Financial Education and Behavior Formation:
Large-Scale Experimental Evidence from Brazil
(DRAFT for review)
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Abstract
This paper demonstrates that a high-quality financial education program targeted at youth can improve financial knowledge, attitudes, and behavior. We collaborate with a national partnership of major financial and educational actors in Brazil to conduct a large scale randomized evaluation of a comprehensive financial education program for high school students. The study spans 6 states, 868 schools, and approximately 20,000 students aged 15 to 17. The program increases student financial knowledge by a quarter of a standard deviation and shifts the distribution of financial proficiency scores rightward. The change in knowledge leads to a 1.4 percentage point increase in savings -- a large and economically significant effect. A complementary workshop for parents induces their children to save even more. Both current attitudes and new forward-looking indices of intentions to save and financial autonomy improve significantly. “Trickle up” impacts on parents are also significant, with improvements in parent financial knowledge and savings and spending behavior. The scale and geographical scope lend strong external validity to the findings.

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1. Introduction

Navigating today’s financial markets can be a difficult task. Financial systems have grown in complexity and sophistication, often outpacing the capacity of individuals and families to make informed financial choices (Lusardi and Mitchell, 2007; Lusardi et. al., 2010). Personal financial decisions are further complicated by the rapid infusion of cleverly marketed consumer products that are often coupled with expensive credit and installment plan offers. These advancements have heightened the risk of misplaced or misinformed spending decisions that can lead to real and long-lasting financial burdens on household budgets. Indeed, the personal bankruptcy rates even in developed countries such as the US have skyrocketed, increasing by as much as 20 percent annually during the recent financial crisis.¹

The policy response to these troubling trends has been to introduce proactive measures on both the supply and demand side. On the supply side, many countries now have Consumer Protection Bureaus that are tasked with ensuring financial providers adopt and adhere to transparent consumer disclosure laws. On the demand side, there has been a significant push to educate the public on financial matters through various financial literacy programs, though rigorous evidence on their effectiveness remains scarce (Cole, Sampson, and Zia, 2011).

This paper makes a significant contribution to the literature by experimentally testing a comprehensive approach to financial education for youth in Brazil. We collaborate with a national partnership of major financial and educational actors in Brazil and study the causal impact of their state-of-the-art financial education program for high school students. We measure changes in financial knowledge, preferences and attitudes towards current and future financial decisions, and also savings and spending behavior.

We focus our study on youth for a number of important reasons. First, good financial habits formed at an early age are likely to benefit schooling, employment, and standards of living throughout adulthood. Second, well informed students have the opportunity to impact not only

their own financial choices, but to also act as agents of change in their households’ financial decisions. Third, behavioral evidence suggests that individuals display anomalies in their preferences and that these anomalies may be related to variations in cognitive ability. In a study of Chilean high school students, Benjamin et al. (2012) find evidence that small-stakes risk aversion and short-run discounting are less common among those with higher standardized test scores. This raises the question of whether improving knowledge and understanding of inter-temporal choices for youth can lower the demands on cognitive resources and improve current and future financial decisions and attitudes. Further, the focus on youth leverages their learning capacity as students who are primed to absorb, recall, and apply learning in school. Finally, despite the potential benefits of financial education for youth, we simply do not know what works and the few existing studies either show conflicting results, are too narrowly focused, or suffer from important identification concerns.\(^2\)

To date, our study is the largest randomized evaluation in the financial education literature, with a sample of six Brazilian states – São Paulo, Rio de Janeiro, Ceará, Tocantins, Minas Gerais, and Distrito Federal; 868 public high schools; and approximately 20,000 students. As part of the study design, schools were first stratified by state, pair-wise matched by school and community characteristics, and then randomly assigned to treatment and control. The study spanned three academic semesters, from August 2010 to December 2011, and data were collected in three rounds consisting of baseline (August 2010), follow-up 1 (December 2010), and follow-up 2 (December 2011).

The financial education program included study materials, teacher training, monitoring, and participation awards. Unlike typical financial education programs that involve external instructors providing one-off classes on financial education, our program spanned 18 months, was delivered by regular teachers, and was integrated in classroom curricula of Mathematics, Science, History, and Portuguese. The instruction used new textbooks with interactive classroom exercises on financial education themes, take-home exercises such as creating

\(^2\) See Section 2 of this paper for a detailed discussion of the existing literature.
household budgets with parents, and role playing assignments, such as visiting local markets and organizing class graduation parties. The curriculum was complemented by extensive teacher training, web learning tools, and instructor handbooks. Finally, schools with high levels of survey participation received awards and public recognition. As such, the intensity of treatment of this program was much stronger than other financial education interventions.

The results show significant improvements in financial knowledge, attitudes, and behavior. Specifically, we find a quarter of a standard deviation increase in the financial knowledge of students, as measured by a SAT-like financial proficiency test. Importantly, the entire distribution of scores shifts to the right with students at all levels of capability showing marked improvements in testing. The knowledge gains help students improve their current financial behavior, with a statistically significant increase of 1.4 percentage points in savings and significant improvements in the likelihood of making budgets and negotiating prices and payment methods.

While these changes in current behavior are important as many students in our sample have part-time jobs and hence the option to save, of equal importance are their preferences and attitudes towards future financial decisions. To better understand this potential, a local education survey firm specializing in school based evaluations helped develop and test two new forward looking indicators of financial behavior in our sample – student financial autonomy and intention to save. The financial autonomy index aggregates a series of questions designed to measure whether students feel empowered, confident, and capable of making independent financial decisions and influencing the financial decisions of their households. The intention to save index includes a series of questions that identify preferences over future and hypothetical savings and spending scenarios. The analysis finds strong and statistically significant treatment effects on both these measures, with an effect size ranging between 0.08-0.12 of a standard deviation.
Next, we turn to the household and investigate treatment effects on parents of high school students in two distinct ways. First, we measure “trickle-up” impacts of our financial education treatment for students. Many of the take-home exercises involved interaction with parents, such as making household budgets or researching and comparing interest rates on savings accounts. We survey parents and identify several important findings. As proof of concept, we find that parents in treatment schools are significantly more likely to report that their children discuss financial matters with them at home and that they volunteer to help organize household budgets. In addition, we detect improvements in parental financial knowledge on standard financial literacy questions used in the literature. And finally, we find significant improvements in parental financial behaviors, with an increase of 0.67 percentage points in savings and improvements in the likelihood of keeping household budgets.

We also study household level effects through a standard adult workshop on financial education for parents. This involved a DVD-based intervention where parents in treated schools were randomly assigned to either a financial education screening or a health education screening. Although the attendance at these workshops was low, we detect further improvements in the savings rates of students from families that attended the financial education workshops. Hence, these workshops helped parents reinforce the messages taught to the students.

Overall, our study shows that financial education can be an effective tool in improving financial outcomes of students when delivered in a comprehensive manner and over a significant period of time. Also, key complementary benefits can be derived by involving the entire household, students and parents, as indicated by our trickle up and parents’ workshop impacts. Finally, it is important to distinguish our study from others in the literature based on scope and scale. Specifically, the large sample size and breadth of coverage through six of the most populated states in Brazil provides strong support for the external validity of our findings and the generalizeability of the results. Moreover, our careful evaluation has led to significant and real policy impact as the Ministry of Education in Brazil has recently agreed to expand the financial
This education program to 5,000 new schools across the country after reviewing evidence from our study. Further, other countries in the region have approached us and our country partners so that they can learn and adopt a similar program in their respective education systems.

This paper proceeds as follows. Section 2 summarizes the literature on financial education for youth and details the Brazilian context. Section 3 discusses the financial education curriculum, and Section 4 presents the research and sampling methodology as well as the study timeline. Section 5 describes the data collection, and Section 6 presents summary statistics and analysis on process evaluation. Section 7 discusses the main results, Section 8 discusses the impact of our study, and finally Section 9 concludes.

2. Background and Context

2.1 Financial Education for Youth

There is a growing literature on financial education and its determinants for youth, but much of the evidence comes from developed rather than developing countries. A consistent finding among these studies is that financial literacy tends to peak among adults in the middle of the life cycle, and is significantly lower among youth. In the U.S., for example, those in the prime age group (25-65) tend to perform about five percent better on financial literacy questions than those under 25 (Lusardi and Mitchell, 2011a). Strikingly, Lusardi et al. (2009b) find that less than a third of American teenagers (ages 12-17) possess basic knowledge of interest rates, inflation, and risk diversification. Mandell (2006) notes that there is even evidence that youth financial literacy financial has been declining in the U.S. since the late 1990s. Similar evidence comes from Australia where Beal and Delpachitra (2003) identify low levels of financial literacy financial among youth.

