

The Impact of School-Based Financial Education on High School Students and their Teachers: Experimental Evidence from Peru

Veronica Frisancho*

January 2018

Abstract

Using data from a randomized controlled trial in 300 public high schools in Peru, I study the potential of school-based financial education programs for the youth. The intervention improves students' financial knowledge by 0.14 SD, an effect size in line with similar interventions in other settings. In contrast to the limited impact identified previously for adult financial education programs, the intervention improves teachers' financial literacy by 0.32 SD. The impact of the intervention also extends to socioemotional traits and behavior. I identify sizable positive impacts on self-control and consumption habits among students. Teachers in the treatment group report greater levels of impulsiveness and risk aversion. They are also more likely to save (9 percentage points) and to save formally (14 percentage points). Focusing on the impact on student financial literacy, novel data on costs yields a low cost-effectiveness ratio of 0.021.

*Inter-American Development Bank, Research Department. 1300 New York Ave. NW, Washington, DC 20577. E-mail: vfrisancho@iadb.org.

1 Introduction

Financial literacy has become a popular prescription to promote greater levels of financial inclusion. However, most of the evidence suggests that financial education interventions among adults have limited, if not null, effects on literacy and financial behavior [Fernades et al., 2014; Miller et al., 2014]. This discouraging result can be in part explained by low participation and attendance rates, a common issue in most training programs targeting adults, but it may also respond to a limited degree of malleability of adults' preferences and financial habits.

More recently, governments, non-profits, and financial institutions have been promoting the development of more comprehensive National Financial Inclusion Strategies with a strong financial literacy component [OECD/INFE, 2015]. The emphasis, however, goes beyond the former remedial approach, focusing only on adults at risk of making poor financial choices, and includes children and the youth by fostering school-based financial literacy. Focusing on younger audiences may minimize the limitations faced when working with adults and thus offer greater potential for impact. On one hand, school-based programs offer the possibility of reaching a captive audience, minimizing participation issues. On the other hand, children and young adults are still developing habits; offering guidance at the right time may be crucial to influence their behavior later in life.

This study relies on a large-scale randomized controlled trial (RCT) implemented in 300 public schools in 6 regions of Peru to measure the effects of school-based financial education for high school students. The program, *Finanzas en mi Colegio*, targeted ages 14 through 16 by focusing on the last three grades of high school, which are equivalent to ninth, tenth, and eleventh grades in the US. Students were tested on their financial knowledge and surveyed both at baseline (May 2016) and at the end of the school year (December 2016). Survey data in both rounds included questions on personality traits related to financial behavior (intermediate outcomes) as well as on shopping and saving habits and expenditure patterns (final outcomes). Administrative records on student performance in all courses was also

obtained. Teachers' data come from an exit financial knowledge exam and an exit survey with questions on personality traits identical to those applied to students, but additional questions on financial attitudes and behavior.

This paper contributes to the empirical literature on financial education among the youth on several fronts. First, it provides experimental evidence for older children, which tends to be scarce.¹ Targeting high-school aged youth combines the benefits of reaching younger and more malleable populations as well as old enough agents who are at a higher risk of making important and long-lasting intertemporal decisions as they approach the end of secondary schooling. Second, this paper measures the impact of financial education on preferences and personality traits in addition to financial knowledge and behavior. Since teaching good financial habits usually requires touching upon topics such as intertemporal choices and trade-offs, I expect the program to influence individual intertemporal preferences, risk aversion and self-control levels, among others. Even though changes in adult behavior are more likely to take place as a consequence of changes in these intrinsic intermediate outcomes [Gathergood, 2012; Strömbäck et al., 2018], the literature has paid little attention to them.² Third, this is the first study that measures the effect of a school-based financial education on the teachers in charge of delivering knowledge. This can be informative about the potential impact of adult financial education programs under high exposure to the content through repetition, usage of more accessible materials, and coverage of a curriculum that follows a cumulative logic, covering broad topics as well as more specialized ones. Finally, this is also the first study on financial education that provides a cost-effectiveness analysis, which is particularly relevant to guide policy efforts trying to move from evidence into action.

Finanzas en mi Colegio has strong effects on the financial knowledge of young students.

Relative to baseline values in the control group, scores in a financial literacy exit exam go

¹The few notable exceptions are Becchetti and Pisani [2012], Bruhn et al. [2016], Eissa et al. [2014], and Bover et al. [2018].

²Three notable exceptions are Lührmann et al. [2015], who measure the impact of a financial education program on time inconsistency among German students; Jamison et al. [2014], who look at the impact of school-based financial education on discounting, self-control, and risk tolerance; and Bover et al. [2018], who analyses the degree of students' patience through an incentivized task.

up by 0.14 SD in the pooled sample, with significantly higher average gains among eleventh graders, the oldest cohort. This effect is large, especially in relation to Peru's performance in the 2015 PISA financial literacy assessment of 15-year old students, which placed the country next to last in a ranking of 15 countries. The impact of the intervention is equivalent to a 14.8-point improvement in the PISA exam, a gain that is equivalent to half the gap relative to the next country in the ranking.

These learning gains are not in detriment of student performance in other courses. Instead, the program seems to foster overall performance improvements as measured by end of the year cumulative grade point average (GPA). These performance gains amount to 0.18 SD and are similar across courses. Moreover, they subsist even when excluding the HGE course from cumulative GPA calculations. The program does not have effects on grade progression.

Beyond financial knowledge gains, three key important results are identified in the pooled sample. First, the level of self-control increases by 0.03 SD in the treatment group. This is a very promising and novel finding since only Jamison et al. [2014] has measured this outcome among the youth and was not able to identify any significant impact from a similar intervention. Second, the treatment leads to better consumption habits and greater levels of communication with parents on financial matters. There is a significant and positive effect on the shares of students who compare prices before shopping (1.2 percentage points), save instead of borrowing to buy something they cannot afford (1.3 percentage points), and talk to their parents about household financial decisions (1.1 percentage points). Third, the program modifies students' expenditure pattern, reducing the share of their budget destined to relatively more superfluous goods.

Additional impacts on preferences, socioemotional skills, and financial behavior vary by grade, in line with the grade-specific content provided. Ninth graders in the treatment group exhibit reduced levels of risk aversion (-0.03 SD), probably due to their exposure to concepts like investment and opportunity cost. They also significantly increase their level of involvement with financial choices in their households, with the share of students

who talk to their parents about financial decisions increasing by 2 percentage points. This is consistent with the budgeting lessons they received and highlights one potential avenue to foster trickle up effects in youth-targeted financial education programs. The curriculum received by tenth graders focused on financial products and services and intertemporal trade-offs. This content led to several changes in preferences and socioemotional traits that, taken together, suggest a more conservative and forward-looking attitude: they exhibit decreases in consciousness/deliberative thinking (0.04 SD), large improvements in self-control (0.06 SD), a higher share of risk averse individuals (1.8 percentage points), and a reduction in the share of hyperbolic discounters (1.8 percentage points). They also experience a modest increase in the probability of saving before buying something they cannot afford (2 percentage points), which is in tune with the impact identified on their preferences and personality traits. The material received by eleventh graders, which focused on overindebtedness, consumer protection, and financial information, led to increased levels of risk aversion (0.04 SD). It also helped students develop greater levels of financial autonomy (0.07 SD) and better saving and shopping habits; the share of students who compare prices, save, or bargain before shopping goes up by 2.4, 1.5, and 2.5 percentage points, respectively.

Finanzas en mi Colegio also improves teachers' performance in the financial knowledge exit exam by 0.32 SD. Although this result is not exactly comparable with existing evidence for adults, it is still encouraging as it shows that some adults may learn but under more intensive programs that rely on more accessible materials and that cover a broad curriculum with topics ranging from intertemporal choices and trade-offs to the workings of the financial system. The effect of the program also permeates to some of their personality traits: teachers in the treatment group have higher chances of being risk averse (7 percentage points) and they report greater levels of impulsiveness (0.14 SD). The treatment also leads to better savings habits among teachers: the probability that they save goes up by 9 percentage points. Interestingly, teachers disproportionately allocate savings to formal mechanisms, as is evident from the 14-percentage point increase in the probability of saving formally.

Overall, the findings in this study portray school-based financial education as a promising avenue to improve financial literacy among older children who are soon to be adults. Although the degree of the financial choices that the youth make is still limited while they are in school, the intervention was successful at generating positive changes in consumption habits in the short run. More importantly, the impact registered on preferences and personality traits that are related to financial choices suggests that intervening early may be a cost-effective strategy to promote further changes in financial behavior during adulthood.

2 Literature Review

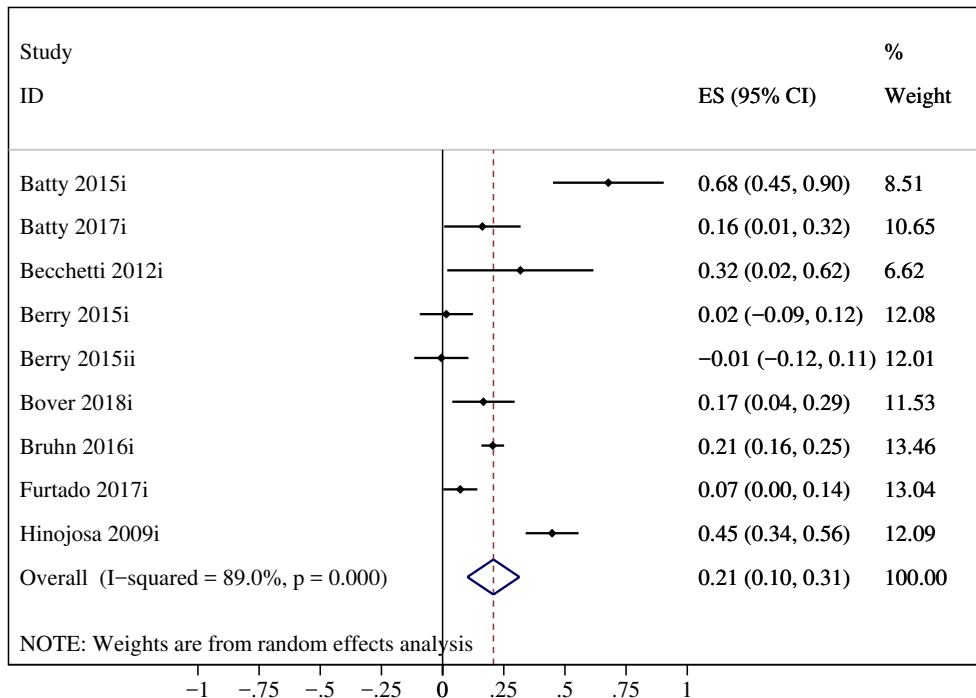
Rigorous empirical evidence on the impact of financial literacy programs for the youth is still scarce. After a thorough revision of the literature, only nine studies that rely on RCTs to measure the impact of financial education programs among school-age youth were identified.³ These studies come from diverse settings such as Italy, Spain, Ghana, Brazil, USA, and Kenya and target students from elementary, middle school, and/or high school. Most of the interventions in this sample of studies developed a school-based course with differential degree of exposure to the educational materials. After the information reported by these studies was coded, only eight with enough information to estimate comparable effect sizes survive. This final sample yields nine comparable effect sizes for financial knowledge.⁴

With this sample of studies, I conduct a random effects meta-analysis and find that financial education programs for the youth have a 0.21 SD average effect size, significant at the 95% confidence interval. In fact, only two of the nine evaluations are not able to reject the null hypothesis (see Figure 1). This is a very large impact, especially when compared to educational interventions aimed at improving academic performance in math and language in developing countries [McEwan, 2015].

³These studies are Becchetti and Pisani [2012], Berry et al. [2015], Bruhn et al. [2016], Batty et al. [2015], Batty et al. [2017], Jamison et al. [2014], Eissa et al. [2014], Furtado et al. [2017], and Bover et al. [2018].

⁴Effect sizes for this variable were included if they were measured in a continuous scale (score or index), which was the most common pattern in the sample. Whenever the outcome was not standardized to the

Figure 1: Effect Sizes on Financial Knowledge of RCTs Providing Financial Education



Even though the sample size is reduced to only four studies when focusing on high schoolers, the average effect size remains at 0.21 SD and highly significant. Focusing only on interventions that provided school-based courses yields an average effect size of 0.23 SD.

All in all, the results from the meta-analysis suggest that financial education for the youth is a very promising avenue. However, beyond a few studies in the sample that collect comparable outcomes on saving attitudes and behavior, there is very limited measurement of the impact on other outcomes, specially those that may channel changes in future consumption and saving patterns. In particular, Strömbäck et al. [2018] shows that people with good self-control are more likely to save and exhibit better financial behavior. Similarly, Gathergood [2012] provides evidence on the positive association between lack of self-control and over-indebtedness levels in the UK. In fact, the author finds that self-control has a stronger role in poor credit outcomes than financial literacy. Although auto-regulation is

mean and standard deviation of the control at baseline, we calculate Cohen's d (see Ringquist [2013]).

harder to influence during adulthood, evidence from the psychology literature shows that this trait has higher malleability at young ages [Henrichs and Van den Bergh, 2015]. Despite the potential to have an impact on this behavioral trait when targeting children, only Jamison et al. [2014] measured the effect of financial education on this construct. One of the main contributions of the paper is measuring the impact of financial education on a set of preferences and personality traits that are likely to influence financial behavior today as well as in the future.

