program for grade 5 and grade 8 Italian students, claiming the importance of such topics for young people. The study employs two RCTs with a school-class level randomization. Students are divided into three groups: group A ("treatment" group), group B ("alternative treatment" group), and control group C. Treatment A mimics the FE program offered nationwide by the Bank of Italy, yearly since 2008. In particular, the program follows a "train the trainer" approach, where teachers are firstly instructed by Bank of Italy on financial and economics topics; later, they undertake classroom activity supported by didactic resources *All for one economics for all!*. The alternative treatment, i.e. treatment B, consists in the self-study of the same didactic resources by the students. Together with the involvement of students, whose financial literacy competencies are tested through pre- and post-questionnaires, also teachers actively participate, and do so be-

yond their teaching role. Indeed, not only they are trained regarding the program but are also administered questionnaires on financial habits and evaluation of the FE initiative.

The FEiS program by the Bank of Italy improves financial knowledge of students in both levels of education. The effect size of the intervention results to be 0.54 SD for grade 5 and 0.66 SD for grade 8, which is a sizable and consistent with previous experiments (Batty et al., 2020; De Beckker et al., 2021; Sconti, 2022). No impact is detected, instead, on average for self-study for both grades.

Deepening the investigation through the analysis of heterogeneous effects, it turns out that the students' socioeconomic status plays a crucial role in the transmission of financial knowledge within groups. As a matter of fact, students with high ESCS who received the booklets to study at home performed better on the post-test compared to their peers with lower ESCS. This is an important finding, as it supports the claim that socioeconomically advantaged students can benefit from FE even without a direct involvement of teachers. The same does not happen for more disadvantaged students, though. These results highlight the importance of the school institution in promoting financial literacy and bridging inequalities arising from diverse family backgrounds. In this vein, the effort by teachers should be primarily directed towards the less privileged students.

Financial behaviors of teachers involved in the FE course seem to matter in the ability of students to acquire new financial knowledge. This feature of the present study, although referred to grade 8 students due to data availability issues, is particularly innovative. It is almost the first time that detailed data about teachers are merged with experimental microdata about students. The effort is worthwhile because we demonstrate that heterogeneity of teachers' behaviors are associated with variation in students' knowledge and with the program's effects. Specifically, teachers that have

already shown interest in economic and financial subjects or embrace digital financial tools are able to impact the results of students, especially the former, with a final effect on post-test scores that is almost three times the baseline effect.

The findings obtained through our research hold four major policy implications. First, well-designed materials and programs for increasing financial literacy actually work, and the effects that they obtain are sizeable. Thus, it is necessary and helpful to continue promoting high-quality interventions in the FE domain – this is also what the Italian "Committee for the planning and coordination of financial education activities" underlines every year. Second, the role of teachers is decisive. The program we tested obtain its causal impacts on financial literacy via the teaching activities during the classroom's time. The positive effects obtained by booklets alone for students whose families have higher ESCS underline that the classroom activities is particularly relevant for less advantaged ones, so promoting equality in the educational opportunities. Third, there is heterogeneity across teachers, and it must be taken into account. Given that more financially active teachers can improve the effect of the FEiS program, a specific training for all seems necessary. Finally, if the conditions mentioned above are met (high-quality materials and programs, and teachers' competence), then it can be the time to introduce Financial Literacy among the mandatory subjects in curricula, since the early grades. This is a policy already implemented in various European countries, and can pave the way for a general improvement of financial competence across the whole Italian population.