Perhaps in response to such trends, policymakers around the world have made financial education for youth a priority, with many school based initiatives now part of education reform. Yet, the impacts of such school programs on financial knowledge and behavior are still not well understood and even contradictory. For example, Bernheim et al. (2001) employ a difference-
in-difference approach to analyze the impact of state high school financial education mandates on savings behavior in the U.S. and find that mandates appear to effectively increase exposure to financial education, and have a significant subsequent effect on future savings. However, Cole and Shastry (2009) replicate and extend the analysis using a much larger sample from U.S. census data and find, in contrast, no significant impact of high school financial education on future savings.

Other studies have shown mixed results also. Carlin and Robinson (2010) study the effects of a financial literacy course for high school students in the U.S. which involved role-playing fictitious budget situations following 19 hours of financial training that included credit card management, taxes, budgeting, and simple investments (Junior Achievement Finance Park). The simple pre-post analysis shows that training raised completion rates (successfully crafting a balanced budget) from 5 percent to over 50 percent and savings increased four-fold from pre-treatment levels. At the same time, however, treated students were worse at judging a health insurance plan which had higher monthly premiums but lower out-of-pocket costs. Similarly, Walstad et al. (2010) study the effects of a DVD-based curriculum for high school students on financial knowledge – Financing Your Future. The five video segments cover such topics as saving, money management, banking, credit and debt, and investing, and add up to six hours of instruction. They find that students who participated in the education program showed a significant gain in financial knowledge (as measured by pre-test and post-test scores) compared to students in a matched control group, but they do not study subsequent behavior change.

Randomized evaluations of school based financial education programs are scarce; in fact we are aware of only two other such studies. Berry et al. (2012) conduct an evaluation of a program offering voluntary after-school clubs in Ghana for primary and junior high students in 135 schools over a 10 month period. The study randomly assigns a group of 5th and 7th graders to a social and financial treatment and another to basic training. It is not clear how exposed student are to financial decision making at such a young age, and eliciting reliable and consistent responses in this age group is generally difficult; hence there are some measurement concerns.
The treatment is also short and participation voluntary. The findings are unsurprisingly muted – while the study identifies some effects on savings, there are no improvements in financial knowledge, test scores, or social and psychological measures.

Another experiment is a study among 17 to 19 year old high school students in Italy. Becchetti et al. (2011) offer a 16 hour long course on finance over three months and find positive effects on financial knowledge. However, a follow-up study (Becchetti and Pisani, 2012) cautions that these increases may be due to students adapting to repeated financial literacy tests rather than conceptual learning.

One other very recent study is an evaluation of financial education in German high schools. Luhrmann et al. (2012) evaluate 90 minute financial education sessions delivered to 14-16 year old students in lower stream high schools. While their findings show significant improvements in financial knowledge and a hypothetical savings scenario, their follow-up period is very short, only 1-3 weeks after the intervention. Furthermore, schools are chosen to receive financial education sessions based on how busy teachers feel they are with students prior to the end of the academic year, which raises serious selection concerns since teachers in control schools may also be dealing with relatively poorly performing students or other unobserved underlying student, class, or school characteristics. Finally, their sample size is extremely small, less than 50 schools in the entire sample some of which they had to drop. Such a small sample raises concerns about external validity of their findings.

While the lack of strong evidence on the impact of financial education for youth is striking, one key lesson that emerges from this work is that financial education tends to be more effective when it is targeted to the specific needs and desires of the audience. For instance, Varcoe et al. (2005) evaluate a program (Money Talks) in which teenagers in various settings (including juvenile halls, migrant education programs, pregnancy and parenting programs, public high schools, and youth groups) were solicited with regard to topics, format, and when and where to receive financial education information. The curriculum took the form of four newsletters
targeted to 13-18 year-olds which covered different topics, including savings habits, shopping tips, car costs, and money values. The authors find positive changes in both knowledge and behavior, although self-selection and the requirement of a parent-signed permission slip raise some important identification concerns. The apparent success of the targeting strategy behind this program, however, seems to be corroborated by Mandell and Klein (2007), who highlight the importance of motivation and goal-setting in increasing the relevance of financial education for youth.

The importance of targeting has been borne out in studies outside the youth segment as well. For example, Duflo and Saez (2011) find positive impacts of a financial education program focused on retirement savings for university employees. Similarly, the only currently completed randomized evaluation of a financial education program for households in developing countries (Cole, et al., 2011) finds significantly greater effects of financial education on the likelihood of opening a bank account for household heads with low education and below median baseline levels of financial literacy.

Against the state of the existing literature on financial education, our study fills an important gap by focusing on financial education in high schools and using rigorous methodology. Specifically, our study brings together: (1) a randomized evaluation methodology, (2) a comprehensive financial education intervention that lasted 3 full semesters over 18 months, (3) a very large sample size (868 schools and nearly 20,000 students), (4) widespread coverage over six states in Brazil, and (5) a unique set of forward looking outcome measures developed specifically for the youth segment of the population. As such, our study offers new insights into the impact of financial education for youth.

2.2 The Brazilian Context

Brazil’s low savings and investment rates and low levels of awareness on financial matters among the population have triggered a national policy response led by the financial sector. National savings are around 16 percent of GDP overall and levels of financial awareness are
low. A recent survey conducted by the Instituto Data Popular in 2008 shows that 82 percent of Brazilian consumers are unaware of the interest rate when borrowing money. Against this background, the financial sector recently introduced the idea of financial literacy as a mechanism to improve awareness and understanding, build personal finance skills, stimulate savings, and broaden the use of financial services, with the goal to improve consumers’ ability to make decisions that are beneficial to their financial well-being.

The early steps in the establishment of a national policy of financial education were taken in the mid-2000s. In 2007, the Supervisory and Regulatory Committee of Financial Systems, Capital Markets, Private Insurance and Social Welfare (COREMEC) approved the creation of a working group to develop and propose, under the coordination of the Brazilian Securities and Exchange Commission (Comissão de Valores Mobiliários, CVM), a National Strategy for Financial Education (ENEF). This group currently draws representatives from public financial institutions including the CVM itself, the Central Bank, and pensions and insurance regulatory agencies (Superintendência Nacional de Previdência Complementar and Superintendência de Seguros Privados, SUSEP). The group also includes civil society institutions and select private sector institutions such as the association of financial institutions (Associação Brasileira das Entidades dos Mercados Financeiro e de Capitais, ANBIMA), BM&F BOVESPA (the stock exchange), and the federation of banks (Federação Brasileira de Bancos, FEBRABAN).

The National Strategy was launched in 2009 with the goal of fostering a culture of financial education in the country, enabling citizens to make sound financial decisions, and contributing to the efficiency of financial markets. Its scope is national, targeting children, youth and adults, and its goals ambitious, involving a large sector of actors and a multiplicity of delivery mechanisms for financial education.

In parallel with the National Strategy, a Pedagogical Support Group (Grupo de Apoio Pedagógico, GAP) was established in 2008 to bring in the Federal Ministry of Education and the Municipal and State Secretariats of Education to work together with these financial institutions.
The creation of GAP was a critical step in mobilizing the development of a school curriculum for basic and high school education and planning for its introduction in public school education. The priority for the collaboration between top educators and financial sector experts was the design of the high school program, the first program that would be piloted to ascertain its value on youth’s behavior formation and their ability to function as a vehicle for social and household change. The plan was for financial education to be introduced not as a separate subject but as material professors could use to supplement their regular school curriculum.

In 2009, the World Bank was asked to come in to evaluate the impact of the high school pilot program, with the objective to apply rigorous economic research methods to establish the causal impact of financial education on students’ and their households’ financial knowledge, attitudes and behavior. The results would be used as an independent assessment to inform improvements to, and the eventual national scale up of, the program. The World Bank worked with GAP to agree on protocols of the study, including the scale of the pilot to ensure statistical power, the geographical scope to ensure external validity, the experimental design to ensure unbiased results, and roll-out of the pilot to ensure feasibility. The World Bank partnered with the Centro de Políticas Públicas e Avaliação da Educação (CAEd) for its experience and expertise in the design and implementation of student education surveys in Brazilian schools. The pilot was finally launched in 2010 according to the agreed protocols.

3. Financial Education Curriculum

The financial education curriculum consists of didactically innovative material designed to capture the interest of young adults and be relevant to their lives. It consists of 72 case studies that can be integrated into regular school subjects such as Mathematics, Portuguese, Science, Geography, and History. In contrast to typical seminar based financial literacy programs that are delivered in one shot and vary in length from 90 minutes to a few hours, the case study based program in our study provides material for between 72 and 144 hours of teaching (1-2 hours per case study), spread out over one and a half school years (three semesters).³ The

³ The material was developed by the Pedagogical Support Group (GAP: Grupo de Apoio Pedagógico), and the complete outline of the curriculum is in Appendix 2 of this paper.
material is interactive and includes exercises that the students complete with their parents (e.g. household budgeting and planning). In addition, the program trains teachers in advance through an introductory seminar, a reference DVD, and a training website which remains active throughout the program. The intensity and scope of the intervention is significantly stronger than is the case in other financial education programs or evaluations.