3 Experimental Design

3.1 The Intervention: *Finanzas en mi Colegio*

In 2015, the Peruvian government launched the National Financial Inclusion Strategy [Comisión Multisectorial de Inclusion Financiera, 2015]. One of the seven lines of action of the strategy is financial education but considered as a process of continuous learning throughout the life cycle and not only as a remedial intervention for adults. Correspondingly, one of the high priority goals in the plan of action is to provide financial education to all primary and secondary students by 2021.

Under these guidelines, the Ministry of Education (MINEDU) partnered up with the Superintendency of Banks and Insurance (SBS) and the Center of Studies (CEFI) from the Peruvian Association of Banks to develop a pilot that aimed at providing financial education to high school students. Together, they developed student workbooks for each of the three target grades as well as a teacher’s guide. The team also designed and implemented a 20-hour teacher training plan which included a training component on the financial literacy contents as well as a pedagogical one. The first component of the teachers’ training was delivered in four sessions by the SBS while MINEDU and CEFI provided the pedagogical component in one additional session.⁵ MINEDU was also in charge of overseeing and monitoring the

⁵The content of the pedagogical session included a review of the background of the program, including

actual implementation of the financial literacy lessons.

The content of the workbooks is cumulative over grades. The lessons provided to ninth graders focused on the differences between needs and resources and budgeting. The lessons imparted to tenth graders focused on financial products and services while the curriculum for eleventh grade covered the topics of responsible financial consumer and access to information in financial markets (see Table A.1 for a complete list of the lessons by grade).

The delivery of the sessions in schools was in charge of the HGE teachers, who were instructed to incorporate the material in the Economics portion of the course. MINEDU encouraged HGE teachers to attend the training sessions conducted before the school year started. School principals were requested to facilitate teacher participation in the training. Participants received both a transport subsidy (mostly in kind) and a full meal during the workshop. To increase compliance, some of the trained teachers were instructed to replicate the workshop to reach teachers who were not previously trained.

3.2 Study Timeline

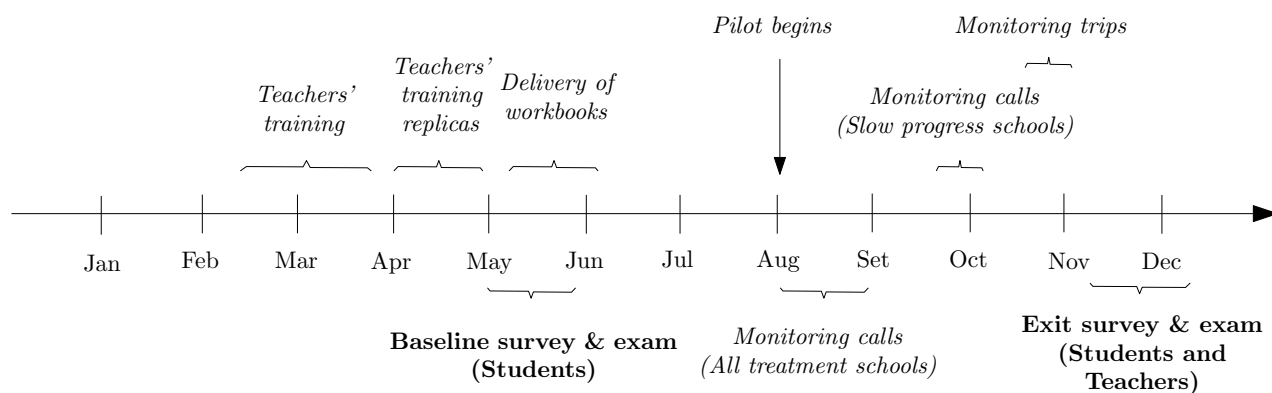
Figure 2 organizes both the intervention activities (in italics) as well as the evaluation activities (in bold) that took place during the 2016 calendar year. Teachers' training workshops were conducted between mid February and March, before the beginning of the school year. Replica sessions were schedule during the first month of classes.

Students' workbooks were delivered to the schools between May and April. The pilot was launched in 150 public schools from 6 regions in the country during the second half of the 2016 school cycle, August through December. Two monitoring efforts were conducted once the pilot was launched. First, MINEDU called all treatment schools to record the progress by grade. Second, between the end of October and beginning of November, CEFI reached all schools that reported to be delayed during the first monitoring round. A few monitoring trips were conducted in late October by SBS and MINEDU to collect qualitative information

the launching of the National Financial Inclusion Strategy, as well as the use of teaching tools such as charts, figures, and case studies.

on the opinions of the principals, teachers, and students about the pilot activities.

Figure 2: Study Timeline



Students' baseline surveys and financial literacy entry exams were collected simultaneously during May and were self-administered. Both exit surveys and exams for students and teachers were applied between the second week of November and the first week of December and were also self-administered. All data collection efforts were conducted once the Chesapeake Institutional Review Board (IRB) determined that the evaluation activities were exempt from IRB oversight.

3.3 Data and Measurement

The data used in the analysis of students' outcomes come from three sources: survey data collected before and after the pilot was implemented, exam scores collected at entry and exit, and administrative records on student performance at the end of the year. Data for teachers come from exit survey and exam.

3.3.1 Surveys

The student baseline survey collects some basic information on socioeconomic characteristics of the household. It also collects information on students' future aspirations, parental supervision, truancy, and the number of hours the student works per week. The questionnaire also

collects information on five personality constructs and preferences which, a priori, I suspect may influence financial choices: conscientiousness, self-control, intertemporal preferences, impulsiveness and venturesomeness, and risk aversion. Conscientiousness, which is closely related to deliberative thinking, was measured using the Big Five Scale for this attribute [Pervin and John, 1999]. Self control is measured by Tangney et al. [2004]’s scale while impulsiveness is measured by the Barratt Impulsiveness Scale (BIS-11) [Orozco-Cabal et al., 2010]. Time inconsistency is defined as in Ashraf et al. [2006].

The baseline survey also collects data on previous exposure to financial education programs and self-evaluation of math skills, financial knowledge, and pro-saving behavior [Mandell and Klein, 2009]. The baseline survey measured financial behavior on several fronts: cash flows, formal savings, budgeting, participation in household financial decisions, consumption and saving habits, and financial autonomy as measured in Bruhn et al. [2016]. Note that the instruments used at endline were exactly the same as the ones used at baseline; only the questions related to socioeconomic characteristics were removed.

The endline questionnaire applied to teachers was very similar to the students’ instrument. Additional questions included were related to teachers’ professional background and experience, as well as to their monthly household income and formal and informal savings.

3.3.2 Exams

All grade-specific exams consisted of 15 questions. Four questions were drawn from the 2008 National Jump\$start Coalition Survey of High School Seniors and College Students on the topics of risk, return and liquidity; intertemporal spending choices; budgeting to save; and the importance of investing in skills and education.⁶ The remaining questions tested students

⁶See Mandell [2009]. The Jump\$start Coalition for Personal Financial Literacy is a US non-profit coalition of 150 organizations that tries to promote financial literacy among students. Its target population includes students between pre-kindergarten and all the way through college. Jump\$start publishes the National Standards in K-12 Personal Finance Education, which delineate the personal finance knowledge and ability that young people should acquire during their schooling years between kindergarten and 12th grade. Since 2000, Jump\$start has administered the Survey of Personal Financial Literacy among high school students. In 2008, the survey extended its coverage to college students.

on the specific topics covered in each grade-specific workbook. Most questions were drawn from the teacher entry exam designed by the SBS and CEFI⁷ but a few were developed independently to cover topics included in the materials but excluded from the teacher exam. The same exam was administered at baseline and endline.

The exit exam taken by teachers was developed by the author and included the four questions from the Jump\$start questionnaire, four questions from the ninth grade exam, four questions from the tenth grade exam, and three questions from the eleventh grade exam. Appendix B presents students' and teachers' exams.

3.3.3 Administrative records

MINEDU provided administrative records for all the students enrolled in high school in 2016 in any of the 300 schools of the experimental sample. The records contain basic information such as birth date and place, place of residence, and enrollment status at the beginning of the 2016 academic year. The records also include cumulative GPAs by course at the end of the 2016 academic year as well as variables indicating if the student passed the grade during the regular academic year or after taking extraordinary exams.

3.4 Sample Selection and Randomization

The universe of interest was restricted to full-day public high schools in urban areas in Lima and Callao, Arequipa, Piura, Junin, Puno, and San Martin.⁸ Due to logistic reasons, the universe was further restricted to Local Education Management Units (UGEL, for its acronym in Spanish) which were sufficiently close to cities and with a high number of schools under its supervision. After imposing some additional restrictions (directly managed by the MINEDU, single grade schools, and number of students in each grade above the 5th percentile and below the 95th percentile), the final universe included 308 schools.

⁷SBS and CEFI developed and entry exam but it was only taken by teachers in the treatment group who attended at least one of the training sessions.

⁸The focus on full-day schools intends to minimize the effect of substituting time away from other courses.

To establish the number of schools required for the evaluation, a power calculation was performed with the following parameters: significance level of 0.05, statistical power of 0.8, minimum detectable effect of 0.1 SD, R^2 of the outcome equation of 0.1, intra-cluster correlation of 0.1, and a sample size of 40 students per grade. Under these assumptions, about 300 schools were required, 150 in each treatment arm.

The restricted universe was stratified by region. Following Bruhn and McKenzie [2009], we paired schools by their similarity within each of the six strata.⁹ This pairing procedure left us with 150 matched pairs where each school was randomly assigned to one of the treatment arms. Provided that non-compliance is orthogonal to the magnitude of the treatment impact, this design allow us to exclude from the analysis a pair of schools with at least one non-complier or non-respondent, without affecting the balance across treatment arms.

Within each school in the experimental sample, one classroom from each grade was chosen at random to be interviewed and tested at baseline and endline. The baseline sample consists of 20,908 students (7,097, 6,927, and 6,884 in ninth, tenth, and eleventh grade, respectively). On average, the initial sample size per classroom is 25 students.

The exit survey and exam were applied to 19,735 students (6,720, 6,591, and 6,424 in ninth, tenth, and eleventh grade, respectively). Only 16,735 students were present in both data collection rounds. The attrition rate is 20% but it is not differential by treatment status. In turn, we have a 98% success rate when matching students across survey data and academic records. The final sample of matched students across all the data sources consists of 16,443 students (5,654, 5,415, and 5,374 in ninth, tenth, and eleventh grade, respectively).

Tables A.2 and A.3 in Appendix A provide basic descriptive statistics at the school and student level as well as balancing tests of the randomization. Consistent with the random treatment assignment, no significant differences are detected across groups.

⁹We minimize the Mahalanobis' distance for ten selected characteristics: electricity connection; water and drainage services availability; presence of a principal; number of desks in good condition; number of teachers; number of students in ninth, tenth, and eleventh grades; dropout rate; pass rate; whether it belongs to the original sample chosen by CEFI in 2015; and whether it belongs to the experimental sample of any other ongoing pilot.

3.5 Empirical Specification

The impact of *Finanzas en mi Colegio* on different outcomes is measured as the difference across treatment arms, captured from an intention-to-treat, OLS regression:

$$y_{ijp} = \alpha + \beta T_{jp} + \gamma y_{ijp}^{\text{pre}} + \delta X_{ijp} + \sum_p \theta_p d_{jp} + \epsilon_{ijp} \quad (1)$$

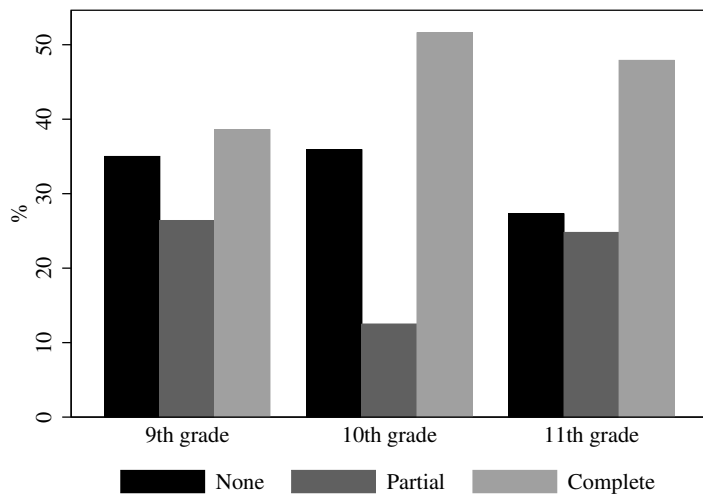
where y_{ijp} could be financial knowledge, socioemotional traits, preferences, or behavior of student/teacher i in school j from pair p . The regressor y_{ijp}^{pre} , the baseline value of y_{ijp} , is only included in the case of students' outcomes from the survey. The impact of the treatment is measured by β , the coefficient on the indicator of treatment status, T_{jp} . All regressions include additional students' or teachers' characteristics as controls, X_{ijp} , and a set of dummies, d_{jp} , identifying the pair of schools matched. We exclude from the analysis all pairs with at least one school without available data at endline.