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Figures and tables

Figures

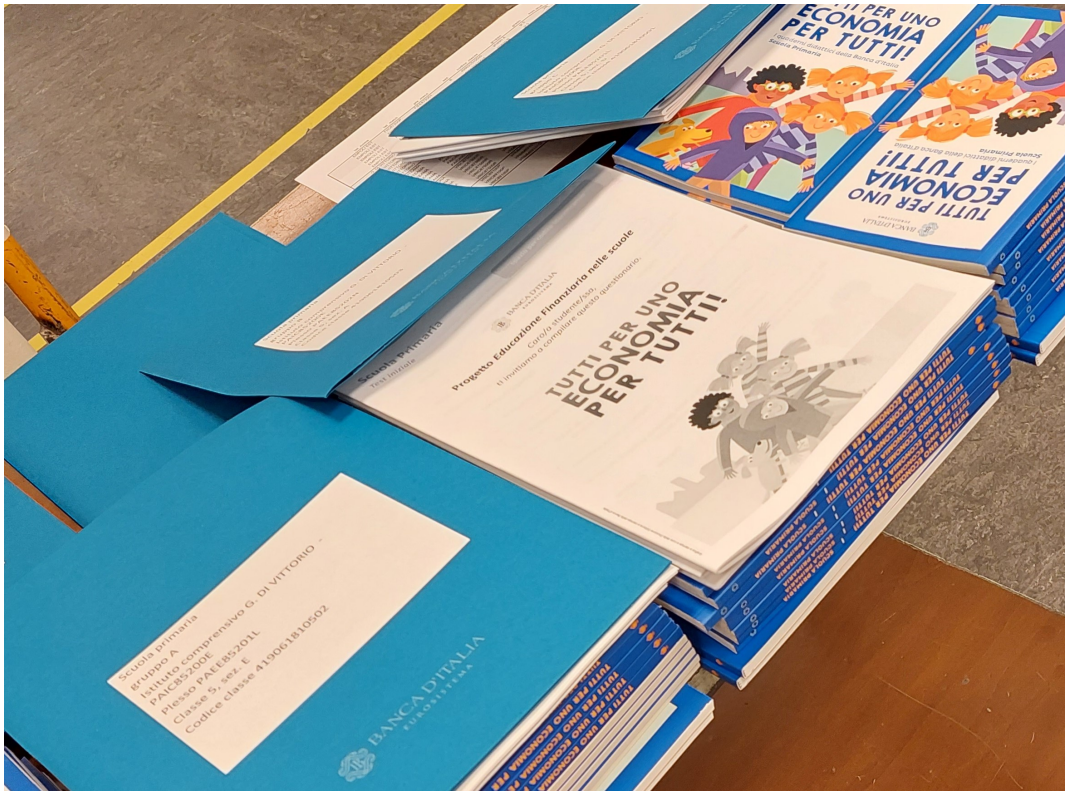


Figure 1. Content of the mail-box sent to RCT participant schools

Notes: *All for one, economics for all!* booklets for the students (small volumes) and the teachers (large volumes), pre- and post- tests, RCT instructions and stickers with the students anonymous SIDI-codes (in the folders).

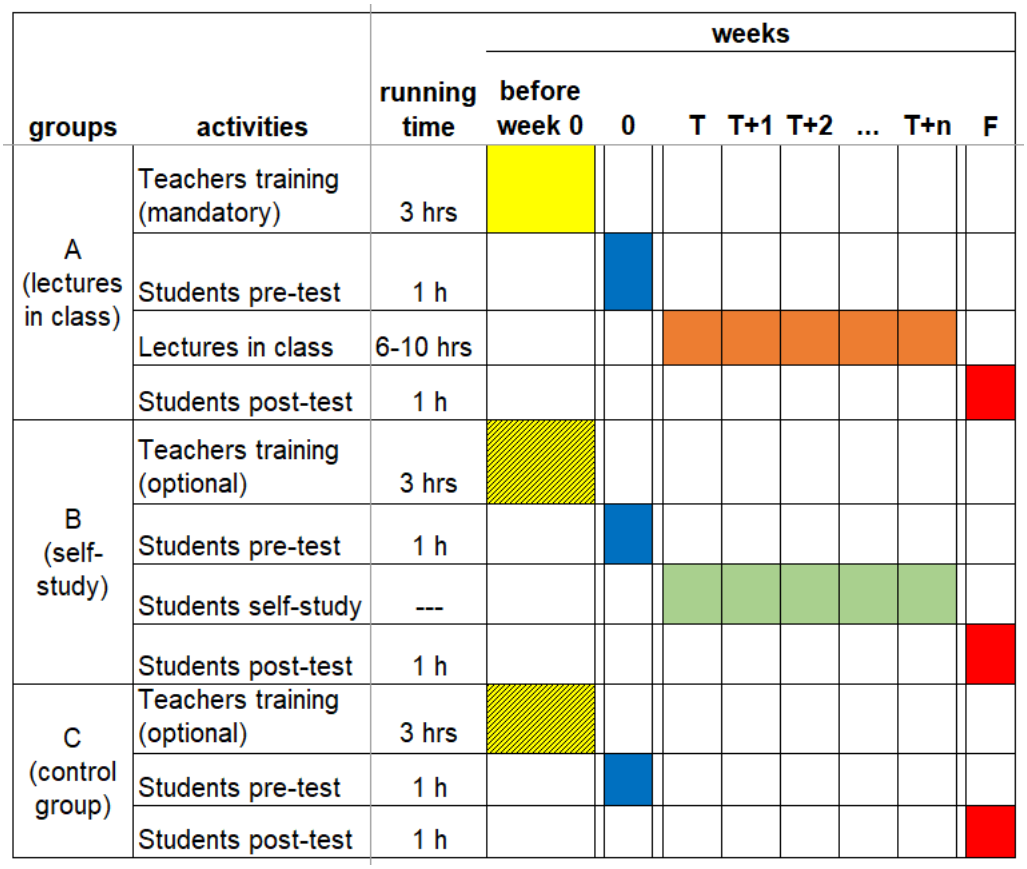


Figure 2. GANTT characterizing the two RCTs

Notes: In each RCT participant school administered both pre-test and post-test to Groups A, B and C students in a coordinated fashion, with a timing tailored to Group A's needs.

Tables

Table 1. List of students' variables

Variable	**Description**	**Value/range**
Individual characteristics		
Female	If the student is a female	1 or 0
Foreign	If the student is foreign	1 or 0
ESCS	Student's ESCS	from -3 to 3
Class-level characteristics		
Class mean INVALSI Math-Ita	The class mean between the INVALSI Math score and the INVALSI Italian score	from 129 to 229
Students per class	The number of students in each class	from 10 to 24
Financial knowledge		
Pre-test score	Pre-test score in financial knowledge	from 0 to 1
Post-test score	Post-test score in financial knowledge	from 0 to 1
Delta score	The difference between pre-test score and post-test score in financial knowledge	from -1 to 1
Financial behaviors		
Pre-test patience	If the student, in the pre-test, always prefers to wait for an higher reward	1 or 0
Post-test patience	If the student, in the post-test, always prefers to wait for an higher reward	1 or 0
Pre-test saving	If the student, in the pre-test, prefers to save either all or most of his/her money	1 or 0
Post-test saving	If the student, in the post-test, prefers to save either all or most of his/her money	1 or 0
Academic performance		
Mean *INVALSI* Math-Ita	The mean between the *INVALSI* Math score and the *INVALSI* Italian score	from 64 to 315