The student textbook is divided into three blocks and covers nine different themes: family life, social life, personal property, work, entrepreneurship, large expenditures, public goods, country economy, and world economy. The themes are taught through 72 didactic situations (SDs) that include theoretical and applied content, exercises and activities, as well as self-evaluative questions. SDs make use of texts, stories, images, and tables to convey the material in an accessible way. SDs also contain “experiment” sections that are designed to make the material relevant to students’ daily life. For example, when discussing the international economy, students are asked to identify the imported products they use in everyday life. Each SD concludes with a short outline of what students are expected to learn.

The first three themes (family life, social life, and personal property) introduce students to the concepts of budgeting, separating personal and family expenditures, and differentiating between fixed and variable spending. These concepts are similar to those used in standard financial education programs for adults, but adapted and simplified for the youth audience. For example, instead of making a household budget which student may not yet be responsible for, they are instead asked to involve their parents in discussing and writing out a household budget. Not only do such exercises promote student financial education, but they also promote dialogue on financial matters between students and their family financial decision makers.

The work and entrepreneurship themes discuss professional growth and practical issues in starting and running a business. Students are asked to think about their professional ambitions and talents and relate them to different sorts of jobs or business opportunities. Concepts such
as gross and net income, structural unemployment, retirement planning, as well as the main aspects of the birth and execution of a good business idea are analyzed.

In the large expenditures theme, students experience situations that involve large financial outlays, such as home purchases or planning a school graduation party. One of the exercises involves students fundraising, planning, and organizing an end-of-year class celebration.

The public goods theme addresses several issues related to the use and financing of public goods and services, among them the payment of taxes, government efficiency, corruption, and basic economic notions of the nature of public goods.

Finally, the country economy and world economy themes expose students to aspects of the national and international economy that are relevant for their personal lives. Some of the important concepts discussed with students are inflation, the law of supply and demand, the concept of minimum wage, supervisors of the national financial system, imports and exports, international economic blocks, and measures of a country’s wellbeing.

Teacher guidelines explain how to integrate the financial education case studies in the regular curriculum. These can be used in any order at the discretion of the teacher, but with strict guidelines on exposure of conceptual material.

4. Research Design, Sampling, and Timeline
This section discusses our research design, sampling methodology, and project timeline.

4.1 Research Design
The study was designed in advance of program implementation as a randomized control trial to ensure that the causal effects of the program could be measured accurately and precisely. The scale and scope was defined to ensure that the study would have enough statistical power to measure and detect impacts on all dimensions of interest and enough coverage to have strong
external validity. Finally, variation in treatment was introduced to better understand household dynamics.

The study evaluates two interventions in public high schools, one targeted to high school students and one to their parents. Treatment for the student intervention was assigned at the school level, whereas treatment for the parent intervention was assigned at the individual level within student treatment schools.\footnote{Due to political constraints, we were unable to extend the parent intervention to control schools.}

Student treatment schools received financial education material and teacher training. Control schools did not receive any material or training, but participated in surveys and testing in the same manner as the treatment schools. One eleventh grade class in each school participated in the pilot program and study. These classes moved on to twelfth grade by the end of the study, the last year of high school. Students in the sample were between 15 and 18 years of age at the start of the intervention, with high repetition rates explaining the age variation. In schools that had more than one section in eleventh grade at the start of the pilot, the school chose which section would participate in the study.

In year two, parents of students in treatment schools were invited to participate in a school workshop. At the workshop, they were directed to watch either a financial education video (workshop treatment group) or a health education video (workshop control group) through random assignment. Parents learned which video they had been assigned to watch only \textit{after} they arrived at the workshop. The purpose of the parents’ workshop was to reinforce the messages taught to students in class, and to measure the combined impact of parent and student interventions on household level financial outcomes and decision-making. The reason for showing a health education video to the workshop control group was that our counterparts did not think it was logistically and politically feasible to invite only certain parents within a school to a workshop, but not others. We do not expect the health video to have an impact on financial outcomes.
The figure below summarizes the study design:

<table>
<thead>
<tr>
<th></th>
<th>Group 1 Schools</th>
<th>Group 2 Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Student Intervention</strong></td>
<td>Control</td>
<td>Treatment</td>
</tr>
<tr>
<td><strong>Parent Intervention</strong></td>
<td>--</td>
<td>½ Treatment, ½ Control</td>
</tr>
</tbody>
</table>

### 4.2 Sample Selection and Randomization for Student Intervention

Brazil is divided into 26 states and a Federal District. The Federal District and five states were part of the study, including three of the most populous and developed states (São Paulo, Minas Gerais, and Rio de Janeiro), and two states (Ceará and Tocantins) that represent the less developed areas of Brazil. In 2009, the Federal District had the highest GDP per capita in Brazil (US$ 28,951). Minas Gerais, Rio de Janeiro and São Paulo are located in the Southeast, with GDP per capita of US$ 8,289, US$ 12,524, and US$ 14,872. Ceará and Tocantins are located in the Northeast and North of Brazil with GDP per capita of US$ 4,399 and US$ 5,960, respectively.

In April and May 2010, the Secretariat of Education in each state assembled a list of public high schools that volunteered to participate in the financial education pilot program, totaling 815 schools. We divided these schools into a treatment and control group through stratified and matched randomization as soon as we received each list, so that the teacher training for treatment schools could be organized and conducted before the mid-year school break in July. São Paulo being the state with the largest number of schools sent four separate lists on different dates. In addition, one of the project’s partner institutions (Instituto Unibanco) provided us with an additional list of 101 public schools that they partnered with in Rio de Janeiro, São Paulo, Minas Gerais, and the Federal District.
For each list, we first stratified schools by whether they were located in a municipality with above or below median number of financial institutions per capita. Within strata, we formed matched pairs of schools and randomly assigned one school in each pair to be in the treatment group and the other school to be in the control group. We matched on the following school and municipal variables to improve balance on these characteristics across the treatment and control groups: GDP per capita of the municipality where the school is located, savings volume per capita of the municipality where the schools is located, number of students in the school, number of teachers in the school, school drop-out rate, and school continuation rate (percent of students moving on to the next grade)\(^5\). We chose these variables since they may be correlated with the impact of the material on financial knowledge, attitudes, and behavior. We were not able to match on variables collected through our surveys because the randomization had to take place before the baseline survey to enable the program to train the teachers on time. Municipal level variables used in the randomization come from the Brazilian Statistical Institute (IBGE) and refer to 2009. School level variables used in the randomization are for 2008 and were provided by the Federal Ministry of Education (2009 data was not yet available at the time of randomization).

Randomization was done by the authors by computer, implying that any differences across the treatment and control group are due to pure chance. After the randomization was completed, we had to move three control schools to the treatment group manually since some states requested that at least one school in each school district participate in the program. We chose these schools at random among the schools in the school district and drop them and their pairs from the analysis. Also, after the randomization was completed, but before the program was implemented, we discovered that twelve schools indicated by the Instituto Unibanco decided to not participate in the pilot. We drop these schools and their pairs from the analysis. In

\(^5\)For Ceará, we did not have number of teachers, drop-out rates, and continuation rates, so we matched on the remaining variables only. For Tocantins, we did not have drop-out rates and continuation rates, so we matched schools on the remaining variables only. Also, since all schools in the Federal District and in Minas Gerais (Juiz de Fora) were located in the same municipality, we only matched on school level variables in these states. For the Rio de Janeiro and São Paulo schools from the Instituto Unibanco list, we stratified by financial institutions per capita, but we only matched on school-level variables, not on municipality level variables, since many of these schools were located in the same municipalities, restricting the possible matches for the remaining schools.
addition, five schools had accidentally been listed twice (three were on both the state ministries’ and Instituto Unibanco lists and two were duplicated on the state ministries’ lists). We randomly chose which entry to drop (along with their pair). Another six treatment group schools from São Paulo did not participate in any of our surveys for unknown reasons. We drop these schools from our sample along with their pairs. In the end, we are left with 868 schools for the analysis – 432 in the treatment group and 436 in the control group. Table 1 lists the number of schools in each state. Most schools are located in São Paulo, Rio de Janeiro, and Ceará.