The intervention had limited compliance levels within the treatment group (see subsection 3.6) but no teacher in the control group attended the training workshops and no student from the control group received the lessons or the workbooks. For each grade, I define compliance at the school level by a dummy variable, Z_{jp} , that equals one if at least one of the teachers attended one or more of the training sessions. I rely on this measure of compliance for two reasons. First, it is an objective measure, based on the attendance records kept by the MINEDU and SBS. Teachers' self-report of the coverage of lessons in class (see Section 3.6) might be rather noisy as they may overreport their progress. Second, it is a primary measure of compliance since teachers need to be trained to deliver the content of the workbooks in class. Average treatment on the treatment (ATT) effects can then be obtained by instrumenting Z_{jp} with the random assignment of the treatment, T_{jp} .

3.6 Treatment Intensity

In the 150 treatment schools, about 73% of the teachers received at least one training sessions and only 43% attended all the sessions. If we look at compliance as measured by teachers' self-report of their progress teaching the lessons to their students, the intensity of the treatment looks even more modest. Figure 3 shows that coverage of the lessons had a bimodal distribution in all grades. At endline, roughly a third of the HGE teachers in the treatment group reported that they had not taught a single lesson of the financial education material. Relatively fewer teachers reported to have covered part of the material and a large share of them taught all the lessons. Full coverage is particularly high in 10th and 11th grades, at 52% and 48%, respectively. Only 39% of the teachers in 9th grade were able to go through all the workbook, which may respond to a relatively longer curriculum in this grade (see Table A.1).

Figure 3: Coverage of Financial Education Content as Reported by Teachers, by Grade



Under the pilot activities, teachers received the instruction to include the financial education material in the Economics portion of the HGE class. However, they were not offered additional guidelines to replace content or accommodate their time usage for other topics in the course. Qualitative evidence indicates that teachers struggled to incorporate the ma-

terials. Survey data reveals that teachers significantly reduced the time allocated to teach history, politics, and world news to increase the time dedicated to financial education. The time destined to teach Economics was not significantly affected.

All in all, the intensity of the treatment was modest. Consequently, the results obtained in the pilot should be interpreted as a lower bound of those which could be obtained by offering more specific guidelines to incorporate the material and closer monitoring of the progress. The inclusion of financial education in the school curriculum could of course solve these implementation issues in subsequent rounds or scaling up efforts.

4 Results

4.1 Treatment Impacts on Students

In general, *Finanzas en mi Colegio* was extremely effective to improve students' financial knowledge. Table 1 reports that scores in the grade-specific financial knowledge exam went up by 0.14 SD in the pooled sample of students. Average gains are comparable to those identified in Batty et al. [2017], who implemented a “learning by doing” program among primary students in the US and a bit below those identified in Bruhn et al. [2016]. Not only are students learning more, but they are aware of their newly acquired knowledge as reflected by the estimated impact of the treatment on students' self-evaluation of financial proficiency (see Table A.4 in Appendix A).

Treatment impacts on financial knowledge and other outcomes are also reported by grade. Financial knowledge was particularly improved among eleventh graders, who experienced gains of about 0.20 SD relative to the control at baseline. I cannot reject that this effect size is different from those identified for younger cohorts but I can reject that the effect is differential across 9th and 10th grades. In a sense, each grade received a different intervention and one should be cautious with comparisons across grades. Differential impact of the treatment may respond directly to the content of the workbook, differential demand for the

Table 1: ITT Effects on Students' Financial Knowledge and Academic Outcomes

	All	9th Grade	10th Grade	11th Grade
Financial Knowledge (Exam Score)	0.143*** [0.022]	0.150*** [0.033]	0.102*** [0.031]	0.195*** [0.029]
Number of Observations	19673	6697	6567	6409
R-squared	0.221	0.294	0.274	0.227
Number of Clusters	298	298	298	298
Cumulative GPA	0.181*** [0.046]	0.199*** [0.047]	0.159*** [0.048]	0.189*** [0.052]
Number of Observations	19170	6513	6399	6258
R-squared	0.427	0.441	0.449	0.444
Number of Clusters	298	298	298	298
Grade Progression	0.001 [0.009]	0.016 [0.012]	-0.018 [0.012]	0.009 [0.010]
Number of Observations	18313	6136	6106	6071
R-squared	0.069	0.094	0.097	0.103
Number of Clusters	298	298	298	298
Student Engagement	0.006 [0.013]	0.014 [0.018]	-0.017 [0.019]	0.023 [0.020]
Number of Observations	17596	5984	5887	5725
R-squared	0.306	0.292	0.336	0.346
Number of Clusters	298	298	298	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, score in literacy exam at baseline, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, and has dinner with parents all days of the week. In the case of financial knowledge, the value of dependent variable at baseline is also included as a control.

topics delivered, different levels of difficulty in the material covered, greater levels of effort of students/teachers, among others.

A potential concern is that the provision of financial education while in school may divert time or effort away from other courses, damaging academic performance. Alternatively, the

content of the financial education program may complement well some of the material taught in certain courses, leading to improved performance in them. The innovative content may also promote students' motivation that can spillover into other courses.

Table 1 shows that the treatment fosters sizable performance improvements. In the pooled sample, the treatment leads to a 0.18 SD increase in the cumulative GPA at the end of the academic year.¹⁰ The effect is similar once the HGE course is excluded from the final GPA. The impact on Mathematics and Language is similar and around 0.15-0.16 SD in the pooled sample (see Table A.4).

The impact on GPA is surprising and common to all courses. It exceeds the usual effect sizes of educational interventions specifically targeted to improve academic performance. More surprisingly, the treatment did not increase student engagement (see last panel in Table 1).¹¹ Below, we come back to this finding and discuss other potential channels.

Despite these considerable performance gains, Table 1 reveals that *Finanzas en mi Colegio* did not yield any effect on grade progression. This could respond to the fact that passing rates are already very high: both the average and the median passing rate in the sample of schools is 0.94. Fortunately, the program did not yield unintended perverse effects on dropout as in Bjorvatn et al. [2015], where the curriculum covered encouraged entrepreneurship.

Teaching financial skills entails covering constructs such as opportunity cost, intertemporal trade-offs, and risk aversion, among others. In addition to the normative content on financial products and services or consumer rights, the program covered fundamental topics that may have impacted individual preferences or socioemotional skills. This is particularly important since we still know little about the malleability of these traits and the extent to which environment can shape them. Moreover, these are the traits we can change *today* with the goal of changing behavior *tomorrow*.

Table 2 presents the treatment impacts on conscientiousness, self control, impulsiveness,

¹⁰All grades are normalized by school quality to make them comparable across schools. See Appendix C for more details on the normalization implemented.

¹¹The scale to measure student engagement comes from the Student Engagement in Schools Questionnaire (SESQ) and measures behavioral engagement: effort and persistence [Hart et al., 2011].

Table 2: ITT Effects on Students' Socioemotional Skills and Preferences

	All	9th Grade	10th Grade	11th Grade
Consciousness	-0.014 [0.013]	-0.024 [0.019]	-0.036* [0.019]	0.015 [0.021]
Number of Observations	15848	5294	5276	5278
R-squared	0.195	0.209	0.208	0.238
Number of Clusters	298	298	298	298
Self-control	0.028** [0.014]	0.017 [0.021]	0.061*** [0.020]	0.012 [0.021]
Number of Observations	17391	5845	5846	5700
R-squared	0.202	0.186	0.226	0.266
Number of Clusters	298	298	298	298
Impulsiveness	-0.003 [0.014]	0.012 [0.023]	-0.013 [0.022]	-0.008 [0.022]
Number of Observations	13156	4215	4491	4366
R-squared	0.174	0.187	0.190	0.226
Number of Clusters	298	294	294	296
Risk aversion	0.008 [0.007]	-0.028** [0.011]	0.018* [0.011]	0.037*** [0.012]
Number of Observations	13473	4365	4591	4482
R-squared	0.076	0.089	0.113	0.118
Number of Clusters	298	298	294	296
Hyperbolic preferences	-0.001 [0.005]	0.015 [0.010]	-0.018* [0.009]	0.005 [0.009]
Number of Observations	13326	4433	4524	4321
R-squared	0.023	0.055	0.060	0.052
Number of Clusters	298	294	296	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, has dinner with parents all days of the week, and the value of dependent variable at baseline.

risk aversion, and the prevalence of hyperbolic time preferences. *Finanzas en mi Colegio* successfully fostered the development of self-control skills. The global effect was 0.03 SD and the largest effect is identified among 10th graders (0.06 SD). Tenth graders also exhibit a reduction in their consciousness scale which, together with the lack of impact in impulsiveness, reveals that the treatment was not successful at improving children's planning abilities. The intervention impacted risk preferences, making 9th graders more risk loving and 10th and 11th graders more risk averse. Finally, the treatment reduced the share of 10th graders with hyperbolic preferences by 1.6 percentage points.

Although the impact on preferences and socioemotional skills seems modest, these are important findings. The intervention was not directly designed to affect these traits but it still had an impact on them, especially on self-control. Developing lessons with more specific content to encourage the development of these traits may prove effective among the youth.

The treatment had global and significant effects on financial behavior (see first column of Table 3). In the pooled sample, the intervention leads to better shopping and saving habits and greater levels of communication with parents on financial matters. There is a significant and positive effect on the shares of students who compare prices before shopping (1.2 percentage points), save instead of borrowing before buying something they cannot afford (1.3 percentage points), and talk to their parents about household financial decisions (1.1 percentage points).

Given the heterogeneous nature of the material, it is much interesting to look at the outcomes by grade and try to correlate the curriculum taught with changes in behavior. First, the share of 9th graders who talks to their parents about household finances increases by almost 2 percentage points. This could be related to the practical lessons on budgeting covered in their curriculum, which could be easily and naturally shared with the rest of the family. Second, the share of 10th graders who saves as opposed to getting indebted to buy something they cannot afford increases by 2 percentage points. This goes in line with the strongest effects on self-control and time preferences recorded in this sample. Third, 11th

Table 3: ITT Effects on Students' Financial Behavior

	All	9th Grade	10th Grade	11th Grade
Budgeting	0.006 [0.007]	0.017 [0.011]	-0.007 [0.010]	0.005 [0.012]
Number of Observations	15852	5186	5338	5278
R-squared	0.064	0.091	0.074	0.101
Number of Clusters	298	296	296	298
Compares prices	0.012* [0.007]	0.012 [0.012]	0.002 [0.012]	0.024** [0.012]
Number of Observations	16236	5361	5450	5390
R-squared	0.045	0.064	0.074	0.068
Number of Clusters	298	298	294	298
Saves to buy	0.013*** [0.005]	0.011 [0.007]	0.020*** [0.007]	0.015** [0.007]
Number of Observations	16720	5562	5598	5522
R-squared	0.054	0.084	0.087	0.066
Number of Clusters	298	298	294	298
Bargaining	0.005 [0.007]	-0.008 [0.012]	0.007 [0.012]	0.025** [0.011]
Number of Observations	16236	5361	5450	5390
R-squared	0.054	0.073	0.090	0.073
Number of Clusters	298	298	294	298
Talks to parents about financial decisions	0.011* [0.007]	0.019* [0.011]	0.007 [0.010]	0.003 [0.011]
Number of Observations	16528	5433	5545	5486
R-squared	0.091	0.101	0.097	0.140
Number of Clusters	298	296	294	298
Financial autonomy index	0.011 [0.015]	-0.021 [0.026]	-0.012 [0.023]	0.073*** [0.026]
Number of Observations	16883	5604	5673	5568
R-squared	0.151	0.170	0.175	0.189
Number of Clusters	298	298	294	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, has dinner with parents all days of the week, and the value of dependent variable at baseline.

graders seem to become more responsible consumers, in line with the lessons they received. The probabilities of comparing prices, bargaining before shopping, and saving to buy goods that cannot be afforded all increase for the treatment group. These changes are accompanied by a strong and highly significant effect on the level of financial autonomy (0.07 SD).