Table 2. Descriptive statistics - Grade 5

Variable	**A**	**B**	**C**	**p-value**
Female	115 (49%)	96 (47%)	96 (49%)	0.9
Foreign	41 (17%)	42 (20%)	32 (16%)	0.5
ESCS	0.15 (1.16)	0.14 (1.12)	0.08 (1.22)	0.9
Pre-test score	0.56 (0.20)	0.59 (0.20)	0.55 (0.18)	0.058
Pre-test patience	98 (42%)	93 (45%)	66 (34%)	0.051
Pre-test saving	174 (74%)	152 (74%)	143 (73%)	>0.9
Mean INVALSI Math-Ita	204 (36)	205 (36)	199 (37)	0.2
Class mean INVALSI Math-Ita	202 (21)	202 (17)	198 (17)	0.8
Students per class	17.9 (3.1)	18.6 (3.0)	18.4 (4.2)	0.7
Post-test score	0.74 (0.16)	0.65 (0.18)	0.65 (0.18)	<0.001
Delta score	0.18 (0.23)	0.05 (0.20)	0.09 (0.21)	<0.001
Post-test patience	123 (52%)	77 (37%)	67 (34%)	<0.001
Post-test saving	186 (79%)	149 (72%)	145 (74%)	0.2
N	236	206	197	

Note: continuous variables (in italics) are represented as means and standard deviations. Dummy variables are represented as frequencies and percentages. The p-values for continuous variables come from a Kruskal-Wallis rank sum test, whereas the p-values for categorical variables come from a Pearson's Chi-squared test.

Table 3. Descriptive statistics - Grade 8

Variable	**A**	**B**	**C**	**p-value**
Female	154 (52%)	168 (53%)	152 (53%)	>0.9
Foreign	39 (13%)	56 (18%)	38 (13%)	0.2
ESCS	0.05 (1.08)	-0.17 (1.04)	-0.24 (1.15)	0.004
Pre-test score	0.59 (0.16)	0.54 (0.18)	0.57 (0.17)	0.003
Pre-test patience	77 (26%)	85 (27%)	71 (25%)	0.9
Pre-test saving	201 (68%)	223 (70%)	197 (69%)	>0.9
Mean INVALSI Math-Ita	198 (37)	191 (40)	189 (40)	0.022
Class mean INVALSI Math-Ita	191 (20)	187 (22)	183 (25)	0.5
Students per class	20.7 (3.7)	20.7 (3.6)	20.4 (4.3)	>0.9
Post-test score	0.63 (0.14)	0.54 (0.15)	0.54 (0.15)	<0.001
Delta score	0.04 (0.19)	0.00 (0.19)	-0.04 (0.19)	<0.001
Post-test patience	68 (23%)	71 (22%)	65 (23%)	>0.9
Post-test saving	214 (73%)	229 (72%)	203 (71%)	0.9
N	294	319	286	

Note: continuous variables (in italics) are represented as means and standard deviations. Dummy variables are represented as frequencies and percentages. The p-values for continuous variables come from a Kruskal-Wallis rank sum test, whereas the p-values for categorical variables come from a Pearson's Chi-squared test.

Table 4. Treatment effect on post-test score - Grade 5

	Dependent variable:			
	Post-test score			
	(1)	(2)	(3)	(4)
Pre-test score	0.288***	0.148***	0.143***	0.144***
	(0.037)	(0.037)	(0.037)	(0.037)
Treatment A	0.081***	0.075***	0.074***	0.075***
	(0.020)	(0.019)	(0.021)	(0.020)
Treatment B	−0.002	−0.010	−0.013	−0.011
	(0.024)	(0.021)	(0.022)	(0.021)
Female	0.002	0.011	0.010	0.012
	(0.013)	(0.013)	(0.013)	(0.013)
Foreign	−0.067***	−0.051***	−0.051***	−0.051***
	(0.021)	(0.017)	(0.017)	(0.018)
ESCS	0.021***	0.006	0.006	0.006
	(0.006)	(0.006)	(0.006)	(0.006)
Mean INVALSI Math-Ita		0.002***	0.002***	0.002***
		(0.0002)	(0.0002)	(0.0002)
Class mean INVALSI Math-Ita			0.001	0.001
			(0.001)	(0.001)
Students per class			0.001	0.001
			(0.004)	(0.004)
Pre-test patience				−0.016
				(0.011)
Pre-test saving				0.005
				(0.013)
Observations	639	639	639	639
R^2	0.387	0.463	0.465	0.467
Adjusted R^2	0.366	0.444	0.444	0.444
Residual Std. Error	0.143 (df = 617)	0.134 (df = 616)	0.134 (df = 614)	0.134 (df = 612)

Note: *p<0.1; **p<0.05; ***p<0.01. All the models include school fixed effects and clustered standard errors at the class level.