Table 1: Number of Schools in Sample by State

<table>
<thead>
<tr>
<th>State</th>
<th># treatment schools</th>
<th># control schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>São Paulo</td>
<td>180</td>
<td>182</td>
</tr>
<tr>
<td>Rio de Janeiro</td>
<td>132</td>
<td>133</td>
</tr>
<tr>
<td>Ceará</td>
<td>59</td>
<td>60</td>
</tr>
<tr>
<td>Federal District</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Tocantins</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Minas Gerais</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>432</td>
<td>436</td>
</tr>
</tbody>
</table>

4.3 Sample Selection for Parents’ Intervention

For the implementation of the parents’ workshops, treatment schools sent in a list of current students enrolled in the class receiving financial education during the spring of 2011. Only schools that sent the list were included in the study as this was taken as a signal that they were willing to implement the workshop. We used these lists instead of relying on information from earlier surveys because of potential student turnover from one school year to the next. A total of 264 treatment schools provided a list, totaling 8,534 students.

According to official statistics for school year 2009 from the National Institute for Education Studies and Surveys Anísio Teixeira (INEP), the average repetition rate was close to 25 percent and the drop-out rate was almost 10 percent in our sample.
We matched the lists with data from the baseline parent survey on the basis of the student’s name, and stratified and randomly assigned parents in each school into treatment and control groups. We used the following strata: (1) no baseline information on parents; (2) parent had low baseline financial literacy; and (3) parent had high baseline financial literacy. We defined the level of baseline financial literacy based on the number of correct answers to the two financial literacy questions asked on the survey. About 41 percent of parents did not answer any question correctly. We classify these parents as having low baseline financial literacy. Parents who answered one or two questions correctly are classified as having high financial literacy.

Each school that provided a list of their students received two separate lists in return: one with the names of the students whose parents would watch the financial education video during the school workshop (treatment group) and one with the names of students whose parents would watch the health video (control group). Schools were provided the financial education and health videos and parent exit questionnaires. Each school was responsible for organizing and implementing the workshop at a time of their choosing and administering the questionnaire at the end of the workshop.

4.4 Study Timeline

The study was designed and agreed in December 2009 and launched in the spring of 2010. The sample selection and randomization for the student intervention occurred in April-May 2010. The baseline survey was conducted in early August 2010 among students and parents in both treatment and control schools.

The financial education program was rolled out immediately after. By mid-August 2010, teachers began using the financial education materials in the classroom. The program continued until November 2011 for a total of three school semesters.
Over the course of this study, two rounds of follow-up surveys were conducted. The first follow-up survey was implemented in early December 2010, four months after the program started. The results of this survey measure the short-term effects of the program. A second follow-up survey was implemented in December 2011 to assess the longer-term impacts.

The parent intervention was introduced in May 2011, and parent outcomes recorded through an exit survey and the December 2011 follow-up survey.

5. Data Collection and Outcome Measures
For the data collection, we partnered with the Centro de Políticas Públicas e Avaliação da Educação (CAEd/UFJF), a research institute and survey firm with extensive experience in designing and implementing knowledge tests in Brazilian schools. CAEd has a wide network of supervisors and surveyors across Brazil, and was able to implement the survey across the schools in our sample at the same time.

Survey implementation took three days in each school during each survey round (baseline and both follow-up surveys). On the first day, CAEd staff administered a financial knowledge test and distributed parent questionnaires to students. The students were asked to take the parent questionnaire home, ask one of their parents to fill-out the questionnaire and return the questionnaire on one of the following days. On the second day, students filled out a self-administered questionnaire measuring financial attitudes and behavior. The third day provided an opportunity for any student who had missed one or both of the previous days to fill out the test and/or questionnaire. The student tests and questionnaires were administered in the classroom as a regular school exam, i.e. distributed to students, supervised by the surveyor and collected by the surveyor at the end of the allocated time.

5.1 Outcome Measures
The surveys included a financial knowledge test and behavioral questionnaire, which were the main instruments to collect data on outcome measures. The test was tailored to the program’s
material and objectives. Teachers were not privy to it at any point prior, after, or even the day of the tests and CAEd proctors were present in classrooms for the entire duration. The financial proficiency of students was then calculated based on performance on this knowledge test, with scores ranging from 0 to 100.

To assess the impact of the financial education program on future financial attitudes, new measures of financial autonomy and intention to save for students were developed. These measures are relevant to the age group of interest to signal current as well as future financial decision-making potential. Although high-school students may not be exposed to a full range of financial decisions, a large proportion of them are in the labor market or have other type of income. Many have the opportunity to use cell phones, credit cards and make purchases in installments. They also must decide to stay in school, and plan for their future studies and employment. Furthermore, financial education provides students with a knowledge base that will allow them to make more informed financial decisions in the future.

The financial autonomy measure captures student confidence, independence, and willingness to participate and influence household financial decisions. The survey asked students the extent to which they agree or disagree with statements on (i) reflexive autonomy, such as “I like to think carefully before deciding to buy something;” (ii) emotional autonomy, such as “I am prepared to talk about money with my parents;” and (iii) functional autonomy, such as “I always try to save some money to do things I really like.” Their responses were then aggregated into an index on financial autonomy (Micarello et al, 2012).

The intention to save measure aggregated responses to questions on (i) attitudes towards future behavior, such as “In my opinion, saving money every month is extremely beneficial;” (ii)

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7 Identical tests were administered in treatment and control schools. Tests were constructed using item response theory (which is also used to construct the GRE and SAT in the United States). This implies that a series of equivalent questions were used to test the same concept, leading to different combinations of questions on each test. The questions that each student received were thus likely to be different in each survey round and different students within the same class received different questions. This minimizes the risk that students simply remember the question and correct answer without truly understanding the question and also reduces the scope for cheating. Item response theory ensures that tests results are comparable across students and across time.
subjective norms and expectations, such as “My family has the habit of saving money every month;” and (iii) perceptions of controlling one’s behavior, such as “I believe I can save a little money every month.”

The student surveys also included a series of questions on current financial behavior, asking for example whether students keep track of expenses, whether they make a budget, and how much they save.

The parent questionnaires were kept short (about two pages) to increase the probability that parents would be willing to fill them out. These surveys included questions on socio-demographic characteristics, measured financial literacy through standard questions used in the literature, and elicited parents’ financial behavior regarding budgeting and savings. The parent surveys also asked whether parents talk to students about financial matters and whether students help to organize the household budget.

5.2 Survey Participation
Table 2 shows the number of schools, students and parents that participated in the surveys at baseline and at follow-up. At baseline, 866 out of 868 schools in our study sample participated in the survey, although two of these schools did not implement the financial literacy test and the parent questionnaire. In each follow-up survey, about 40 schools did not implement the survey. Reasons for non-implementation varied and were mostly related to scheduling difficulties. The schools that did not participate in the follow-up surveys were different in each round, so we have follow-up data for most schools from either follow-up 1 or follow-up 2.

After realizing that survey participation had dropped between baseline and follow-up 1, we provided incentives for survey completion during follow-up 2. Both treatment and control schools where more than 75 percent students completed at least 80 percent of the survey questions were entered into a lottery for one of twenty five computers. Despite this incentive, we did not have a higher number of schools participate in follow-up 2 than in follow-up 1.
However, a greater number of students within the participating schools answered the surveys in follow-up 2 than in follow-up 1. The number of students surveyed per school in follow-up 2 is still lower than in the baseline (about 22 vs. 28 students per school). One reason for this decline in the number of students per school is that drop-out rates are quite high in our sample (about 10 percent per year).

The numbers in Table 2 also illustrate the fact that student rotation is quite high in our study sample. The majority of students in follow-up 1 were also present in baseline (follow-up 1 was implemented in the same semester as the baseline, about four months apart). However, only about 60 percent of students in follow-up 2 were present at baseline (follow-up 2 took place about 16 months after baseline). With respect to the financial education program, this high rotation implies that more than a third of the sample was not exposed to the material for a full three semesters, but rather for only one or two semesters.\(^8\)

The participation in the parent questionnaire was quite high, considering that this questionnaire was self-administered at home. About 88 percent of students returned parent questionnaires at baseline. In the follow-up surveys, the participation rates in the parent questionnaire dropped to about 76 percent.