Table 4: ITT Effects on Students' Pattern of Expenditures

	All	9th Grade	10th Grade	11th Grade
Entertainment	-0.006* [0.003]	-0.007 [0.005]	-0.001 [0.004]	-0.009* [0.005]
School supplies	0.001 [0.003]	0.002 [0.004]	-0.002 [0.004]	0.003 [0.005]
Clothes	-0.006 [0.004]	-0.008 [0.005]	-0.005 [0.006]	-0.003 [0.005]
Home	0.003 [0.002]	0.003 [0.004]	-0.001 [0.003]	0.006** [0.003]
Savings	0.005 [0.004]	0.007 [0.006]	0.000 [0.006]	0.009 [0.006]
Other expenditures	0.002 [0.002]	0.004 [0.003]	-0.004 [0.003]	0.006** [0.003]
Number of Observations	19664	6693	6564	6407
Number of Clusters	298	298	298	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, has dinner with parents all days of the week.

Table 4 reports the impact of the treatment on the share of expenditures destined to different categories. In general, the program reduced the proportion of expenditures destined to entertainment. The effects on budget allocation seem to be stronger among 11th graders, who substitute expenditures in more superfluous services for expenditures in household goods and other goods and services.

In sum, the intervention was extremely successful at improving financial knowledge and

academic performance. It also led to important changes in socioemotional traits and preferences. To the extent that current financial choices of the youth are mostly related to consumption habits, we argue that the treatment also had a modest impact on behavior.

While the results on financial knowledge are in line with previous findings (see Section 2), the large impact on academic performance is quite novel and surprising. As noted above, the effect is not driven by increased students' emotional engagement. Sub-section 4.2 shows that neither is there an effect through increased teachers' perceived efficacy (see Table 5), which rules out that the pedagogical training component played a role on its own.

Two alternative explanations emerge. First, it may be that the content of the financial literacy component generated synergies with the material covered in other courses. Although we cannot rule it out, this explanation is not consistent with the pattern of academic improvement across courses. The gains are similar across all subjects, despite greater expected synergies in courses such as Mathematics. An alternative explanation is that the innovative content provided boosted other dimensions of student engagement such as the affective component (liking for learning and/or liking for school). Providing content that is perceived as practical and useful after graduation may renew students' interest and promote students' affective engagement. Indeed, Busso et al. [2017] documents that the leading reason to dropout in Latin America and the Caribbean is students' lack of interest in school and school curriculum. Although we cannot test this hypothesis directly, qualitative evidence collected through focus groups is consistent with this explanation: teachers report that they noticed greater levels of student motivation due to the perceived usefulness of the content and the practical tools provided for themselves and their households.

As expected, ATT effects for financial literacy, preferences and socioemotional traits, and behavior are even larger than the ITT effects, but the general patterns and significance levels do not change dramatically.¹²

It is worth noting that there is no evidence of strong heterogeneous impacts of the program

¹²See Tables A.5-A.7 in Appendix A.

neither on financial knowledge nor on academic outcomes. First, there are no significant gender differentials in learning, neither in terms of financial literacy nor in terms of academic performance. Second, students who work do not exhibit any differential impact on their performance in the financial literacy exam or on their final GPA. However, in the oldest cohort of students, the treatment increases the passing rate of those who work by 3 percentage points. Third, ninth-graders with higher initial financial literacy reflect a significant increase of 0.04 SD in their level of class engagement.¹³

4.2 Treatment Impacts on Teachers

The training teachers received was quite intensive, down to earth, and followed a cumulative logic that build upon broader economic concepts to then move onto more specialized material. Teachers were trained on the content covered in all grades, irrespective of the grade they were currently teaching, during a 20-hour long workshop imparted throughout 5 days. Moreover, the workbook and the curriculum were designed with high school students as the target beneficiaries in mind. Consequently, the materials used a very direct and simple language, with concrete examples and case studies that appealed to every day life. Teachers were also exposed to a great degree of repetition of the content of the program since they had to teach this to their students. Thus, the impact on teachers' outcomes can be used as a correlate of the impact of an intensive financial education program with high exposure to the content through repetition, accessible materials, and a more general curriculum.

On average, the treatment generates important knowledge gains of about 0.32 SD among HGE teachers (see Table 5). These gains are internalized as shown by the 0.35 SD increase in teachers' self-assessment of their level of financial literacy.

HGE teachers do not exhibit any improvements in their perceived levels of teaching efficacy. This suggests that the pedagogical component did not have spillover effects on their teaching practices in other courses. This is not surprising given that the last day focused

¹³Results not shown but available upon request.

Table 5: ITT Effects on Teachers' Financial Knowledge, Teaching Efficacy, Preferences, and Socioemotional Skills

Financial Knowledge & Efficacy		Socioemotional & Preferences	
Financial Knowledge (Exam Score)	0.320*** [0.100]	Consciousness	0.105 [0.110]
Number of Observations	417	Number of Observations	240
R-squared	0.367	R-squared	0.392
Number of Clusters	250	Number of Clusters	164
Self-Assessment Financial Knowledge	0.352*** [0.089]	Self-control	0.066 [0.089]
Number of Observations	352	Number of Observations	255
R-squared	0.465	R-squared	0.385
Number of Clusters	224	Number of Clusters	170
Teaching Efficacy	0.010 [0.087]	Impulsiveness	0.136* [0.078]
Number of Observations	318	Number of Observations	290
R-squared	0.425	R-squared	0.330
Number of Clusters	206	Number of Clusters	184
		Risk aversion	0.070* [0.036]
		Number of Observations	332
		R-squared	0.464
		Number of Clusters	212
		Hyperbolic preferences	0.030 [0.036]
		Number of Observations	311
		R-squared	0.354
		Number of Clusters	198

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, type of contract, total hours teaching, experience, degree in social sciences, and postgraduate studies.

mostly on sharing with the teachers the background of the pilot and the importance of financial education at the national level and in the public school curriculum. Teachers do not

react in terms of their intertemporal preferences, self-control levels of consciousness, which is expected as these traits are less malleable during adulthood. However, the treatment seems to increase the impulsiveness level of teachers and the share of them who are risk averse.

Table 6 shows that teachers' do not change their shopping habits. However, the treatment generates important effects on saving habits. Teachers in the treatment group are 9 percentage points more likely to save. Behind this aggregate effect, there is a 14 percentage point increase in the share of those who save through formal channels, almost twice as large as the impact identified on the share of informal savers.

A crucial difference between a teacher and any other adult receiving financial education is that the former has to teach the content to her students over and over again. The exercise of simplifying the concepts and repeating them to their students in different ways may be an important channel that explains the gap in learning when compared to the available evidence on the impact of financial literacy programs among adults. By relying on the measure of compliance that captures the coverage of the lessons in class, I explore the heterogeneous impact on teachers' outcomes by the degree of repetition of the content. Based on the self-reported data on coverage of lessons, I define three groups of teachers: no repetition (i.e., they never taught a lesson), low repetition (i.e., they taught less than half of the lessons), and high repetition (i.e., they taught most of the lessons).

Indeed, the greater the exposure to repetition of the content, the larger are the financial literacy improvements among teachers. Table A.8 shows that those who covered more than half of the sessions in class reap off gains close to 0.50 SD. These teachers in the high repetition group also report greater perceived teaching efficacy (0.28 SD). Along the same lines, the impact on savings is only significant for the high repetition group as shown in Table A.9. The effect of the treatment on formal savings also seems to be increasing in exposure to repetition. The probability of saving in the formal sector among teachers in the treatment group who covered most of the lessons goes up by more than 20 percentage points.

This exercise is only informative as the number of sessions taught is not exogenous and

Table 6: ITT Effects on Teachers' Consumption and Savings Habits

Consumption Habits		Savings Habits	
Budgeting	-0.013 [0.025]	Saves	0.087** [0.035]
Number of Observations	331	Number of Observations	334
R-squared	0.426	R-squared	0.410
Number of Clusters	212	Number of Clusters	214
Compares prices	0.081 [0.051]	Saves formally	0.140*** [0.048]
Number of Observations	315	Number of Observations	376
R-squared	0.439	R-squared	0.313
Number of Clusters	204	Number of Clusters	232
Saves to buy	0.053 [0.050]	Saves informally	0.080* [0.042]
Number of Observations	290	Number of Observations	334
R-squared	0.383	R-squared	0.422
Number of Clusters	190	Number of Clusters	214
Bargains	-0.064 [0.052]		
Number of Observations	315		
R-squared	0.432		
Number of Clusters	204		
Financial Autonomy Index	0.130 [0.095]		
Number of Observations	347		
R-squared	0.330		
Number of Clusters	214		

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, type of contract, total hours teaching, experience, degree in social sciences, and postgraduate studies.

instead may depend on the motivation of the teachers and their initial level of financial knowledge, among other observable and unobservable characteristics. However, when checking how ex-ante observables vary across different repetition levels, no important differences emerge (see Table A.10). Although I cannot rule out that selection into these three groups is guided by unobservables or initial levels of financial literacy, the similarity in observables is somehow reassuring.

In sum, this evidence suggests that repetition by teaching new concepts to someone else seems to enlarge the effects of the treatment among teachers. Again, this analysis is only suggestive due to the endogeneity of the intensity of the repetition but it may suggest why one shot programs, usually preferred to maximize attendance among adults, are not successful at improving financial literacy and behavior among adults. Helping adults learn and change their habits may entail the use of strategies that reinforce the concepts repeatedly.

4.3 Cost Analysis

Existing evidence on financial literacy interventions does not provide any information on the costs of implementation. These data are extremely important, especially since these programs have become a common tool in financial inclusion efforts supported by national governments. Moreover, as an increasing number of countries are running school-based pilots with the hopes of scaling up these interventions, it becomes even more urgent to collect and share information on their cost-effectiveness.

On average, implementing *Finanzas en mi Colegio* in 150 schools (31,000 students) cost US\$ 6.6 per student. The cost-effectiveness ratio in terms of the impact on student financial knowledge is 0.021, which is very high when compared to cost-effective interventions that seek to improve academic performance in general. For each additional dollar spent per student, the yield is about 2.2 additional points in the 2015 PISA financial literacy assessment. In other words, the impact of the intervention is equivalent to a 14.8-point improvement, a gain that would half the gap relative to the next country in the ranking.

5 Conclusion

In the last decade, numerous countries have given financial education a central role in their efforts to promote financial inclusion. Until recently, financial education was conceived as corrective or compensatory and aimed at an adult population at risk of making inadequate financial decisions. Available evidence to date, which comes largely from interventions focused on adults, indicates that financial education programs have had very limited effects on financial behavior.

In this sense, the development of financial education programs aimed at children and adolescents offers great potential. On the one hand, the provision of financial education within the school offers the possibility of reaching a captive audience, which solves the problems of participation and attendance faced when working with adults. On the other hand, children and young people are more malleable in terms of their habits because they are still developing them; providing timely guidance could be crucial to have a significant and lasting impact on their financial behavior during adulthood.

However, when working with this age group, we are mostly trying to change future behavior today. Even if we are able to promote healthier financial habits today, the spectrum of choices young adults face is still quite limited. Thus, changes in behavior today may not permeate into more complex decisions they will face once in the labor market. The key challenge is then going beyond being able to change present habits and at the same time alter intrinsic preferences and socioemotional skills that will shape financial choices and habits during adulthood.

This study contributes to the scarce literature devoted to the study of the effect of financial education on young people. Overall, *Finanzas en mi Colegio* was extremely effective in improving students' and teachers' financial knowledge. The average gains among students are equivalent to an improvement of 14.8 points in Peru's performance in the 2015 PISA financial literacy assessment which implies halving the gap in performance with the next country in the ranking, Chile. Importantly, the effects on financial literacy are not generated

in detriment of performance in other courses. On the contrary, the treatment increases students' overall performance.

The treatment had heterogenous impacts on socioemotional skills and preferences as well as on the behavior of the students. This was expected since the content of the workbooks differed by grade. Nevertheless, we identify a significant and global improvement in self-control skills and consumption habits as well as a general reduction of the share of expenditures destined to superfluous consumption goods.

Among teachers, the treatment generates increases of the order of 0.32 SD in their financial literacy test score. The effects on their socioemotional characteristics or preferences are limited, which is not surprising given the evidence of less malleability of these attributes during adulthood. Nevertheless, the treatment led to important increases in the share of savers, particularly those who save formally. Although this result is not exactly comparable with existing evidence for adults, it is still encouraging as it shows that some adults may learn but under more intensive programs, with more accessible materials, and that cover a broad curriculum. The heterogeneous impact on teachers by repetition level suggests that adults may need learning strategies that incorporate constant reinforcement to successfully improve financial literacy and behavior.

The intervention was cost-effective. With a cost per student of US\$ 6.6, at a scale of 150 schools (31,000 students), the cost-effectiveness ratio was 0.021. Every dollar spent per student is equivalent to a 2.2 point improvement in the PISA 2015 financial literacy test.

Keeping in mind that a third of the teachers never taught a single lesson and that only 43% of them attended all training sessions, the results obtained are quite promising. The intention to treat effects are impressive even with modest levels of treatment intensity. Including the financial education content in the secondary school curriculum could have greater effects since teachers' attendance to the training workshops could be better enforced. It would also solve the coordination problems between teachers and principals to incorporate the materials and help teachers plan ahead to reserve time for this particular content.