Table 5. Treatment effect on post-test score - Grade 8

	Dependent variable:			
	Post-test score			
	(1)	(2)	(3)	(4)
Pre-test score	0.239***	0.210***	0.205***	0.201***
	(0.039)	(0.043)	(0.044)	(0.045)
Treatment A	0.084***	0.083***	0.085***	0.085***
	(0.014)	(0.014)	(0.014)	(0.014)
Treatment B	0.010	0.009	0.009	0.009
	(0.016)	(0.017)	(0.016)	(0.016)
Female	0.005	0.003	0.003	0.002
	(0.009)	(0.009)	(0.009)	(0.008)
Foreign	−0.005	0.0003	0.001	−0.001
	(0.016)	(0.016)	(0.016)	(0.015)
ESCS	0.007*	0.003	0.002	0.002
	(0.004)	(0.004)	(0.005)	(0.005)
Mean INVALSI Math-Ita		0.0004***	0.0005***	0.0004***
		(0.0002)	(0.0002)	(0.0002)
Class mean INVALSI Math-Ita			−0.0003	−0.0003
			(0.001)	(0.001)
Students per class			0.003	0.003
			(0.003)	(0.003)
Pre-test patience				0.027**
				(0.011)
Pre-test saving				−0.001
				(0.012)
Observations	899	899	899	899
R^2	0.197	0.204	0.206	0.211
Adjusted R^2	0.175	0.182	0.182	0.186
Residual Std. Error	0.139 (df = 875)	0.138 (df = 874)	0.138 (df = 872)	0.138 (df = 870)

Note: *p<0.1; **p<0.05; ***p<0.01. All the models include school fixed effects and clustered standard errors at the class level.

Table 6. Heterogeneity analysis: the effects of FE material on post-test score for different individual-level regressors - Grade 5

	Dependent variable:			
	Post-test score			
	(1)	(2)	(3)	(4)
Treatment A	0.067***	0.044	0.086***	0.074*
	(0.025)	(0.029)	(0.033)	(0.043)
Treatment B	−0.034	−0.045	−0.020	−0.025
	(0.026)	(0.029)	(0.028)	(0.037)
Treatment A:Female	0.010			
	(0.034)			
Treatment B:Female	0.048			
	(0.033)			
Treatment A:ESCS		0.061*		
		(0.034)		
Treatment B:ESCS		0.071**		
		(0.032)		
Treatment A:Mean *INVALSI* Math-Ita			−0.027	
			(0.031)	
Treatment B:Mean *INVALSI* Math-Ita			0.016	
			(0.027)	
Treatment A:Class mean *INVALSI* Math-Ita				0.003
				(0.071)
Treatment B:Class mean *INVALSI* Math-Ita				0.030
				(0.062)
Controls	X	X	X	X
Observations	639	639	639	639
R^2	0.446	0.449	0.445	0.443

Note: *p<0.1; **p<0.05; ***p<0.01. All the models include school fixed effects and clustered standard errors at the class level. Control variables include: pre-test score, female, foreign, ESCS, pre-test patience, pre-test saving, mean INVALSI Math-Ita, class mean INVALSI Math-Ita, students per class. ESCS, mean INVALSI Math-Ita and class mean INVALSI Math-Ita have been dichotomized by a median split.

Table 7. Heterogeneity analysis: the effects of FE material on post-test score for different individual-level regressors - Grade 8

	Dependent variable:			
	Post-test score			
	(1)	(2)	(3)	(4)
Treatment A	0.083***	0.090***	0.086***	0.082***
	(0.019)	(0.015)	(0.022)	(0.025)
Treatment B	−0.006	−0.008	0.009	0.026
	(0.022)	(0.017)	(0.022)	(0.026)
Treatment A:Female	0.007			
	(0.022)			
Treatment B:Female	0.028			
	(0.021)			
Treatment A:ESCS		−0.003		
		(0.017)		
Treatment B:ESCS		0.036*		
		(0.020)		
Treatment A:Mean *INVALSI* Math-Ita			0.001	
			(0.028)	
Treatment B:Mean *INVALSI* Math-Ita			−0.002	
			(0.025)	
Treatment A:Class mean *INVALSI* Math-Ita				0.002
				(0.032)
Treatment B:Class mean *INVALSI* Math-Ita				−0.041
				(0.035)
Controls	X	X	X	X
Observations	899	899	899	899
R^2	0.211	0.213	0.210	0.213

Note: *p<0.1; **p<0.05; ***p<0.01. All the models include school fixed effects and clustered standard errors at the class level. Control variables include: pre-test score, female, foreign, ESCS, pre-test patience, pre-test saving, mean INVALSI Math-Ita, class mean INVALSI Math-Ita, students per class. ESCS, mean INVALSI Math-Ita and class mean INVALSI Math-Ita have been dichotomized by a median split.

Table 8. Treatment effect on reweighted post-test score and delta score - Grade 5

	Dependent variable:	
	Post-test score	Delta score
	(1)	(2)
Pre-test score	0.237***	
	(0.040)	
Treatment A	0.055***	0.089***
	(0.015)	(0.029)
Treatment B	−0.013	−0.012
	(0.014)	(0.031)
Female	0.007	0.001
	(0.008)	(0.014)
Foreign	−0.036***	−0.051**
	(0.012)	(0.021)
ESCS	0.002	0.007
	(0.004)	(0.007)
Mean INVALSI Math-Ita	0.001***	−0.0002
	(0.0002)	(0.0003)
Class mean INVALSI Math-Ita	0.0003	−0.001
	(0.0004)	(0.001)
Students per class	−0.0001	0.0003
	(0.003)	(0.009)
Pre-test patience	−0.009	−0.025
	(0.008)	(0.015)
Pre-test saving	−0.004	0.001
	(0.009)	(0.022)
Observations	639	639
R^2	0.507	0.284
Adjusted R^2	0.486	0.255
Residual Std. Error	0.092 (df = 612)	0.189 (df = 613)

Note: *p<0.1; **p<0.05; ***p<0.01. Both the models include school fixed effects and clustered standard errors at the class level.