\(^8\)This high turnover of students in our sample needs to be interpreted in light of a systematic problem of school retention that characterizes secondary education in Brazil. Schwartzman (2010), compiling data from 1998-2008, shows that 21.3 percent of high school students repeat at least one year, either for lack of achievement or because they drop out. Comparing the same figure to countries with similar socioeconomic levels, such as Chile with 3.18 percent repeaters in secondary education and Argentina with 13.43 percent, and even to countries with lower socioeconomic levels, such as Peru with 5.62 percent of repeaters and Colombia with 2.70 percent, shows how complex the student retention problem is in Brazil.
Table 2: Survey Participation

<table>
<thead>
<tr>
<th></th>
<th>Financial Knowledge Test (Day 1)</th>
<th></th>
<th></th>
<th>Student Questionnaire (Day 2)</th>
<th></th>
<th></th>
<th>Parent Questionnaire (Take-Home)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Schools</td>
<td>Number of Students</td>
<td></td>
<td>Number of Schools</td>
<td>Number of Students</td>
<td></td>
<td>Number of Schools</td>
<td>Number of Parents</td>
</tr>
<tr>
<td></td>
<td>Baseline</td>
<td>Follow-up 1</td>
<td>Follow-up 2</td>
<td>Baseline</td>
<td>Follow-up 1</td>
<td>Follow-up 2</td>
<td>Baseline</td>
<td>Follow-up 1</td>
</tr>
<tr>
<td>Baseline</td>
<td>864</td>
<td>827</td>
<td>820</td>
<td>23290</td>
<td>15554</td>
<td>10941</td>
<td>864</td>
<td>808</td>
</tr>
<tr>
<td>Follow-up 1</td>
<td>829</td>
<td>793</td>
<td></td>
<td>17831</td>
<td>9305</td>
<td></td>
<td>829</td>
<td>771</td>
</tr>
<tr>
<td>Follow-up 2</td>
<td></td>
<td>824</td>
<td></td>
<td>18420</td>
<td></td>
<td></td>
<td>824</td>
<td>818</td>
</tr>
<tr>
<td>All Rounds</td>
<td>791</td>
<td></td>
<td></td>
<td>8410</td>
<td></td>
<td></td>
<td>791</td>
<td>5689</td>
</tr>
</tbody>
</table>

Note: This table shows the number of schools, students, and parents that participated in each survey. The numbers in the diagonals represent the schools, students or parents that took each survey. For follow-up 1 and 2, the numbers above the diagonal indicate how many of these schools also implemented the previous surveys. The last row, labeled “all rounds”, shows the number that was present in all surveys.


Table 3 displays pre-program summary statistics of school and student characteristics for treatment and control schools. The school level variables are for 2008 and were provided by the Federal Ministry of Education. As a result of the school matching and randomization...
procedures described in Section 4, the pre-program school characteristics are the same on average in the treatment and control group. For example, the drop-out rate is about 10 percent and the class passing rate is 74 percent.

The remaining variables in Table 3 were collected through the baseline survey that was conducted in August 2010. Student background characteristics show that 56 percent of students participating in the study were female, 67 percent had some form of income (from work or from parents) and about 35 percent were working at baseline. Additionally, 33 percent were beneficiaries of the Bolsa Familia government cash transfer program, indicating that they belonged to low-income households. On the parent side, about 60 percent of the students’ parents had less than high school education. In terms of financial behavior, about 45 percent of students reported that they save at least some of their income, only 11 percent made a list of their expenses every month, but 75 percent negotiated the price or payment method when making purchases. Overall, the data in Table 3 indicates that students’ background characteristics, as well as financial knowledge and behavior, were the same across the treatment and control group at baseline, as expected since treatment status was randomly assigned.
### Table 3: Pre-Program Summary Statistics

<table>
<thead>
<tr>
<th>School level variables used to form matched pairs for randomization</th>
<th>Number of schools</th>
<th>Number of students</th>
<th>Treatment group mean</th>
<th>Control group mean</th>
<th>p-value on difference: Treatment - Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students in school</td>
<td>867</td>
<td>669.86</td>
<td>640.20</td>
<td>0.366</td>
<td></td>
</tr>
<tr>
<td>Number of teachers in school</td>
<td>748</td>
<td>38.11</td>
<td>37.41</td>
<td>0.702</td>
<td></td>
</tr>
<tr>
<td>School drop-out rate</td>
<td>698</td>
<td>9.90</td>
<td>9.83</td>
<td>0.925</td>
<td></td>
</tr>
<tr>
<td>School-wide class passing rate</td>
<td>698</td>
<td>74.26</td>
<td>74.24</td>
<td>0.981</td>
<td></td>
</tr>
</tbody>
</table>

**Student background characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Number of schools</th>
<th>Number of students</th>
<th>Treatment group mean</th>
<th>Control group mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student is Female</td>
<td>864</td>
<td>26131</td>
<td>0.56</td>
<td>0.55</td>
<td>0.069*</td>
</tr>
<tr>
<td>Mother’s education: Less than high school</td>
<td>863</td>
<td>22474</td>
<td>0.43</td>
<td>0.45</td>
<td>0.392</td>
</tr>
<tr>
<td>Father’s education: Less than high school</td>
<td>863</td>
<td>22357</td>
<td>0.40</td>
<td>0.41</td>
<td>0.449</td>
</tr>
<tr>
<td>Student has failed at least 1 school year</td>
<td>863</td>
<td>22435</td>
<td>0.32</td>
<td>0.30</td>
<td>0.100</td>
</tr>
<tr>
<td>Receives Bolsa Familia cash transfer</td>
<td>863</td>
<td>22662</td>
<td>0.33</td>
<td>0.32</td>
<td>0.281</td>
</tr>
<tr>
<td>Student has computer with internet at home</td>
<td>863</td>
<td>22502</td>
<td>0.53</td>
<td>0.52</td>
<td>0.542</td>
</tr>
<tr>
<td>Student has income</td>
<td>866</td>
<td>24319</td>
<td>0.67</td>
<td>0.66</td>
<td>0.111</td>
</tr>
<tr>
<td>Student works</td>
<td>866</td>
<td>24303</td>
<td>0.35</td>
<td>0.35</td>
<td>0.902</td>
</tr>
</tbody>
</table>

**Student financial knowledge and behavior**

<table>
<thead>
<tr>
<th></th>
<th>Number of schools</th>
<th>Number of students</th>
<th>Treatment group mean</th>
<th>Control group mean</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial proficiency index</td>
<td>864</td>
<td>23255</td>
<td>50.15</td>
<td>49.80</td>
<td>0.461</td>
</tr>
<tr>
<td>Saves more than zero</td>
<td>866</td>
<td>24089</td>
<td>0.46</td>
<td>0.45</td>
<td>0.075*</td>
</tr>
<tr>
<td>Makes a list of all expenses every month</td>
<td>866</td>
<td>24080</td>
<td>0.11</td>
<td>0.10</td>
<td>0.680</td>
</tr>
<tr>
<td>Negotiates price or payment method</td>
<td>866</td>
<td>23867</td>
<td>0.76</td>
<td>0.75</td>
<td>0.462</td>
</tr>
<tr>
<td>Financial autonomy index</td>
<td>866</td>
<td>2789</td>
<td>49.04</td>
<td>49.11</td>
<td>0.844</td>
</tr>
<tr>
<td>Intention to save index</td>
<td>866</td>
<td>22797</td>
<td>48.19</td>
<td>48.29</td>
<td>0.772</td>
</tr>
</tbody>
</table>

Note: School characteristics are for 2008 and come from administrative data from the Federal Ministry of Education. Student characteristics were collected through the baseline survey conducted in August 2010. Financial knowledge and behavior indices are scaled to lie between 0 and 100. The last column displays the p-value, i.e. statistical significance level, of the difference in the treatment and control group mean for each variable. Stars denote the following statistical significant levels: *** 1 percent, ** 5 percent, * 10 percent.

### 6.1 Take-Up and Process Evaluation

Following school assignment to treatment and control, the program distributed textbooks to treatment schools and organized training sessions for the teachers. The vast majority of treatment schools received the financial education textbooks and distributed them to students. In both rounds of the follow-up survey, we asked school principals as well as teachers and students a series of questions regarding implementation and usage of the financial education...
program. Follow-up 1 spans the first semester of the program, while follow-up 2 covers the second and third semesters.

Table 4 shows that over 95 percent of treatment school principals report that they received the textbooks for the first semester, and 93 percent report receiving them for semesters 2 and/or 3. The large majority of teachers also say that students received the textbooks (i.e. the books were actually distributed to students), 94 percent and 92 percent in follow-up 1 and 2, respectively. On training, 78 percent of teachers report that they received training on how to use the financial education material in the first semester, and 65 percent report receiving it in the second/third semesters.

<table>
<thead>
<tr>
<th></th>
<th>Follow-up 1</th>
<th>Follow-up 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle: School received financial education textbooks</td>
<td>0.955</td>
<td>0.927</td>
</tr>
<tr>
<td>Teacher: Students received financial education textbook</td>
<td>0.938</td>
<td>0.921</td>
</tr>
<tr>
<td>Teacher: Received training</td>
<td>0.783</td>
<td>0.647</td>
</tr>
<tr>
<td>Student: Teacher used textbook in classroom</td>
<td>0.871</td>
<td>0.744</td>
</tr>
<tr>
<td>Principle: Financial education was taught in school</td>
<td>0.928</td>
<td>0.928</td>
</tr>
</tbody>
</table>

In terms of usage, 87 percent of students report that teachers actively used the financial education textbooks in classrooms in the first semester, though a drop-off occurs in semesters 2 and 3, with 74 percent of students reporting usage. However, the percentage of principals reporting that financial education was taught in school remained high throughout the study period (93 percent for all semesters).