References

- Ashraf, N., Karlan, D. and Yin, W. [2006], ‘Tying odysseus to the mast: Evidence from a commitment savings product in the philippines’, *The Quarterly Journal of Economics* **121**(2), 635–672.
- Batty, M., Collins, M. and Odders-White, E. [2015], ‘Experimental evidence on the effects of financial education on elementary school students’ knowledge, behavior, and attitudes’, *The Journal of Consumer Affairs* **49**(1), 69–96.
- Batty, M., Collins, M., O’Rourke, C. and Elizabeth, O. [2017], Experiential Financial Literacy: A Field Study of My Classroom Economy. Working paper.
- Becchetti, L. and Pisani, F. [2012], Financial Education on Secondary School Students: The Randomized Experiment Revisited. Facolta di Economia di Forli, Working Paper No. 98.
- Berry, J., Karlan, D. and Pradhan, M. [2015], The Impact of Financial Education for Youth in Ghana. NBER Working Paper No. 21068.
- Bjorvatn, K., Cappelen, A., Helgesson Sekei, L., Sørensen, E. and Tungodden, B. [2015], Teaching through Television: Experimental evidence on entrepreneurship education in Tanzania. Norwegian School of Economics (NHH) Choice Lab Working Paper.
- Bover, O., Hospido, L. and Villanueva, E. [2018], The Impact of High School Financial Education on Financial Knowledge and Choices: Evidence from a Randomized Trial in Spain, Technical report, Documento de Trabajo N. 1801, Banco de España.

- Bruhn, M., de Souza Leão, L., Legovini, A., Marchetti, R. and Zia, B. [2016], ‘The Impact of High School Financial Education: Evidence from a Large-Scale Evaluation in Brazil’, *American Economic Journal: Applied Economics* **8**(4), 256–295.
- Bruhn, M. and McKenzie, D. [2009], ‘In pursuit of balance: Randomization in practice in development field experiments’, *American Economic Journal: Applied Economics* **1**(4), 200–232.
- Busso, M., Cristia, J., Hincapie, D., Messina, J. and Ripani, L. [2017], Learning Better: Public Policy for Skills Development, Technical report, Inter-American Development Bank.
- Comision Multisectorial de Inclusion Financiera [2015], Estrategia Nacional de Inclusion Financiera, Peru.
URL: <https://www.mef.gob.pe/contenidos/archivos-descarga/ENIF.pdf>
- Eissa, N., Habyarimana, J. and William, J. [2014], Chapter 5: Can cartoons improve the effectiveness of financial education?, in M. Lundberg and F. Mulaj, eds, ‘Enhancing Financial Capability and Behavior’, The World Bank.
- Fernades, D., Lynch, J. and Netemeyer, R. [2014], ‘Financial literacy, financial education, and downstream financial behaviors’, *Management Science* **60**(8), 1861–1883.
- Frisancho, V., Krishna, K., Lychagin, S. and Yavas, C. [2016], ‘Better luck next time: Learning through retaking’, *Journal of Economic Behavior & Organization* **125**, 120–135.
- Furtado, I., Legovini, A. and Piza, C. [2017], How Early One Should Start Financial Education: Evidence from a Large Scale Experiment. World Bank, DIME Financial and PSD Program in Brief.

- Gathergood, J. [2012], ‘Self-control, financial literacy and consumer over-indebtedness’, *Journal of Economic Psychology* **33**, 590–602.
- Hart, S., Stewart, K. and Jimerson, S. [2011], ‘The student engagement in schools questionnaire (sesq) and the teacher engagement report form-new (terf-n): Examining the preliminary evidence’, *Contemporary School Psychology* **15**, 67–79.
- Henrichs, J. and Van den Bergh, B. [2015], Perinatal developmental origins of self-regulation, *in* G. Gendolla, M. Tops and S. Koole, eds, ‘Handbook of Biobehavioral Approaches to Self-Regulation’, Springer.
- Jamison, J., Karlan, D. and Zinman, J. [2014], Financial Education and Access to Savings Accounts: Complements or Substitutes? Evidence from Ugandan Youth Clubs. NBER Working Paper No. 20135.
- Lührmann, M., Serra-Garcia, M. and Winter, J. [2015], The Impact of Financial Education on Adolescents’ Intertemporal Choices. Institute for Fiscal Studies, Working Paper W14/18.
- Mandell, L. [2009], The Financial Literacy of Young American Adults: Results of the 2008 National Jump\$tart Coalition Survey of High School Seniors and College Students., Technical report, Jump\$tart Coalition.
- Mandell, L. and Klein, L. [2009], ‘The impact of financial literacy education on subsequent financial behavior’, *Journal of Financial Counseling and Planning* **20**(1), 15–24.
- McEwan, P. [2015], ‘Improving learning in primary schools of developing countries: A meta-analysis of randomized experiments’, *Review of Educational Research* **85**(3), 353–394.

- Miller, M., Reichelstein, J., Salas, C. and Zia, B. [2014], Can You Help Someone Become Financially Capable? A Meta-Analysis of the Literature. World Bank, Policy Research Working Paper 6745.
- OECD/INFE [2015], National Strategies for Financial Education, Technical report, Policy Handbook.
- Orozco-Cabal, L., Rodríguez, M., Herin, D., Gempeler, J. and Uribe, M. [2010], ‘Validity and reliability of the abbreviated barratt impulsiveness scale in spanish (bis-15s)’, *Revista Colombiana de Psiquiatría* **39**(1), 93–109.
- Pervin, L. A. and John, P. [1999], The big-five trait taxonomy: History, measurement, and theoretical perspectives, in O. P. John and S. Srivastava, eds, ‘Handbook of personality: Theory and research’, New York: Guilford Press.
- Ringquist, E. [2013], *Meta-Analysis for Public Management and Policy*, Wiley.
- Strömbäck, C., Lind, T., Skagerlund, K., Västfjäll, D. and Tinghög, G. [2018], ‘Does self-control predict financial behavior and financial well-being?’, *Journal of Behavioral and Experimental Finance* **14**, 30–38.
- Tangney, J., Baumeister, R. and Boone, A. [2004], ‘High self-control predicts good adjustment, less pathology, better grades, and interpersonal success’, *Journal of Personality* pp. 271–324.

A Additional Figures and Tables

Table A.1: Financial Literacy Lessons in Student Workbooks by Grade

3rd grade	4th grade	5th grade
1. Needs and resources 1.1. Wants vs. needs 1.2. Opportunity cost 1.3. Savings vs. credit, expenditure vs. investment 1.4. Economic agents	1. Financial products and services 1.1. Financial system 1.2. Saving vs. Investment 1.3. Assets and liabilities 1.4. Financial future and capacity to pay 1.5. Adequate usage of financial products and services	1. Responsible financial consumer 1.1. Capacity to pay 1.2. Overindebtedness 1.3. Financial consumer's rights 1.4. Protection of consumer rights 1.5. The State and financial stability
2. Budgeting 2.1. Financial plan 2.2. Income and expenses 2.3. Budgeting 2.4. Usefulness of budgets		2. Information 2.1. Transparency in financial contracts 2.2. Consumers' responsibilities

Table A.2: Balance check: School characteristics

Variable	Control mean	T-C	N
Number of teachers	22.347 [12.497]	0.213 [1.415]	300
Number of students	362.973 [222.866]	-3.107 [25.412]	300
Number of classrooms	13.887 [7.516]	-0.073 [0.841]	300
Number of students, 9th grade	72.060 [42.631]	0.747 [4.952]	300
Number of students, 10th grade	68.880 [41.459]	-0.500 [4.767]	300
Number of students, 11th grade	64.933 [42.250]	-0.207 [4.692]	300
Number of classrooms, 9th grade	2.773 [1.542]	0.020 [0.171]	300
Number of classrooms, 10th grade	2.660 [1.423]	-0.007 [0.164]	300
Number of classrooms, 11th grade	2.553 [1.412]	-0.020 [0.161]	300
Passing rate	0.934 [0.046]	0.004 [0.005]	300
Dropout rate	0.062 [0.047]	-0.005 [0.005]	300
Water services	0.779 [0.416]	-0.007 [0.049]	294
Electricity connection	0.986 [0.117]	0.000 [0.014]	290
Drainage services	0.747 [0.436]	0.022 [0.050]	293
Number of desks in good condition	65.720 [125.337]	4.153 [15.574]	300
Presence of a principal	0.780 [0.416]	0.047 [0.046]	300

Note: Significance levels (* 10%; ** 5%; *** 1%). Differences between control and treatment group are obtained from regressing each variable on the treatment dummy. Standard errors in brackets.

Table A.3: Balance check: Student characteristics

Variable	Control mean	T-C	N
Sex	1.504 [0.500]	-0.009 [0.017]	20961
Age	15.178 [1.220]	-0.003 [0.034]	18600
Ratio of household members to bedrooms	1.852 [0.992]	0.008 [0.024]	20140
Mother's education: Primary or less	0.429 [0.495]	0.006 [0.027]	19508
Mother's education: Secondary	0.419 [0.493]	0.008 [0.017]	19508
Mother's education: More than secondary	0.152 [0.359]	-0.014 [0.016]	19508
Father's education: Primary or less	0.429 [0.495]	0.006 [0.027]	19508
Father's education: Secondary	0.419 [0.493]	0.008 [0.017]	19508
Father's education: More than secondary	0.152 [0.359]	-0.014 [0.016]	19508
Lives with both parents	0.590 [0.492]	-0.000 [0.016]	20384
Asset index	0.000 [1.000]	-0.008 [0.083]	20475
High level of parental supervision	0.755 [0.430]	0.005 [0.010]	19456
Has dinner with parents 7 days a week	0.321 [0.467]	-0.001 [0.011]	20582
Truancy in the past 2 weeks	0.058 [0.234]	-0.005 [0.005]	20600
Student engagement (scale)	0.000 [0.884]	0.005 [0.029]	18460
Expects to become a professional	0.804 [0.397]	-0.010 [0.012]	19373
Expects to obtain at least tertiary education	0.509 [0.500]	-0.005 [0.019]	20261
Impulsiveness	-0.000 [0.879]	0.016 [0.022]	17546
Conscientiousness	-0.000 [0.884]	0.005 [0.024]	15807
Self-control	-0.000 [0.887]	-0.004 [0.023]	16984
Time preferences: Patient	0.610 [0.488]	0.005 [0.010]	16529
Time preferences: Somewhat impatient	0.121 [0.326]	0.005 [0.006]	16529
Time preferences: Impatient	0.269 [0.443]	-0.010 [0.010]	16529
Time inconsistency: hyperbolic	0.110 [0.313]	-0.006 [0.005]	20983
Time inconsistency: patient now	0.260 [0.438]	0.005 [0.011]	20983

Continued on next page

Variable	Control mean	T-C	N
Time inconsistency: impatient later	0.074 [0.261]	-0.004 [0.004]	20983
Risk lover	0.077 [0.267]	0.000 [0.005]	19280
Risk averse	0.708 [0.455]	0.007 [0.010]	19280
No previous exposure to financial education	0.368 [0.482]	-0.015 [0.013]	19282
Financial literacy raw score	8.058 [2.946]	0.120 [0.128]	20769
Financial literacy standardized score	-0.000 [1.000]	0.042 [0.045]	20702
Lusardi financial literacy evaluation (0-2)	0.764 [0.643]	-0.003 [0.017]	20983
Lusardi financial literacy evaluation (standardized)	-0.000 [1.000]	-0.003 [0.026]	20851
Financial autonomy (0-100)	38.271 [15.977]	0.292 [0.561]	20983
Financial autonomy (standardized)	0.000 [1.000]	0.024 [0.035]	20851
Total in earnings in past month (USD)	113.849 [344.953]	6.216 [8.271]	20983
Total expenditures in the past month	417.816 [865.320]	35.478 [24.958]	16791
Has a savings account	0.137 [0.343]	0.004 [0.008]	19317
Has a formal savings account	0.093 [0.291]	-0.002 [0.005]	19317
Prepares a personal budget	0.565 [0.496]	-0.012 [0.010]	18465
Helps family with budget	0.679 [0.467]	0.005 [0.013]	18692

Note: Significance levels (* 10%; ** 5%; *** 1%). Differences between control and treatment group are obtained from regressing each variable on the treatment dummy. Standard errors in brackets.