Table 9. Treatment effect on reweighted post-test score and delta score - Grade 8

	Dependent variable:	
	Post-test score	Delta score
	(1)	(2)
Pre-test score	0.289***	
	(0.046)	
Treatment A	0.080***	0.085***
	(0.011)	(0.014)
Treatment B	0.018	0.037**
	(0.013)	(0.016)
Female	0.006	0.031**
	(0.007)	(0.012)
Foreign	−0.004	0.001
	(0.012)	(0.023)
ESCS	0.003	−0.005
	(0.003)	(0.006)
Mean INVALSI Math-Ita	0.001***	−0.001***
	(0.0001)	(0.0002)
Class mean INVALSI Math-Ita	0.001	−0.001
	(0.001)	(0.001)
Students per class	0.001	−0.007**
	(0.002)	(0.003)
Pre-test patience	0.018**	0.014
	(0.008)	(0.014)
Pre-test saving	0.002	−0.022
	(0.009)	(0.014)
Observations	899	899
R^2	0.363	0.152
Adjusted R^2	0.342	0.125
Residual Std. Error	0.107 (df = 869)	0.182 (df = 870)

Note: *p<0.1; **p<0.05; ***p<0.01. Both the models include school fixed effects and clustered standard errors at the class level.

Table 10. List of teachers' variables

Variable	**Description**	**Value/range**
Individual characteristics		
Female	If the teacher is a female	1 or 0
Age	Teacher's age in six age groups	from 25 or less to 66 or more
Financial behaviors		
Dealt with fin. topics	If the teacher has already dealt with economic and financial topics in his/her classes	1 or 0
Digitalization	If the teacher either manages his/her current account online or use digital payments	1 or 0
CA only	If the teacher left all his/her last year's savings in the current account	1 or 0

Table 11. Descriptive statistics - Grade 5 teachers

Variable	**A**	**B**	**C**
Female	11 (85%)	6 (100%)	8 (100%)
Age			
25 or less	0 (0%)	1 (17%)	0 (0%)
26-35	2 (15%)	0 (0%)	0 (0%)
36-45	2 (15%)	2 (33%)	1 (12%)
46-55	2 (15%)	0 (0%)	3 (38%)
56-65	7 (54%)	3 (50%)	3 (38%)
66 or more	0 (0%)	0 (0%)	1 (12%)
School experience (in years)			
5 or less	1 (7.7%)	1 (17%)	0 (0%)
6-10	2 (15%)	0 (0%)	2 (25%)
11-20	3 (23%)	1 (17%)	0 (0%)
21-30	4 (31%)	3 (50%)	4 (50%)
31 or more	3 (23%)	1 (17%)	2 (25%)
Dealt with fin. topics	4 (31%)	2 (33%)	2 (25%)
Digitalization	7 (54%)	2 (33%)	3 (38%)
CA only	5 (38%)	2 (33%)	5 (62%)
N	13	6	8

Note: both dummy and categorical variables are represented as frequencies and percentages.

Table 12. Descriptive statistics - Grade 8 teachers

Variable	**A**	**B**	**C**
Female	11 (73%)	7 (88%)	7 (100%)
Age			
26-35	1 (6.7%)	1 (12%)	1 (14%)
36-45	4 (27%)	0 (0%)	2 (29%)
46-55	7 (47%)	5 (62%)	2 (29%)
56-65	3 (20%)	2 (25%)	2 (29%)
School experience (in years)			
5 or less	4 (27%)	0 (0%)	1 (14%)
6-10	3 (20%)	4 (50%)	1 (14%)
11-20	5 (33%)	3 (38%)	3 (43%)
21-30	1 (6.7%)	1 (12%)	2 (29%)
31 or more	2 (13%)	0 (0%)	0 (0%)
Dealt with fin. topics	2 (13%)	3 (38%)	1 (14%)
Digitalization	9 (60%)	3 (38%)	4 (57%)
CA only	7 (47%)	3 (38%)	2 (29%)
N	15	8	7

Note: both dummy and categorical variables are represented as frequencies and percentages.

Table 13. Treatment effect on post-test score (teacher-level variables included) - Grade 8

	Dependent variable:		
	Post-test score		
	(1)	(2)	(3)
Pre-test score	0.229***	0.224***	0.224***
	(0.058)	(0.059)	(0.059)
Treatment A	0.068***	0.067***	0.067***
	(0.016)	(0.017)	(0.017)
Treatment B	0.039**	0.029	0.029*
	(0.017)	(0.018)	(0.018)
Female	−0.00001	−0.001	−0.001
	(0.011)	(0.011)	(0.011)
Foreign	0.005	0.005	0.005
	(0.020)	(0.020)	(0.020)
ESCS	−0.003	−0.002	−0.003
	(0.007)	(0.007)	(0.007)
Mean INVALSI Math-Ita	0.001***	0.001***	0.001***
	(0.0002)	(0.0002)	(0.0002)
Class mean INVALSI Math-Ita	−0.001	−0.001	−0.001
	(0.001)	(0.001)	(0.001)
Students per class	0.007**	0.007**	0.007**
	(0.003)	(0.003)	(0.003)
Pre-test patience	0.021	0.021	0.021
	(0.014)	(0.014)	(0.014)
Pre-test saving	0.001	0.001	0.001
	(0.015)	(0.015)	(0.015)
Dealt with fin topics	−0.021	−0.024	−0.025
	(0.017)	(0.018)	(0.017)
Digitalization		−0.018	−0.018
		(0.016)	(0.017)
CA only			−0.001
			(0.023)
Observations	533	533	533
R^2	0.269	0.270	0.270

Note: *p<0.1; **p<0.05; ***p<0.01. All the models include school fixed effects and clustered standard errors at the class level.