Schools in the control group did not receive textbooks or teacher training through the financial education program studied in this paper. However, they may have implemented other types of financial education. The principal and teacher questionnaires were only applied in treatment schools during the first follow-up survey, but during the second follow-up survey control
schools also answered these questionnaires. In this survey, 16.6 percent of control group principals reported that the school had a financial education program and 11 percent of control group teachers reported receiving some training related to financial education. We do not have detailed information on the financial education program implemented in control schools. However, only 5 percent of control group principals reported that the school received a textbook with financial education material, suggesting that these programs may be less intensive than the one studied in this paper.

We supplemented this quantitative analysis with qualitative work in the form of teacher focus groups, which were organized with our Brazilian counterparts. The purpose of these meetings was to learn how teachers implemented the program, how material was integrated into the regular curriculum, and how the contents and/or delivery could be improved for future implementation.

Six such meetings were held in September and October 2011, with teachers and educators from all six states. All meetings were conducted in facilities provided by the State Education Departments and meals were provided. The meetings were generally well attended (more than 200 educators attended in São Paulo), and lasted an average of four hours each.

In all states, the teachers and educators greatly approved of the textbooks and the financial education program. They said that the material allowed students to learn by themselves, that student loved the case studies and felt that they connected well with their daily life situations. The teachers also complemented the clarity with which concepts were conveyed in the books. One teacher commented, “What motivates me the most about this project are the books. The content is directly related to students’ lives and helps to insert them in a highly-competitive market society. I learned a lot from the material, and similarly to what happened to my students, it has helped me to plan better for the future.”

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9 The student questionnaire did not include questions on program implementation in control group schools in either follow-up survey.
In terms of implementation, most teachers employed work group strategies to teach the material, where students were divided into small groups and asked to work on different tasks. Examples of such tasks varied from identifying steps for opening a small firm to creating a school market. Several teachers reported assigning projects to students related to fundraising and organizing their own graduation party. Other teachers reported undertaking field trips to local markets, universities, and companies to learn how they operate. Others used various forms of media to explore the topics in the textbook, such as computer simulations and videos.

While these qualitative responses are incredibly encouraging for the program, the teachers also reported some difficulties in implementation. For instance, some teachers expressed concerns at the lack of resources to complement the financial education textbooks. Many felt they did not have enough time to learn the material themselves before it was due to be taught to students. Some even felt they had to give up some core curriculum time so they could learn the materials through training.

Other concerns were more logistical. Teachers from all states felt that it was difficult to obtain timeline information about the project. Since the project delivery was decentralized, many teachers and educators reported not being able to identify a central resource for logistical inquiries. Similarly, some teachers said they were only told of the follow-up surveys a few days prior and had little time to accommodate the surveys in the class schedule. Finally, some teachers expressed concern about the continuity of the curriculum given the high turnover rate among students.

Overall, the teachers and educators felt the financial education program was valuable, that the textbooks were extremely relevant, and that they as well as their students enjoyed the new learning opportunities afforded to them.
6.2 Take-Up of Parents’ workshops

For the parents’ workshops, we asked schools to mail the filled-in parent exit questionnaires back to us after the workshop, and we determine which schools implemented the workshops based on our receipt of these questionnaires and on our random assignment. We received 1,553 filled-in parent questionnaires from 109 schools, implying that parents’ workshops did not take place in the other 153 schools (the school did either not organize the workshop or parents did not attend the workshop). When planning the parent intervention, our counterparts had cautioned that attendance rates may be low since parents of public high school students in Brazil tend to not participate in school events.

Comparing the lists of current students we received from schools before the workshop to the filled-in exit questionnaires gives an average attendance rate of 46 percent across the 109 schools that returned questionnaires. The attendance rate does not differ across parents who were randomized into the treatment and control groups. Parents did not know whether they had been assigned to watch a financial education or health video until the video was screened at the workshop. That is, the decision to attend was independent from treatment status. Hence, in our impact analysis of the parents’ workshop, we only keep students and parents if the parent attended a workshop. The interpretation of the results is applicable to families who in general are more interested in school events and respond to school invitations.

7. Results and Discussion

Based on the random assignment, the impact of the program is measured as the difference in average outcomes in the treatment and control groups. The results presented in figures below are statistically significant at the 1 percent level (unless otherwise stated) with standard errors clustered at the school level. Appendix 1 presents full regression tables. We include school pair dummies in all specifications and control for baseline values of available dependent variables, as per Bruhn and McKenzie (2009) and McKenzie (2011). When baseline values have missing observations, we replace these with zero and include a dummy variable indicating that the
observation was missing. Finally, note that results from the first and second follow-up surveys are not fully comparable due to changes in class composition from one year to the next.

### 7.1 Student Financial Proficiency

The impact of the financial education program on students’ financial proficiency is economically and statistically significant. Test scores indicate that the average level of financial proficiency is significantly higher in the treatment group than in the control group in both follow-up 1 and in follow-up 2, as shown in Figure 1. The difference is of 4 points and 3 points, respectively, or a 5 to 7 percent increase in financial knowledge. This is equivalent to a quarter of a standard deviation increase, which is a substantial effect size.

![Figure 1. Impact on Student Financial Proficiency](image)

To account for the parents’ workshops that were held prior to follow-up 2, we complement our analysis by running regressions with two independent treatment variables: the first indicating treated students and parents who were assigned to the financial literacy workshop, and the second indicating treated students and parents who were assigned to the health literacy workshop. These variables are compared to the control group in the regression analysis, and the coefficients remain statistically significant for both treatments. The F-tests for differences in coefficients between the two treatments are not significant for our outcomes of interest (except one parent financial literacy question).

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10 To account for the parents’ workshops that were held prior to follow-up 2, we complement our analysis by running regressions with two independent treatment variables: the first indicating treated students and parents who were assigned to the financial literacy workshop, and the second indicating treated students and parents who were assigned to the health literacy workshop. These variables are compared to the control group in the regression analysis, and the coefficients remain statistically significant for both treatments. The F-tests for differences in coefficients between the two treatments are not significant for our outcomes of interest (except one parent financial literacy question).
Further, test scores improve across the distribution benefiting low and high achieving students. Specifically, the proportion of students that perform exceptionally well increases by 28 percent and that of students performing exceptionally poor decreases by 26 percent. This effect represents a rightward shift in the distribution of test scores for treated schools compared to control schools, as shown in Figure 2. Hence, the financial education program helps poorly performing students to improve significantly, and well performing students to do even better. These distributional effects are important and show that the program benefited students along a broad performance spectrum rather than being driven by any one category, and that the curriculum speaks to the learning needs and interests of all types of students.
Next, we investigate savings and spending behavior and identify significant improvements in both. Note first that in our sample almost two-thirds of students had some type of income and about 38 to 42 percent were in the labor market. Hence, these students faced decisions on how much to save and what to spend their money on, whether to make a monthly list of expenses and whether to negotiate price and/or payment method when making a purchase. Their choices offer key insights into the spending behavior of youth whose purchases of cell phones, clothes, and fashion accessories may be driven by factors other than financial planning and foresight.

The analysis indicates strong treatment effects on all these dimensions. Specifically, students in the treatment group increase savings and exhibit significantly improved spending behavior relative to the control group. A higher proportion of students in the treatment group saved at least some of their income (49 percent in treatment compared to 44 percent in control at
follow-up 1; and 46 percent in treatment compared to 40 percent in control at follow-up 2). Not only does the proportion of students saving increase, but the actual saving amounts per student increase significantly also, by 1.4 percentage points in follow-up 2 (14.3 percent of income saved in the treatment group as compared to 12.9 percent of income saved in the control group).\textsuperscript{11} These results are shown in Figures 3 and 4 below.

![PERCENTAGE OF STUDENTS WHO SAVE](image)

**Figure 3: Impact on Percentage of Students Who Save More than Zero**

\textsuperscript{11} This question was not asked in follow-up 1.
We find significant treatment effects on spending behavior as well. The results show that 16 percent of students in treatment schools make a list of monthly expenses as part of a budgeting exercise compared to 13 percent in the control group in follow-up 1. These numbers are 17 percent and 14 percent respectively, in follow-up 2, as shown in Figure 5 below.
Additionally, a higher percentage of students in the treatment group say that they often negotiate prices or payment methods when making a purchase (78 percent in treatment compared to 74 percent in control in follow-up 1; and 77 percent in treatment compared to 74 percent in control in follow-up 2). These results are plotted in Figure 6 below.