Table A.4: ITT Effects on Self-Assessment of Financial Knowledge and Grades

	All	3rd Grade	4th Grade	5th Grade
Self-Assessment Financial Knowledge	0.111*** [0.015]	0.067*** [0.021]	0.126*** [0.023]	0.136*** [0.023]
Number of Observations	17571	5874	5930	5767
R-squared	0.085	0.091	0.124	0.127
Number of Clusters	298	298	298	298
Cumulative GPA, Excluding HGE	0.181*** [0.046]	0.196*** [0.046]	0.158*** [0.049]	0.197*** [0.052]
Number of Observations	19170	6513	6399	6258
R-squared	0.425	0.444	0.447	0.440
Number of Clusters	298	298	298	298
Cumulative GPA in HGE	0.154*** [0.041]	0.198*** [0.051]	0.150*** [0.045]	0.111** [0.050]
Number of Observations	19170	6513	6399	6258
R-squared	0.340	0.356	0.390	0.402
Number of Clusters	298	298	298	298
Cumulative GPA in Math	0.149*** [0.037]	0.171*** [0.044]	0.092** [0.044]	0.195*** [0.042]
Number of Observations	19170	6513	6399	6258
R-squared	0.279	0.318	0.312	0.300
Number of Clusters	298	298	298	298
Cumulative GPA in Language	0.156*** [0.039]	0.167*** [0.044]	0.163*** [0.049]	0.148*** [0.048]
Number of Observations	19170	6513	6399	6258
R-squared	0.340	0.384	0.376	0.373
Number of Clusters	298	298	298	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, score in literacy exam at baseline, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, and has dinner with parents all days of the week. In the case of self-assessment of financial knowledge, the value of dependent variable at baseline is also included as a control.

Table A.5: ATT Effects on Students' Financial Knowledge and Academic Outcomes

	All	9th Grade	10th Grade	11th Grade
Financial Knowledge (Exam Score)	0.196*** [0.031]	0.206*** [0.046]	0.139*** [0.042]	0.265*** [0.040]
Number of Observations	19673	6697	6567	6409
R-squared	0.218	0.291	0.272	0.224
Number of Clusters	298	298	298	298
Cumulative GPA	0.247*** [0.063]	0.274*** [0.064]	0.217*** [0.066]	0.257*** [0.071]
Number of Observations	19170	6513	6399	6258
R-squared	0.423	0.438	0.446	0.439
Number of Clusters	298	298	298	298
Grade Progression	0.002 [0.012]	0.021 [0.017]	-0.024 [0.016]	0.013 [0.014]
Number of Observations	18313	6136	6106	6071
R-squared	0.069	0.094	0.098	0.102
Number of Clusters	298	298	298	298
Student Engagement	0.008 [0.017]	0.019 [0.024]	-0.023 [0.026]	0.031 [0.026]
Number of Observations	17596	5984	5887	5725
R-squared	0.306	0.292	0.336	0.347
Number of Clusters	298	298	298	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. Two stage least squares estimates, standard errors clustered at the school level are reported in brackets. Exposure to the treatment is defined at the school level and is equal to one when at least one teacher attended one or more training sessions and zero otherwise. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, score in literacy exam at baseline, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, and has dinner with parents all days of the week. In the case of financial knowledge, the value of dependent variable at baseline is also included as a control.

Table A.6: ATT Effects on Students' Socioemotional Skills and Preferences

	All	9th Grade	10th Grade	11th Grade
Consciousness	-0.020 [0.018]	-0.033 [0.027]	-0.049** [0.025]	0.020 [0.028]
Number of Observations	15848	5294	5276	5278
R-squared	0.195	0.209	0.208	0.238
Number of Clusters	298	298	298	298
Self-control	0.039** [0.019]	0.024 [0.028]	0.083*** [0.028]	0.017 [0.028]
Number of Observations	17391	5845	5846	5700
R-squared	0.202	0.187	0.224	0.266
Number of Clusters	298	298	298	298
Impulsiveness	-0.004 [0.019]	0.016 [0.031]	-0.018 [0.029]	-0.012 [0.030]
Number of Observations	13156	4215	4491	4366
R-squared	0.174	0.187	0.190	0.226
Number of Clusters	298	294	294	296
Risk aversion	0.012 [0.009]	-0.038*** [0.015]	0.024* [0.014]	0.051*** [0.016]
Number of Observations	13473	4365	4591	4482
R-squared	0.076	0.088	0.112	0.117
Number of Clusters	298	298	294	296
Hyperbolic preferences	-0.001 [0.007]	0.021 [0.013]	-0.024* [0.012]	0.006 [0.012]
Number of Observations	13326	4433	4524	4321
R-squared	0.023	0.054	0.059	0.051
Number of Clusters	298	294	296	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. Two stage least squares estimates, standard errors clustered at the school level are reported in brackets. Exposure to the treatment is defined at the school level and is equal to one when at least one teacher attended one or more training sessions and zero otherwise. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, has dinner with parents all days of the week, and the value of dependent variable at baseline.

Table A.7: ATT Effects on Students' Financial Behavior

	All	9th Grade	10th Grade	11th Grade
Budgeting	0.008 [0.010]	0.024 [0.015]	-0.010 [0.014]	0.006 [0.015]
Number of Observations	15852	5186	5338	5278
R-squared	0.064	0.091	0.074	0.101
Number of Clusters	298	296	296	298
Compares prices	0.016* [0.009]	0.016 [0.016]	0.003 [0.017]	0.032** [0.015]
Number of Observations	16236	5361	5450	5390
R-squared	0.045	0.064	0.074	0.068
Number of Clusters	298	298	294	298
Saves to buy	0.018*** [0.006]	0.015 [0.009]	0.027*** [0.009]	0.020** [0.009]
Number of Observations	16720	5562	5598	5522
R-squared	0.054	0.084	0.086	0.066
Number of Clusters	298	298	294	298
Bargaining	0.007 [0.009]	-0.011 [0.016]	0.009 [0.016]	0.034** [0.015]
Number of Observations	16236	5361	5450	5390
R-squared	0.054	0.073	0.090	0.072
Number of Clusters	298	298	294	298
Talks to parents about financial decisions	0.016* [0.009]	0.026* [0.015]	0.010 [0.013]	0.004 [0.014]
Number of Observations	16528	5433	5545	5486
R-squared	0.091	0.101	0.097	0.140
Number of Clusters	298	296	294	298
Financial autonomy index	0.016 [0.021]	-0.029 [0.035]	-0.017 [0.032]	0.100*** [0.035]
Number of Observations	16883	5604	5673	5568
R-squared	0.151	0.171	0.175	0.189
Number of Clusters	298	298	294	298

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. Two stage least squares estimates, standard errors clustered at the school level are reported in brackets. Exposure to the treatment is defined at the school level and is equal to one when at least one teacher attended one or more training sessions and zero otherwise. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, currently working, received financial education lessons in the past, ratio of household members to bedrooms, asset index, high level of parental supervision, lives with both parents, has dinner with parents all days of the week, and the value of dependent variable at baseline.

Table A.8: ITT Effects on Teachers' Financial Knowledge, Teaching Efficacy, Preferences, and Socioemotional Skills by Level of Repetition

	Financial Knowledge & Efficacy			Socioemotional & Preferences			
	No repetition	Low repetition	High repetition	No repetition	Low repetition	High repetition	
Financial Knowledge (Exam Score)	0.091 [0.153]	0.383** [0.159]	0.468*** [0.144]	Consciousness	0.391** [0.172]	-0.221 [0.173]	0.387* [0.218]
Number of Observations		417		Number of Observations		240	
R-squared		0.373		R-squared		0.429	
Number of Clusters		250		Number of Clusters		164	
Self-Assessment Financial Knowledge	0.139 [0.170]	0.301** [0.133]	0.593*** [0.144]	Self-control	0.214 [0.194]	0.078 [0.132]	-0.113 [0.217]
Number of Observations		352		Number of Observations		255	
R-squared		0.474		R-squared		0.390	
Number of Clusters		224		Number of Clusters		170	
Teaching Efficacy	-0.004 [0.183]	-0.176 [0.140]	0.277* [0.153]	Impulsiveness	0.196 [0.169]	0.078 [0.133]	0.159 [0.128]
Number of Observations		318		Number of Observations		290	
R-squared		0.439		R-squared		0.331	
Number of Clusters		206		Number of Clusters		184	
				Risk aversion	0.107 [0.067]	0.064 [0.058]	0.048 [0.065]
				Number of Observations		332	
				R-squared		0.465	
				Number of Clusters		212	
				Hyperbolic preferences	0.027 [0.080]	0.025 [0.056]	0.040 [0.064]
				Number of Observations		311	
				R-squared		0.354	
				Number of Clusters		198	

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. Two stage least squares estimates, standard errors clustered at the school level are reported in brackets. Exposure to the treatment is defined at the school level and is equal to one when at least one teacher attended one or more training sessions and zero otherwise. Coefficients and standard errors reported correspond to the interaction between the treatment dummy and level of repetition. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, type of contract, total hours teaching, experience, degree in social sciences, and postgraduate studies.

Table A.9: ITT Effects on Teachers' Financial Knowledge, Teaching Efficacy, Preferences, and Socioemotional Skills by Level of Repetition

	Consumption Habits				Savings Habits		
	No repetition	Low repetition	High repetition		No repetition	Low repetition	High repetition
Budgeting	-0.003 [0.057]	-0.045 [0.037]	0.021 [0.036]	Saves	0.091 [0.068]	0.063 [0.053]	0.112** [0.052]
Number of Observations		331		Number of Observations		334	
R-squared		0.430		R-squared		0.411	
Number of Clusters		212		Number of Clusters		214	
Compares prices	0.133 [0.092]	0.019 [0.078]	0.123 [0.085]	Saves formally	0.053 [0.102]	0.143** [0.072]	0.213*** [0.067]
Number of Observations		315		Number of Observations		376	
R-squared		0.443		R-squared		0.318	
Number of Clusters		204		Number of Clusters		232	
Saves to buy	0.112 [0.123]	0.081 [0.071]	-0.019 [0.069]	Saves informally	0.129 [0.084]	0.027 [0.063]	0.105* [0.058]
Number of Observations		290		Number of Observations		334	
R-squared		0.388		R-squared		0.426	
Number of Clusters		190		Number of Clusters		214	
Bargains	-0.248*** [0.092]	0.030 [0.074]	-0.053 [0.093]				
Number of Observations		315					
R-squared		0.446					
Number of Clusters		204					
Financial Autonomy Index	0.072 [0.184]	0.028 [0.143]	0.295* [0.158]				
Number of Observations		347					
R-squared		0.335					
Number of Clusters		214					

NOTE: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the school level. OLS estimates, standard errors clustered at the school level are reported in brackets. Coefficients and standard errors reported correspond to the interaction between the treatment dummy and level of repetition. All specifications include a set of dummy variables that correspond to the matched-pair of schools and the following set of controls: gender, type of contract, total hours teaching, experience, degree in social sciences, and postgraduate studies.

Table A.10: Differences in Observables Across Teachers that Incur in Heterogenous Degrees of Repetition

Variable	No exposure	Low exposure	High exposure	N
Sex	0.481 [0.503]	0.039 [0.076]	-0.022 [0.088]	240
Staff contract	0.622 [0.488]	0.108 [0.067]	-0.038 [0.086]	234
Teaching burden (more than 25h)	0.723 [0.451]	0.086 [0.067]	-0.015 [0.086]	202
High experience (greater than median)	0.471 [0.503]	0.132 [0.078]*	-0.082 [0.093]	215
Degree in social sciences	0.632 [0.486]	0.068 [0.073]	0.047 [0.085]	211
Postgraduate studies	0.425 [0.498]	-0.027 [0.081]	-0.120 [0.085]	230

Note: Significance levels (* 10%; ** 5%; *** 1%). Differences between low and high repetition are obtained relative to the no repetition category and are obtained from regressing each variable on the two former repetition categories. Standard errors in brackets.