Table 14. Heterogeneity analysis: the effects of FE material on post-test score for different teacher-level regressors - Grade 8

	Dependent variable:		
	Post-test score		
	(1)	(2)	(3)
Treatment A	0.046**	0.023	0.069*
	(0.019)	(0.023)	(0.037)
Treatment B	0.055***	0.039	0.031
	(0.019)	(0.024)	(0.022)
Treatment A:Dealt with fin. topics	0.169**		
	(0.078)		
Treatment B:Dealt with fin. topics	−0.071		
	(0.083)		
Treatment A:Digitalization		0.077**	
		(0.033)	
Treatment B:Digitalization		−0.015	
		(0.041)	
Treatment A:CA only			−0.008
			(0.096)
Treatment B:CA only			−0.005
			(0.046)
Controls	X	X	X
Observations	533	533	533
R^2	0.279	0.279	0.270
Adjusted R^2	0.234	0.234	0.225
Residual Std. Error (df = 501)	0.137	0.137	0.138

Note: *p<0.1; **p<0.05; ***p<0.01. All the models include school fixed effects and clustered standard errors at the class level. Control variables include: pre-test score, female, foreign, ESCS, pre-test patience, pre-test saving, mean INVALSI Math-Ita, class mean INVALSI Math-Ita, students per class, "dealt with fin. topics", "digitalization", "CA only".

Table 15. Treatment effect on post-test score with high- and low-intensity Treatment A - Grade 8

	Dependent variable:			
	Post-test score			
	(1)	(2)	(3)	(4)
Pre-test score	0.277***	0.237***	0.238***	0.230***
	(0.046)	(0.054)	(0.054)	(0.056)
Treatment A1	0.105***	0.105***	0.117***	0.107***
	(0.014)	(0.016)	(0.016)	(0.014)
Treatment A2	0.047**	0.048**	0.046**	0.047**
	(0.019)	(0.020)	(0.018)	(0.019)
Treatment B	0.050***	0.050**	0.048***	0.040**
	(0.019)	(0.021)	(0.018)	(0.016)
Female	0.005	0.002	0.001	0.001
	(0.011)	(0.011)	(0.011)	(0.011)
Foreign	−0.006	0.004	0.006	0.004
	(0.021)	(0.021)	(0.021)	(0.020)
ESCS	0.002	−0.004	−0.004	−0.005
	(0.006)	(0.007)	(0.007)	(0.007)
Mean INVALSI Math-Ita		0.001***	0.001***	0.001***
		(0.0002)	(0.0002)	(0.0002)
Class mean INVALSI Math-Ita			−0.001**	−0.001**
			(0.001)	(0.001)
Students per class				0.005*
				(0.003)
Pre-test patience				0.021
				(0.014)
Pre-test saving				−0.001
				(0.016)
Observations	533	533	533	533
R^2	0.250	0.265	0.268	0.273
Adjusted R^2	0.218	0.231	0.233	0.234
Residual Std. Error	0.138 (df = 510)	0.137 (df = 509)	0.137 (df = 508)	0.137 (df = 505)

Note: *p<0.1; **p<0.05; ***p<0.01. Treatment A students have been split in two different groups: one receiving an extended FE course lasting more than 9 hours (Treatment A1), and the other receiving a shorter FE course lasting less than 9 hours (Treatment A2). All the models include school fixed effects and clustered standard errors at the class level.

Appendix 1 - Questionnaires

In this section we report, for the sake of illustration, the pre-test that was administered to both primary and lower secondary school students. Original post-tests (in Italian) for both grades and English translations of all tests are available upon requests from the authors.

Scuola Primaria

Test iniziale

spazio per codice identificativo

BANCA D'ITALIA
EUROSISTEMA

Progetto *Educazione Finanziaria nelle scuole*

Caro/a studente/ssa,
ti invitiamo a compilare questo questionario.

TUTTI PER UNO ECONOMIA PER TUTTI!



Grafica e stampa a cura della Divisione Editoria e stampa della Banca d'Italia

Prima Parte

D1. Ordina le seguenti azioni: **lavorare - guadagnare - studiare - spendere** da quella che si fa prima a quella che si fa dopo. Inseriscile nella seguente linea del tempo.

Prima:	*Seconda:*	*Terza:*	*Quarta:*
.....	.....	.....	.....



D2. Collega con una freccia ogni soggetto (nella colonna di sinistra) con la sua tipologia di reddito (nella colonna di destra).