![Figure 6. Impact on Negotiating Prices and Payment Methods When Making a Purchase](image)

### 7.4 Student Financial Autonomy and Intention to Save

In addition to improvements in current savings and spending behavior, we identify positive treatment effects on forward looking indices of financial autonomy and intention to save. Specifically, the average financial autonomy score for students in the treatment group is 51 compared to 49 in the control group in follow-up 1; and 52 in the treatment group compared to 51 in the control group in follow-up 2. In addition, we find that students in the treatment group have a higher measured intentioned to save (51) than those in control group (49) at follow-up 1, and 53 compared to 51 in follow-up 2. These results are presented in Figures 7 and 8 below. Normalizing these effect sizes, they range from 8 percent to 12 percent of a standard deviation.
Figure 7: Impact on Financial Autonomy

Figure 8: Impact on Intention to Save
7.5 Student Participation in Household Finance

Finally, we investigate whether financial education has any impact on students’ current participation in household finances using data collected through the parent questionnaires described in Section 5.

We find that a significantly larger percentage of students in the treatment group talk to their parents about finances and participate in organizing the household budget. First, Figure 9 below shows that 71 percent of students in treatment schools participate in household financial decisions compared to 67 percent in control schools in follow-up 1, and 74 percent compared to 70 percent in follow-up 2.

![Figure 9. Impact on Student Participation in Household Finances](image)

Figure 8 below shows similar positive treatment effects for students helping organize household budgets.
Overall, we find strong and statistically significant evidence that the financial education program was effective in improving financial knowledge, current and future financial behavior, as well as participation in household finances and budgeting.

7.6 Impact of Student Intervention on Parent Outcomes

Because the student financial education program included take-home exercises, such as making a budget that required the participation of parents, we examine whether the program has any trickle-up effects on parents’ financial knowledge and behavior.

Our results show no impact of the student financial education on parents’ financial knowledge in follow-up 1. Financial knowledge is measured through two standard questions on inflation and interest rates. However, in follow-up 2, parents of treatment school students are significantly more likely to correctly answer these questions than parents of students in control schools (see tables Appendix Table 5). These effects are statistically significant at the ten percent level. In follow-up 2 we also detect a positive and statistically significant difference in financial knowledge of budgeting between the two groups: Compared to 68 percent of parents in the control group, parents of students in the treated schools are 6.3 percent more likely to
understand the composition of a budget. This is a promising result as budgeting was keenly taught in the student curriculum, including a take-home exercise where students were asked to make a household budget in consultation with their parents.

When examining the impact of the student financial education on parent’s financial behavior, we detect no effects in follow-up 1, but again see several positive impacts in follow-up 2. The percentage of parents who save more than zero increases from 76 percent in control schools to 78 percent in treatment schools. The average percentage of income saved increases from 12 percent in control schools to close to 13 percent in treatment schools. Both of these effects are statistically significant at the five percent level. Parents in student treatment schools are also more likely to list monthly expenses in a budget, with an increase from 37 percent of parents in the control schools to 39 percent of parents in the treatment schools.

These results indicate that the student financial education has a significant “trickle-up” impact or spillovers to parents. The next section discusses whether the parents’ workshop reinforced this effect.

7.7 Impact of Parents’ Workshops
Some parents of treatment school students participated in a financial education workshop that took place between the first and second follow-up surveys. This workshop was designed to raise awareness among parents about the importance of financial education and to encourage them to interact more with their children on financial matters, thereby leveraging and reinforcing the material students were taught through the program. 109 treatment schools volunteered to hold a parents’ workshop and 46 percent of parents in these schools attended. These parents were randomly divided into two groups: a treatment group that watched a financial literacy video on the benefits of savings and budgeting. The control group watched a health video on the benefits of adopting preventative measures for a number of diseases.
To measure the impact of the parent workshop, we compare outcomes of parents who attended and also the outcomes of their children across the groups that watched the financial literacy video and the health video. We only include parents who actually attended a workshop in this analysis, excluding parents in the same schools who were invited, but did not come to the workshop. Parents who went to the workshop have different baseline characteristics from the ones who did not attend. They are more likely to be recipients of the Bolsa Familia cash transfer program and fathers are less likely to have completed at least some secondary education, suggesting that they are from relatively more disadvantaged households. Drop-out rates are also higher in schools that held a parent workshop. These differences imply that the parent workshop results are not representative of the full sample, although they are valid for the group of parents who attended a workshop (and the corresponding students).

We find no significant improvements in parents’ financial behavior as a result of watching the financial literacy video – parents who watched this video are no more likely to make a budget or improve savings behavior compared to those who watched the health video.

The lack of significant impact of the parents’ workshop may be due to the relatively low intensity of the treatment or other constraints parents face in responding to the information. The exposure to financial education material through the DVD was relatively short and the workshops included no supplementary discussions. This is consistent with the existing literature on financial education (see for example, Cole, Sampson, and Zia, 2011).

The remarkable result from this intervention, however, is the impact of the parents’ workshop on student behavior. The parents’ workshops significantly increase the savings rate among students by 2.5 percentage points. Specifically, students whose parents participate in the health literacy workshops save on average 13.5 percent of their income. In comparison, students whose parent participate in the financial literacy workshops save 16 percent of their income. This difference is statistically significant at the five percent level. Hence, parents are able to use their improved knowledge to reinforce the school messages with their children.
8. Impact of the Study

The findings of this study are being used to guide policy discussions on the impact of financial education in schools. The audience includes financial institutions and education sectors in Brazil and several other interested countries. In fact, the Ministry of Education in Brazil has recently approved a continuation of the financial education program, which will now extend to 5,000 public high schools in the country. Several other countries in the region have expressed interest in the Brazilian experience to learn and adapt the program to their respective environments and schools systems.

As an initial indicator of policy impact, the results of the study were widely covered in the national media of Brazil – in newspapers, radio and television. Journalists from the largest new outlets in the country, such as O Globo, Valor Econômico, Folha de São Paulo and Agência Estado reported on the potential of such a program on improving national savings behavior.

A simple back of the envelope calculation on economy wide impacts of our intervention complements this positive press coverage. We start by assuming that the 1 percentage point increase in the savings rate is channeled into domestic investment (note that we ignore compounding over the years). Brazil’s current investment stands at 18 percent of GDP and it supports an economic growth rate of 3.5 percent on average. Dividing the investment share of GDP by the economic growth rate results in an incremental capital-output ratio of 5.14. Hence, a 1 percentage point increase in savings and investment would yield a 1/5 percentage point increase in GDP. With a $2 trillion economy, this results in a $4 billion annual increase – a substantial amount. Clearly, this is a simple calculation and does not account for several macro factors and an even larger evaluation and macro-simulation would make this estimation stronger, however the ballpark improvement in the economy is substantial and definitely outweighs the entire cost associated with the intervention several times over.
Another way to assess the impact of our study is to compare it to similar studies in the literature. Unfortunately, the literature that studies financial education in schools is extremely small, and many of the existing studies are fraught with identification concerns as discussed in Section 2.1 of this paper. But there are school based studies outside the realm of financial education that are important for comparison purposes. The type of education interventions in secondary schools that have been tested through random control trials include the provision of school resources, monetary incentives to students, and student tutoring. In general, these studies identify improvements in student learning during the periods studied, although some studies do not find the effects to be statistically significant.

Perhaps the most comparable study to ours is one in Brazil that provides financial resources and access to technology to Brazilian high schools – Projeto Jovem de Futuro. Using a randomized control trial methodology, the study finds improvements in test scores in Portuguese by 34 percent and in Math by 55 percent. These are substantial effect sizes, but in standard deviation terms, these effects are not very large. Another randomized evaluation of computers for education in Colombia among 97 school and 5,201 students finds improvements of 0.017 standard deviations in Spanish and 0.008 standard deviations in Math (Barrera-Osorio and Linden, 2009). Providing monetary incentives to students tends to improve test scores, also. Perhaps the most well-known studies in this area are Angrist and Lavy (2009) and Angrist et. al. (2002). In the first study, Israeli students are provided cash incentives to pass their graduation exams, and while the mean estimates are positive they are not statistically significant. In the second study, lotteries are used in Columbia to distribute vouchers to partially cover the cost of private secondary schooling for 1,600 students who maintain satisfactory academic progress. Three years after the lotteries, winners are about 10 percentage points more likely to have finished 8th grade, and score 0.2 standard deviations higher on achievement tests, although the latter result is only marginally significant. Finally, direct tutoring is beneficial in improving test scores too – a randomized evaluation in Chile finds that providing a 3-month program of small group tutoring to fourth graders using college student
volunteers increases reading performance by 0.15-0.2 standard deviations (Cabezas et. al., 2011).