B Financial Literacy Exams

B.1 Students

NINTH GRADE

1. Rebecca has saved S/ 10,000 in a moneybox at home. Her plan is to enroll in an English course next year and she needs all of the money she saved. Which is the safest place for her money?
 - (a) A closet in her bedroom
 - (b) A bank savings account
 - (c) In the house of a close friend
 - (d) Buying jewelry that she can sell later
2. Under which of the following circumstances would it be financially beneficial to you to borrow money to buy something now and repay it with future income?
 - (a) When you want to give tickets to your parents to travel to Europe
 - (b) When you want to purchase a videogame
 - (c) When you want to buy a motorcycle that would help you to get a job delivering pizza
 - (d) When you want to buy fashion clothes
3. David just found a job with a take-home pay of S/ 2,000 per month. He must pay S/ 1000 for rent and S/ 150 for groceries each month. He also spends S/ 250 per month on transportation and S/ 300 in movie outings and restaurants. How many months will it take him to accumulate savings of S/ 600.
 - (a) 1 month
 - (b) 2 months
 - (c) 3 months
 - (d) 4 months
4. Jose and Manolo work together in the finance department of the same company and earn the same pay. Manolo spends his free time taking work-related classes to improve his computer skills; while Jose spends his free time socializing with friends and working out at a fitness center. After five years, what is likely to be true?
 - (a) Jose will make more because he is more social
 - (b) Jose will make more because Manolo is likely to be laid off
 - (c) Manolo will make more money because he is more valuable to his company
 - (d) Jose and Manolo will continue to make the same money
5. The parents of Rachel told her to get groceries for the week at the supermarket. They gave her a shopping list and S/ 300. At the supermarket, she realized that the total amount she had to pay was S/ 315. Which of the following is the best solution to the problem that Rachel is facing?
 - (a) Give back everything and go back home without any groceries
 - (b) Ask for a discount
 - (c) Leave the chocolate ice cream that was included in the shopping list
 - (d) Borrow S/ 15 from a stranger in the line

6. Ana is mother of two children who attend to primary school; one is 6 and the other 9 years old. Ana is the only one who takes care of the children and has some issues managing her budget. Her friend suggested her to classify her needs by primary and secondary in order to take better financial decisions. Which of these is a secondary need at Ana's home?
- Buy groceries for the month
 - Pay the rent
 - Buy a TV
 - Buy school supplies and uniforms
7. Julio is a house painter. He has been asked to paint a house the next Monday at 8am, but he was planning to help his brother painting his house at the same time the same day. Julio decides to refuse the offer and help his brother. What is the opportunity cost of helping his brother?
- The amount he would have earned if he have accepted the offer
 - A little bit more than the amount he would have earned for painting the house
 - A little bit less than the amount he would have earned for painting the house
 - Julio does not have an opportunity cost for helping his brother
8. In town Q, quinoa is produced but there are no roads that connect this town with the capital of the region, which impedes the transport of the product. Besides affecting the firms that produce quinoa, this problem handicaps the families of Q because the growth of this economic activity creates more and better employment. In your opinion, who is responsible of building a new road that connects town Q to the capital of the region?
- The State because it is responsible of facilitating the infrastructure that is needed to foster economic activities
 - Quinoa firms because they are responsible of assuming the cost of the means that would benefit them directly
 - The inhabitants of town Q because fostering the economic activity triggers the town development
 - The banks of Q. Otherwise, the firms would not be able to pay the loans they have with the banks
9. Which of the following is **NOT** a role that families play in the economy?
- Establish regulatory measures to economic activities
 - Consumption of goods and services offered in the market
 - Be employed by the firms that produce goods and services
 - Require a minimum quality of the goods and services they consume
10. Angelica receives a take-home pay of S/. 1,500 monthly. She has decided to save S/. 100 monthly. Based on this scheme, what should she look for in her monthly plan?
- Her monthly expenditures should not be higher than S/. 1,400
 - Her monthly expenditures should not be higher than S/. 1,500
 - Look for an increase of S/ 100 in her income
 - Her savings should not be higher than S/. 1,500 ?
11. Which of the following is an example of saving?
- Raul is going to buy a car in two years from now. To achieve this, he saves a fraction of his monthly income

- (b) Raul is going to buy a car in six months from now. To achieve this, he asks for a loan in the bank
 - (c) Raul recently bought a car. To face any emergency, he has purchased an insurance in a financial institution
 - (d) Raul bought a car and rents it to other person. With this, he gets an additional income to spend with his family
12. Mauricio's parents give him S/ 40 weekly. From Monday through Friday he spends S/ 10 in transportation, S/ 7.5 in groceries and S/ 3 in school supplies. On Friday evenings, Mauricio gives Math lessons to his friend and receives S/ 10. How much money left does he have to go out and have fun with his friends on the weekend?
- (a) S/. 29.5
 - (b) S/. 9.5
 - (c) S/. 19.5
 - (d) S/. 40
13. Norma has elaborated a monthly budget in the following way:

Total INCOME	S/ 1800
Total EXPENDITURES	S/ 1700
SAVINGS	S/ 200

- Which is the error in Norma's budget?
- (a) Her income is greater than her expenditures
 - (b) Her savings are too low
 - (c) Her expenditures plus savings are greater than her income
 - (d) Her income plus savings are greater than her expenditures
14. Which of the following is an example of investment?
- (a) Diana is going to open a clothing shop with her savings
 - (b) Diana is going to save one half of her salary in the bank
 - (c) Diana is going to buy an insurance in case of an emergency
 - (d) Diana is going to give her savings to her unemployed sister
15. The Rodriguez and The Vera are families that have lived next to each other for several years and have decided to set up a business together. The total income of The Rodriguez is greater than the total income of The Vera. Can we say that The Rodriguez are in better conditions to invest in a new business?
- (a) Yes, because their income is greater
 - (b) No, because we have to calculate the budget and evaluate how much is left after the expenditures of each family
 - (c) No, The Rodriguez can lose everything tomorrow
 - (d) Yes, The Vera cannot invest as much as The Rodriguez in the new business

TENTH GRADE

1. Rebecca has saved S/ 10,000 in a moneybox at home. Her plan is to enroll in an English course next year and she needs all of the money she saved. Which is the safest place for her money?
 - (a) A closet in her bedroom
 - (b) A bank savings account
 - (c) In the house of a close friend
 - (d) Buying jewelry that she can sell later
2. Under which of the following circumstances would it be financially beneficial to you to borrow money to buy something now and repay it with future income?
 - (a) When you want to give tickets to your parents to travel to Europe
 - (b) When you want to purchase a videogame
 - (c) When you want to buy a motorcycle that would help you to get a job delivering pizza
 - (d) When you want to buy fashion clothes
3. David just found a job with a take-home pay of S/ 2,000 per month. He must pay S/ 1000 for rent and S/ 150 for groceries each month. He also spends S/ 250 per month on transportation and S/ 300 in movie outings and restaurants. How many months will it take him to accumulate savings of S/ 600.
 - (a) 1 month
 - (b) 2 months
 - (c) 3 months
 - (d) 4 months
4. Jose and Manolo work together in the finance department of the same company and earn the same pay. Manolo spends his free time taking work-related classes to improve his computer skills; while Jose spends his free time socializing with friends and working out at a fitness center. After five years, what is likely to be true?
 - (a) Jose will make more because he is more social
 - (b) Jose will make more because Manolo is likely to be laid off
 - (c) Manolo will make more money because he is more valuable to his company
 - (d) Jose and Manolo will continue to make the same money
5. Pierina plans to pursue a Master in Finance. However, she does not have enough money to afford it and cannot wait to save because she would lose a year of studies and the possibility of getting a promotion at her job. Which of the following financial products would be the most adequate so that Pierina can afford her postgraduate studies?
 - (a) Savings account
 - (b) Mortgage loan
 - (c) Studies loan
 - (d) Credit card
6. Which of the following stakeholders does **NOT** belong to the financial intermediation process?
 - (a) People that have savings accounts
 - (b) People that have savings in panderos or juntas

- (c) Banks
 - (d) The State
7. Marta is 20 years old and has been working in a firm for several months. Overall, she feels satisfied with the labor conditions but contributing monthly to the AFP bothers her. Marta does not understand the usefulness of this contribution since she is very young and would prefer to have that money in her hands. What would you say to Marta?
- (a) Her monthly contribution is necessary to guarantee her own pension when she retires
 - (b) Her monthly contribution is necessary to guarantee the pensions of all the people working in her firm
 - (c) Her monthly contribution is not necessary since she is less than 30 years old and she can decide to stop contributing
 - (d) Her monthly contribution is not necessary and she can ask for a reimbursement
8. Which of the following utilizations of a credit card harms the financial system and the society?
- (a) When people use the credit card to pay for a family emergency
 - (b) When people use the credit card to buy things they will not be able to repay in the future
 - (c) When people use the credit card to buy medicines
 - (d) When people use the credit card to buy home appliances
9. Why is the financial system important for the society?
- (a) Because the banks supply products with better conditions for poor people
 - (b) Because it allows people without purchasing power to consume above their income
 - (c) Because it connects people who save with people who need resources in a secure and efficient way
 - (d) Because it increases the earnings of financial entities
10. Franco has decided to save a monthly amount in a financial entity. He has done some research about the annual interest rate that banks pay and the effective annual interest rate (EAIR). These are the results of his research:

Bank	Annual interest rate	EAIR
El Banquito	1.1%	1.2%
La Casa del Dinero	1.1%	1.8%
Nuestro Dinero	1.4%	1.5%

- With this information, which bank should Franco choose to open a savings account?
- (a) El Banquito
 - (b) La Casa del Dinero
 - (c) Nuestro Dinero
 - (d) It doesn't matter, all of them offer the same benefits
11. Which of the following is a passive product?
- (a) Credit card
 - (b) Mortgage loan

- (c) Savings account
 - (d) Consumption credit
12. Monica has S/. 4,000 and has decided to open a pet clinic. Can we say that Monica's decision is an investment?
- (a) Yes, because she is allocating money to an economic activity with the goal of earning more money
 - (b) Yes, because she is allocating money to an activity that will benefit all the dogs in her neighborhood
 - (c) No, because opening a business is a more active form of saving money
 - (d) No, because the money to open the business comes from a loan
13. Which is of the following is **NOT** a responsible management of personal finance?
- (a) Cristina is indebted with a bank and, in order to pay it, she is borrowing money from other bank
 - (b) Cristina is indebted with a bank and, in order to pay it, she is cutting her monthly expenses
 - (c) Cristina has a mortgage debt that is paying monthly for several years
 - (d) Cristina is saving to invest in a business in the future
14. Which of the following is an example of insurance?
- (a) Sebastian has an insurance against accidents in a financial entity
 - (b) Sebastian is saving in a Municipal Bank because he thinks it is a more trustable and secure entity
 - (c) Sebastian has invested his money in his father's business because he feels more secure
 - (d) Sebastian has bought a safe-deposit box to save his money and avoid any risk
15. Celia needs a loan to buy her sewing machine for her atelier. She has visited 3 banks and this is the information she collected about the interest rate and the effective annual cost rate (EACR):

Bank	Annual rate	EACR
Banco para la Microempresa	9%	10.2%
Banca Amiga	8%	10.5%
Banco La Union	8.5%	9.3%

Where should Celia ask for a loan?

- (a) Banco para la Microempresa
- (b) Banca Amiga
- (c) Banco La Union
- (d) It doesn't matter, all of them offer the same benefits

ELEVENTH GRADE

1. Rebecca has saved S/ 10,000 in a moneybox at home. Her plan is to enroll in an English course next year and she needs all of the money she saved. Which is the safest place for her money?
 - (a) A closet in her bedroom
 - (b) A bank savings account
 - (c) In the house of a close friend
 - (d) Buying jewelry that she can sell later
2. Under which of the following circumstances would it be financially beneficial to you to borrow money to buy something now and repay it with future income?
 - (a) When you want to give tickets to your parents to travel to Europe
 - (b) When you want to purchase a videogame
 - (c) When you want to buy a motorcycle that would help you to get a job delivering pizza
 - (d) When you want to buy fashion clothes
3. David just found a job with a take-home pay of S/ 2,000 per month. He must pay S/ 1000 for rent and S/ 150 for groceries each month. He also spends S/ 250 per month on transportation and S/ 300 in movie outings and restaurants. How many months will it take him to accumulate savings of S/ 600.
 - (a) 1 month
 - (b) 2 months
 - (c) 3 months
 - (d) 4 months
4. Jose and Manolo work together in the finance department of the same company and earn the same pay. Manolo spends his free time taking work-related classes to improve his computer skills; while Jose spends his free time socializing with friends and working out at a fitness center. After five years, what is likely to be true?
 - (a) Jose will make more because he is more social
 - (b) Jose will make more because Manolo is likely to be laid off
 - (c) Manolo will make more money because he is more valuable to his company
 - (d) Jose and Manolo will continue to make the same money
5. Nicolas makes S/. 1,800, spends S/. 1,400 to cover basic needs and allocates S/. 100 to savings. Each month, Nicolas knows that he has S/ 300 remaining to spend on entertainment activities. Today Nicolas visited a music store and saw a guitar that cost S/ 200 and he wants to purchase it because he wants to learn how to play one since he was a kid. What would you tell Nicolas?
 - (a) That he has the purchasing power to buy the guitar
 - (b) That he can buy the guitar but he won't be able to save this month
 - (c) That he should not buy the guitar since it wasn't planned in his budget
 - (d) That he should not buy the guitar because it will mess up his finances
6. Credit cards are useful for people since it allows them to satisfy needs during seasons in which they don't have enough purchasing power and enable them to pay for those things later. Which one of these is another benefit of using a credit card responsibly?