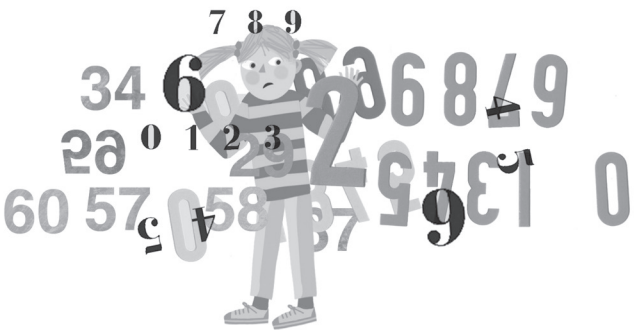
Soggetto	**Tipologia di reddito**
Chi possiede azioni	Reddito d'impresa
Avvocato	Reddito da capitale
Chi possiede una società di costruzioni	Reddito da lavoro dipendente
Insegnante	Reddito da lavoro autonomo

D3. Per soddisfare un bisogno o realizzare un desiderio a volte dobbiamo sostenere una spesa; indica con una **X** quali dei seguenti acquisti sono bisogni e quali desideri.



	Bisogno	**Desiderio**
Regalo a un amico		
Tre succhi di frutta per merenda		
Pranzo a mensa		
Vestiti alla moda		
Cellulare di ultima generazione		
Libri di testo		

D4. In questa settimana hai ricevuto una **paghetta** di **10 €**, hai comprato un **fumetto** che costava **5 €,** mentre la **merenda** che hai fatto con i tuoi compagni è costata **7 €**. Infine, la **zia** ti ha dato **15 €**, e quindi hai deciso di comprare il **gioco** che tanto desideravi, al costo di **14 €**. Di seguito trovi una lista delle tue voci di spesa e di guadagno per questa settimana.



Voci di spesa e guadagno
Paghetta 10 €
Fumetto 5 €
Merenda 7 €
Regalo della zia 15 €
Gioco 14 €

Completa ora la tabella seguente, inserendo le spese nella colonna delle uscite e i guadagni nella colonna delle entrate (la paghetta è già stata inserita); poi, somma tutte le entrate e tutte le uscite.

Ora completa tu…



Entrate	Uscite
Paghetta 10 €	
TOTALE ENTRATE: . . . . . **€**	**TOTALE USCITE:** . . . . . **€**

D5. Dopo aver compilato la tabella rispondi alle seguenti domande.

Attenzione: il saldo è in attivo se il totale delle entrate è maggiore del totale delle uscite.

- Il saldo è in attivo o in passivo? ……
- Di quanto? …… €
- Hai la possibilità di tornare indietro e modificare le tue scelte. A cosa rinunceresti tra il fumetto, la merenda e il gioco? ……

D6. Lo Stato usa le tasse pagate dai cittadini per fornire loro beni e servizi. Indica se ciascuna delle seguenti affermazioni è vera (**V**) o falsa (**F**).

	V	F
La pizzeria è un servizio fornito dallo Stato		
La scuola è un servizio fornito dallo Stato		
Pagare le tasse è facoltativo		
Tutti devono pagare lo stesso importo di tasse		
Chi guadagna di più deve pagare più tasse		

Seconda Parte

D7. Ci sono almeno due buoni motivi per risparmiare: per realizzare un desiderio o per poter affrontare una spesa imprevista. Leggi la conversazione tra Giulia ed Edoardo e indica con una **X** chi risparmia per realizzare un desiderio e chi per affrontare una spesa imprevista.

Giulia:	*"Sai, stavo pensando che dovrei iniziare a risparmiare qualcosa della mia paghetta…".*
Edoardo:	*"Fai bene: anche io ho iniziato tempo fa. Vorrei un monopattino. Ho fatto i calcoli e ci vuole solo un anno per mettere da parte la somma giusta!".*
Giulia:	*"Bravo Edoardo, ma se dovesse succedere un imprevisto durante quest'anno? Per esempio, potrebbe rompersi la tua bicicletta…".*
Edoardo:	*"Non ci avevo mai pensato, speriamo che non capiti… e tu invece per cosa vorresti iniziare a risparmiare?".*
Giulia:	*"Io vorrei iniziare a risparmiare per essere sicura di avere i soldi necessari se succede qualcosa di inaspettato…".*

Giulia risparmia per

- ◯ Realizzare un desiderio
- ◯ Poter affrontare una spesa imprevista

Edoardo risparmia per

- ◯ Realizzare un desiderio
- ◯ Poter affrontare una spesa imprevista

D8. Per correre pochi rischi dove conviene conservare i propri risparmi? Indica con una **X** la risposta corretta.

- ◯ Tutti in banca depositati su un conto corrente
- ◯ In parte depositati su un conto corrente e in parte investiti in azioni
- ◯ Tutti investiti in azioni

D9. Indica se ciascuna delle seguenti affermazioni è vera (**V**) o falsa (**F**).

	V	F
L'interesse che si paga su un prestito dipende dal tempo trascorso		
L'interesse che si paga su un prestito non dipende dalla somma ricevuta		
L'interesse che si paga su un prestito è uguale per tutti		

Dicci qualcosa in più su di te

Nelle domande seguenti non esistono risposte giuste o sbagliate. Scegli in base alle tue preferenze.

a. Per ogni coppia di alternative indica con una **X** quella che preferisci.

- ◯ Ricevere 10 figurine oggi
- ◯ Ricevere 11 figurine tra una settimana

- ◯ Ricevere 10 figurine oggi
- ◯ Ricevere 15 figurine tra una settimana

- ◯ Ricevere 10 figurine oggi
- ◯ Ricevere 20 figurine tra una settimana

b. Se ricevi 50 € a Natale, quale uso ne fai nel mese successivo? Indica con una **X** la risposta che ti rappresenta di più.