- (a) Having a good credit history, which facilitates the access to better credits
 - (b) Having an important savings level, which helps to cover unexpected expenses
 - (c) Having an intangible fund in case of an unemployment spell
 - (d) Having access to plastic money, which avoids the necessity of having money in the pocket
7. Piero earns S/. 1,200 monthly, of which he spends at least S/. 1,000 to satisfy basic needs. Recently, he saw a TV that he likes, but is very expensive. Piero has found out that he can access to an immediate loan without paperwork, but has to pay S/ 400 monthly for 12 months. What would you recommend to Piero?
- (a) To not accept the loan, because at this moment he has not the purchasing power to pay it
 - (b) He can accept the loan, but he will have to look for another job or ask for a raise
 - (c) To not accept the loan, since a TV is not a good investment
 - (d) He can accept the loan because his income is greater than the monthly payment
8. Melisa needs to send an amount of money to her uncle that lives abroad. She saw in the newspaper that there is bank that offers international transfers with a flat rate of S/ 2 for any transferred amount. When Melisa went to the bank, she was informed that the flat rate is valid only for those who are indebted with the bank. She looked again the newspaper and noticed that this condition is not specified. Do you think that Melisa's rights as a financial customer are being violated?
- (a) Yes, since the bank is using misleading advertising by omitting important information
 - (b) Yes, since the bank is offering a preferential treatment to those who have an account
 - (c) No, since she doesn't have an account, she simply cannot access the special offer
 - (d) No, because she is being informed that the actual rate S/. 10 and not S/. 2
9. In which situation, is it advisable to make the minimum payment of a credit card?
- (a) Always, to have more cash available
 - (b) In case of an emergency that impedes to make the full monthly payment
 - (c) In a month in which one wants to treat oneself
 - (d) In a month in which one has extra income
10. Three months ago, Brenda got a credit card at a bank. She made sure to read all the contract before signing it. Since then, she has been very responsible with the credit card. However, in her current monthly account, there is a purchase of an insurance that she never asked or authorized. She knows that her rights as consumer have been violated and she wants to present a complaint. Which is the best way to do it?
- (a) Presenting the complaint to the financial entity directly
 - (b) Presenting the complaint to the National Institute of Defense of the Competition and Protection of the Intellectual Property (INDECOPI)
 - (c) Presenting the complaint the Superintendence of Banks and Insurances (SBS)
 - (d) Presenting the complaint to the Association of Banks of Peru (ASBANC)
11. A year ago, Rodrigo got a loan from bank A and this month he will finish paying it without having any delay in his monthly payments. Rodrigo needs another loan, so he approached to bank B. The bank B checked his credit history by verifying Rodrigo's status in a risk central. When Rodrigo noticed that he was found in the central risk system, he got worried and thought that he wouldn't get the loan from bank B. What would you say to Rodrigo?

- (a) To not worry because if he paid his previous loan to bank A without problems, he has a good credit history which will help him to get the loan from bank B
 - (b) That he has to complain in INDECOPI because he should not be reported in the risk central
 - (c) To not worry because bank B does not use the information of the risk central. They just check it to fulfill the paperwork
 - (d) That bank A made a mistake and that he has to ask them to erase his information from the risk central
12. Select which one of these institutions is in charge of the regulation and supervision of financial entities, insurances and the private pensions system:
- (a) Superintendence of Banks and Insurances (SBS)
 - (b) National Institute of Defense of the Competition and Protection of the Intellectual Property (INDECOPI)
 - (c) Central Bank of Peru (BCRP)
 - (d) Association of Banks of Peru (ASBANC)
13. After several years of saving under the mattress, Susana opened a savings account in the bank. For her bad luck, the bank broke a few months after and she does not know what to do because she is afraid of losing the S/ 30,000 that she had in her account. What would you tell Susana?
- (a) To not worry, because the State will give her back her money
 - (b) To not worry, because her savings are secured with the Secure Deposit Fund (FSD)
 - (c) That she took a risk and pitifully she lost her savings
 - (d) That not everything is lost because she can recover 20
14. Roberto is moving and he is looking for an apartment to rent for the next two years. Recently, he found a place that he likes, but he can afford it with his current salary and savings. Given this, Roberto thinks that each month he could use his credit card to pay the rent. What would you tell Roberto?
- (a) That he won't be able to make it, because the withdrawal of cash is limited using a credit card
 - (b) That what he thinks is not advisable since he does not have enough purchasing power and getting indebted using a credit card is very expensive
 - (c) To do it because the purpose of a credit card is to cover expenses that are not affordable with the monthly income
 - (d) To do it because he won't have to pay interests
15. Alberto has done some purchases with his credit card that were over his purchasing power. The bank that gave him the credit card has blocked it and do not want to give him another loan. Alberto knows that he has a lot of debts but he does not understand the reason of not being able to get another loan because, according to him, he is the only one who is being injured. What would you tell Alberto?
- (a) That the irresponsible use of the credit card also injures the firms, since they won't be able to receive the payment for the products that Alberto acquired
 - (b) That the irresponsible use of the credit card also injures the financial system, since the bank has done some expenses that won't be able to recover
 - (c) That the irresponsible use of the credit card also injures his children because they will have less opportunities due to the debts he has
 - (d) That he is right, nobody, besides him, is injured in this situation

B.2 Teachers

1. Rebecca has saved S/ 10,000 in a moneybox at home. Her plan is to enroll in an English course next year and she needs all of the money she saved. Which is the safest place for her money?
 - (a) A closet in her bedroom
 - (b) A bank savings account
 - (c) In the house of a close friend
 - (d) Buying jewelry that she can sell later
2. Under which of the following circumstances would it be financially beneficial to you to borrow money to buy something now and repay it with future income?
 - (a) When you want to give tickets to your parents to travel to Europe
 - (b) When you want to purchase a videogame
 - (c) When you want to buy a motorcycle that would help you to get a job delivering pizza
 - (d) When you want to buy fashion clothes
3. David just found a job with a take-home pay of S/ 2,000 per month. He must pay S/ 1000 for rent and S/ 150 for groceries each month. He also spends S/ 250 per month on transportation and S/ 300 in movie outings and restaurants. How many months will it take him to accumulate savings of S/ 600.
 - (a) 1 month
 - (b) 2 months
 - (c) 3 months
 - (d) 4 months
4. Jose and Manolo work together in the finance department of the same company and earn the same pay. Manolo spends his free time taking work-related classes to improve his computer skills; while Jose spends his free time socializing with friends and working out at a fitness center. After five years, what is likely to be true?
 - (a) Jose will make more because he is more social
 - (b) Jose will make more because Manolo is likely to be laid off
 - (c) Manolo will make more money because he is more valuable to his company
 - (d) Jose and Manolo will continue to make the same money
5. Julio is a house painter. He has been asked to paint a house the next Monday at 8am, but he was planning to help his brother painting his house at the same time the same day. Julio decides to refuse the offer and help his brother. What is the opportunity cost of helping his brother?
 - (a) The amount he would have earned if he have accepted the offer
 - (b) A little bit more than the amount he would have earned for painting the house
 - (c) A little bit less than the amount he would have earned for painting the house
 - (d) Julio does not have an opportunity cost for helping his brother
6. Which of the following is **NOT** a role that families play in the economy?
 - (a) Establish regulatory measures to economic activities
 - (b) Consumption of goods and services offered in the market
 - (c) Be employed by the firms that produce goods and services

- (d) Require a minimum quality of the goods and services they consume
7. Mauricio's parents give him S/ 40 weekly. From Monday through Friday he spends S/ 10 in transportation, S/ 7.5 in groceries and S/ 3 in school supplies. On Friday evenings, Mauricio gives Math lessons to his friend and receives S/ 10. How much money left does he have to go out and have fun with his friends on the weekend?
- (a) S/. 29.5
 (b) S/. 9.5
 (c) S/. 19.5
 (d) S/. 40
8. The Rodriguez and The Vera are families that have lived next to each other for several years and have decided to set up a business together. The total income of The Rodriguez is greater than the total income of The Vera. Can we say that The Rodriguez are in better conditions to invest in a new business?
- (a) Yes, because their income is greater
 (b) No, because we have to calculate the budget and evaluate how much is left after the expenditures of each family
 (c) No, The RodrÃguez can lose everything tomorrow
 (d) Yes, The Vera cannot invest as much as The Rodriguez in the new business
9. Pierina plans to pursue a Master in Finance. However, she does not have enough money to afford it and cannot wait to save because she would lose a year of studies and the possibility of getting a promotion at her job. Which of the following financial products would be the most adequate so that Pierina can afford her postgraduate studies?
- (a) Savings account
 (b) Mortgage loan
 (c) Studies loan
 (d) Credit card
10. Which of the following utilizations of a credit card harms the financial system and the society?
- (a) When people use the credit card to pay for a family emergency
 (b) When people use the credit card to buy things they will not be able to repay in the future
 (c) When people use the credit card to buy medicines
 (d) When people use the credit card to buy home appliances
11. Franco has decided to save a monthly amount in a financial entity. He has done some research about the annual interest rate that banks pay and the effective annual interest rate (EAIR). These are the results of his research:

Bank	Annual interest rate	EACR
El Banquito	1.1%	1.2%
La Casa del Dinero	1.1%	1.8%
Nuestro Dinero	1.4%	1.5%

With this information, which bank should Franco choose to open a savings account?

- (a) El Banquito

- (b) La Casa del Dinero
 - (c) Nuestro Dinero
 - (d) It doesn't matter, all of them offer the same benefits
12. Which of the following is an example of insurance?
- (a) Sebastian has an insurance against accidents in a financial entity
 - (b) Sebastian is saving in a Municipal Bank because he thinks it is a more trustable and secure entity
 - (c) Sebastian has invested his money in his father's business because he feels more secure
 - (d) Sebastian has bought a safe-deposit box to save his money and avoid any risk
13. Nicolas makes S/. 1,800, spends S/. 1,400 to cover basic needs and allocates S/. 100 to savings. Each month, Nicolas knows that he has S/ 300 remaining to spend on entertainment activities. Today Nicolas visited a music store and saw a guitar that cost S/ 200 and he wants to purchase it because he wants to learn how to play one since he was a kid. What would you tell Nicolas?
- (a) That he has the purchasing power to buy the guitar
 - (b) That he can buy the guitar but he won't be able to save this month
 - (c) That he should not buy the guitar since it wasn't planned in his budget
 - (d) That he should not buy the guitar because it will mess up his finances
14. Three months ago, Brenda got a credit card at a bank. She made sure to read all the contract before signing it. Since then, she has been very responsible with the credit card. However, in her current monthly account, there is a purchase of an insurance that she never asked or authorized. She knows that her rights as consumer have been violated and she wants to present a complaint. Which is the best way to do it?
- (a) Presenting the complaint to the financial entity directly
 - (b) Presenting the complaint to the National Institute of Defense of the Competition and Protection of the Intellectual Property (INDECOPI)
 - (c) Presenting the complaint the Superintendence of Banks and Insurances (SBS)
 - (d) Presenting the complaint to the Association of Banks of Peru (ASBANC)
15. Roberto is moving and he is looking for an apartment to rent for the next two years. Recently, he found a place that he likes, but he can afford it with his current salary and savings. Given this, Roberto thinks that each month he could use his credit card to pay the rent. What would you tell Roberto?
- (a) That he won't be able to make it, because the withdrawal of cash is limited using a credit card
 - (b) That what he thinks is not advisable since he does not have enough purchasing power and getting indebted using a credit card is very expensive
 - (c) To do it because the purpose of a credit card is to cover expenses that are not affordable with the monthly income
 - (d) To do it because he won't have to pay interests

C Normalization of GPAs

Using raw GPAs as a performance measure poses several problems since they are not comparable across schools due to differential school quality, grade inflation, grading criteria, among other reasons. To deal with this issue, we construct *school quality normalized* GPAs [Frisancho et al., 2016]. For each subject i in grade g and school s , we define the adjustment factor, A_{igs} :

$$A_{igs} = \frac{\overline{\text{GPA}}_{igs}}{\overline{\text{Exam Score}}_{gs}} \div \frac{\overline{\text{GPA}}_{ig}}{\overline{\text{Exam Score}}_g} \quad (\text{C.1})$$

where $\overline{\text{GPA}}_{igs}$ is the average GPA for subject i in grade g and school s . Similarly, $\overline{\text{Exam Score}}_{gs}$ is the average score in the baseline financial literacy exam for grade g in school s . $\overline{\text{GPA}}_{ig}$ and $\overline{\text{Exam Score}}_g$ are the average GPA for subject j and exam scores for all students in the same grade, irrespective of the school.

The ratio in the numerator in (C.1) should go up if the school is inflating grades relative to its true quality, for example. If the average GPA in math at grade g and school s is 8/10 but the average exam score for these students is only 5/10, grade g in school s is worse than the raw GPAs suggest. After all, since all students in the same grade take the same baseline financial literacy exam and are graded with the same objective criteria, $\overline{\text{Exam Score}}_{gs}$ should be a good proxy for the quality of the school on a unique scale. The ratio in the denominator in (C.1) is just a constant for all the students in the same grade and it takes the adjustment factor by subject to a common scale.

Define the school quality normalized GPA in subject i for student n in grade g and school s as:

$$\text{GPAnorm}_{nigs} = 100 \left(\frac{\widetilde{\text{GPA}}_{nigs}}{\widetilde{\text{GPA}}_{ig}^{\max}} \right)$$

where:

$$\widetilde{\text{GPA}}_{nigs} = \left(\frac{\text{GPA}_{nigs}}{A_{igs}} \right)$$

and $\widetilde{\text{GPA}}_{ig}^{\max}$ is just the maximum $\widetilde{\text{GPA}}_{nigs}$ in a given grade. Notice that this normalization penalizes grade inflation through a higher A_{igs} .