- ◯ Li spendo tutti
- ◯ Ne risparmio la maggior parte
- ◯ Ne risparmio una piccola parte
- ◯ Li risparmio tutti

Grazie mille per aver compilato questo questionario!

Scuola Secondaria di primo grado

Test iniziale

spazio per codice identificativo

BANCA D'ITALIA
EUROSISTEMA

Progetto *Educazione Finanziaria nelle scuole*

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ti invitiamo a compilare questo breve questionario.

TUTTI PER UNO ECONOMIA PER TUTTI!



Grafica e stampa a cura della Divisione Editoria e stampa della Banca d'Italia

Prima Parte

D1. Associa il soggetto con la sua tipologia di reddito (scegli, per ogni riga, una sola opzione tra le tipologie di reddito).

Tipologia di reddito / *Soggetto*	Reddito d'impresa	Redditi diversi	Reddito fondiario	Reddito da lavoro dipendente	Reddito da capitale	Reddito da lavoro autonomo
Insegnante						
Dentista						
Proprietario di una società edile						
Chi possiede delle azioni						
Proprietario di un appartamento dato in affitto						
Vincitore di un quiz televisivo						

D2. Immagina che queste siano le voci del tuo bilancio della scorsa settimana. Indica per ciascuna di esse se rappresenta un'entrata (+) o un'uscita (-).

	+ (entrata)	*- (uscita)*
Paghetta ricevuta per aver fatto una commissione: 10 €		
Ricarica telefonica: 5 €		
Merenda: 7 €		
Regalo da tua zia: 20 €		
Acquisto di un videogame: 12 €		

D3. Alla fine della scorsa settimana il tuo bilancio era in attivo o in passivo?

- ○ Attivo
- ○ Passivo

D4. Facendo riferimento al bilancio della settimana scorsa, qual è il saldo, cioè la differenza tra entrate e uscite?

..... €

D5. Parliamo di tasse. Indica se ciascuna delle seguenti affermazioni è vera (V) o falsa (F).

	V	*F*
Lo Stato utilizza le tasse per fornire tutti i servizi, inclusi ad esempio i ristoranti		
Al crescere del reddito, si pagheranno più tasse		
Solo i cittadini che usufruiscono dei servizi pubblici (come gli ospedali o le scuole) devono pagare le tasse		
Le tasse servono a finanziare importanti servizi pubblici come la pulizia delle strade e la sicurezza tramite la polizia		

D6. Indica se ciascuna delle seguenti affermazioni è vera (V) o falsa (F).

	V	*F*
Il budget serve per tener conto delle spese effettuate		
Sarebbe bene che il budget comprendesse una voce per il risparmio		
Nel budget rientrano le spese effettuate da altri (es. dai propri amici)		
Risparmiare oggi può servire per soddisfare un desiderio più avanti nel tempo		

Seconda Parte

D7. Indica se ciascuna delle seguenti affermazioni è vera (V) o falsa (F).

	V	*F*
Se possiedo una somma di denaro che voglio investire, la soluzione migliore è il conto corrente		
Le obbligazioni sono titoli emessi da banche, imprese o Stati per "vendere" il proprio debito		
Investire in azioni garantisce la restituzione dell'intera somma investita		

D8. Gli interessi possono essere attivi o passivi. Nei due esempi sotto riportati, indica con una X se gli interessi sono attivi o passivi.

	Interessi attivi	*Interessi passivi*
Franco acquista obbligazioni di una società e ottiene		
Franco ottiene un prestito dalla banca e deve pagare		

D9. Indica se ciascuna delle seguenti affermazioni è vera (V) o falsa (F).

	V	*F*
Se l'interesse ricevuto su un'obbligazione è minore, il rischio di perdere il denaro è minore		
Se l'interesse ricevuto su un'obbligazione è minore, il rischio di perdere il denaro è maggiore		
Se l'interesse ricevuto su un'obbligazione è maggiore, il rischio di perdere il denaro è minore		
Se l'interesse ricevuto su un'obbligazione è maggiore, il rischio di perdere il denaro è maggiore		

D10. Supponi di investire 120 € a un tasso d'interesse del 3% annuo. Dopo un anno, quanti soldi avrai, considerando il capitale iniziale?

- ○ 120,3 €
- ○ 123,6 €
- ○ 123,0 €
- ○ 126,3 €

Dicci qualcosa in più su di te

Nelle domande seguenti non esistono risposte giuste o sbagliate. Scegli in base alle tue preferenze.

a. Se ricevi 50 € a Natale, quale uso ne fai il mese successivo? Indica con una X la risposta che ti rappresenta di più.

- ○ Li spendo tutti insieme per qualcosa che desideravo da tempo
- ○ Li spendo un po' per volta
- ○ Ne conservo una parte e spendo il resto
- ○ Li metto tutti da parte

b. Per ogni coppia di alternative indica con una X quella che preferisci.

- ○ Ricevere 10 euro oggi
- ○ Ricevere 11 euro tra un mese

- ○ Ricevere 10 euro oggi
- ○ Ricevere 15 euro tra un mese

- ○ Ricevere 10 euro oggi
- ○ Ricevere 20 euro tra un mese

Grazie per il tempo che hai dedicato alla compilazione di questo questionario!