Compared against this literature, our finding of an improvement of 0.2-0.24 standard deviations in financial proficiency lies in the very top end of statistically significant improvements in test scores.

9. Conclusion
This paper makes an important contribution to the literature by demonstrating that a financial education program targeted to youth can both increase knowledge, and improve attitudes and behavior. We believe this is the due to two factors, one, the quality and intensity of the program and, two, the quality, scope and scale of the study.

Brazil embarked on an extraordinary experience with financial education that has attracted national and international attention for its scope, innovation, and results. The ambition is to move policy practice from small targeted interventions to a multi-arm program to improve the inter-temporal decisions and economic outcomes of a whole nation. Innovation in design is a central element of this program, with a coalition of financial institutions working with the best educators to develop creative and interactive didactical tools to transform the way young people think about their life choices. The early results are impressive: the approach is effective in improving what high-school students know, their current savings and spending behavior, and their attitudes towards investing in their future. Furthermore, educating parents further improves impact on students.

The early lessons from this experience are important for Brazil and for the rest of the world. First, increasing knowledge may lower the demands on cognitive resources and help reduce anomalies in inter-temporal choice. Second, financial education can be understood more widely as the life skills needed for making better inter-temporal decisions, being aware of opportunities ahead and planning to take advantage of them. As such, financial education can
strengthen the effectiveness of policies aimed at economic growth and poverty reduction. Third, the partnership between the highly educated and resourceful facets of Brazil's financial and private sectors with the less resourced education system can play a transformative role in making public schools an exciting place for learning and personal growth, and improving the prospects for equality of opportunity for all. Fourth, educating parents can strengthen their involvement in their children's education and generate powerful dynamics within the household. Adult education is thus an important element in children's education and poverty reduction. Finally, once brought to scale, this program has the potential to improve national saving rates and, potentially, the rate of economic growth.
References


Lührmann, Melanie, Marta Serra-Garcia, and Joachim Winter. 2012. "The effects of financial literacy training: Evidence from a field experiment with German high-school
children.” Discussion Papers in Economics 14101, University of Munich, Department of Economics.


### APPENDIX 1: Regression Tables

#### APPENDIX TABLE 1: IMPACT ON STUDENT FINANCIAL PROFICIENCY

<table>
<thead>
<tr>
<th>Financial Proficiency Score</th>
<th>Follow-up 1</th>
<th>Follow-up 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>Student Treatment</td>
<td>3.548***</td>
<td>3.020***</td>
</tr>
<tr>
<td></td>
<td>(0.296)</td>
<td>(0.355)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.455</td>
<td>0.328</td>
</tr>
<tr>
<td>N</td>
<td>17831</td>
<td>18415</td>
</tr>
<tr>
<td>Number of Clusters</td>
<td>829</td>
<td>824</td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>56.135</td>
<td>59.003</td>
</tr>
<tr>
<td>Dependent Variable SD in Control Group</td>
<td>14.804</td>
<td>14.908</td>
</tr>
</tbody>
</table>

Columns (1) and (2) use data from follow-up waves 1 and 2, respectively. The number of students and schools included in the sample fluctuate within a wave because not all students answered every question; and they fluctuate across waves because of student turnover across the school years. The outcome variable in this table is a student financial proficiency score, which aggregates financial knowledge questions included in the surveys. All regressions control for baseline outcomes and include school pair dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors, clustered at the school level, are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
## APPENDIX TABLE 2: IMPACT ON STUDENT SAVINGS AND SPENDING BEHAVIOR

<table>
<thead>
<tr>
<th></th>
<th>Saves More than Zero</th>
<th>Percentage of Income Saved</th>
<th>List Monthly Expenses in a Budget?</th>
<th>Negotiate Prices or Payment Methods?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Follow-up 1</td>
<td>Follow-up 2</td>
<td>Follow-up 1</td>
<td>Follow-up 2</td>
</tr>
<tr>
<td>Student Treatment</td>
<td>0.047***</td>
<td>0.052***</td>
<td>N/A</td>
<td>1.389***</td>
</tr>
<tr>
<td>(0.006)</td>
<td>(0.007)</td>
<td>(0.316)</td>
<td>(0.005)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.210</td>
<td>0.106</td>
<td>0.045</td>
<td>0.149</td>
</tr>
<tr>
<td>N</td>
<td>16288</td>
<td>17320</td>
<td>16695</td>
<td>16358</td>
</tr>
<tr>
<td>Number of Clusters</td>
<td>825</td>
<td>822</td>
<td>822</td>
<td>825</td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>0.440</td>
<td>0.404</td>
<td>12.897</td>
<td>0.129</td>
</tr>
<tr>
<td>Dependent Variable SD in Control Group</td>
<td>18.958</td>
<td>18.958</td>
<td>18.958</td>
<td>18.958</td>
</tr>
</tbody>
</table>

Odd and even numbered columns use data from follow-up waves 1 and 2, respectively. The number of students and schools included in the sample fluctuate within a wave because not all students answered every question; and they fluctuate across waves because of student turnover across school years. The outcome variables in this table are: an indicator variable equal to 1 if the student saves a positive fraction of income; the actual percentage of student monthly income that is saved; an indicator variable equal to 1 if the student makes a list of all monthly expenses; and an indicator variable equal to 1 if the student negotiates either the price or the payment method when making purchases. All regressions control for baseline outcomes and include school pair dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors, clustered at the school level, are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
### APPENDIX TABLE 3: IMPACT ON STUDENT ATTITUDES AND FUTURE BEHAVIOR

<table>
<thead>
<tr>
<th></th>
<th>Financial Autonomy Index</th>
<th>Intention to Save Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Follow-up 1 (1)</td>
<td>Follow-up 2 (2)</td>
</tr>
<tr>
<td>Student Treatment</td>
<td>1.703***</td>
<td>1.774***</td>
</tr>
<tr>
<td></td>
<td>(0.234)</td>
<td>(0.305)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.449</td>
<td>0.250</td>
</tr>
<tr>
<td>N</td>
<td>14283</td>
<td>16019</td>
</tr>
<tr>
<td>Number of Clusters</td>
<td>824</td>
<td>822</td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>49.035</td>
<td>50.544</td>
</tr>
</tbody>
</table>

Odd and even numbered columns use data from follow-up waves 1 and 2, respectively. The number of students and schools included in the sample fluctuate within a wave because not all students answered every question; and they fluctuate across waves because of student turnover across school years. The outcome variables in this table are a student financial autonomy index and an intention to save index. The financial autonomy index aggregates responses to questions that elicit future financial preferences, confidence, and decision making independence. The intention to save index aggregates responses to questions on future hypothetical savings and spending scenarios. All regressions control for baseline outcomes and include school pair dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors, clustered at the school level, are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
APPENDIX TABLE 4: IMPACT ON STUDENT PARTICIPATION IN HOUSEHOLD FINANCE

<table>
<thead>
<tr>
<th></th>
<th>Student Discusses Financial Matters with Parents?</th>
<th>Student Helps Organize Household Budget?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Follow-up 1 (1)</td>
<td>Follow-up 2 (2)</td>
</tr>
<tr>
<td>Student Treatment</td>
<td>0.036*** (0.007)</td>
<td>0.039*** (0.006)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.171</td>
<td>0.104</td>
</tr>
<tr>
<td>N</td>
<td>13357</td>
<td>13844</td>
</tr>
<tr>
<td>Number of Clusters</td>
<td>810</td>
<td>816</td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>0.673</td>
<td>0.701</td>
</tr>
</tbody>
</table>

Odd and even numbered columns use data from follow-up waves 1 and 2, respectively. The number of students and schools included in the sample fluctuate within a wave because not all students answered every question; and they fluctuate across waves because of student turnover across school years. The outcome variables in this table are: an indicator variable equal to 1 if a student discusses financial matters at home; and an indicator variable equal to 1 if a student helps organize the household budget. Both questions are based on responses to the parent questionnaires. All regressions control for baseline outcomes and include school pair dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors, clustered at the school level, are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
APPENDIX TABLE 5: TRICKLE UP IMPACT ON PARENT FINANCIAL KNOWLEDGE

<table>
<thead>
<tr>
<th></th>
<th>Correctly Answered Interest Rate Question</th>
<th>Correctly Answered Inflation Question</th>
<th>Knows What Goes into a Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Follow-up 1 (1)</td>
<td>Follow-up 2 (2)</td>
<td>Follow-up 1 (3)</td>
</tr>
<tr>
<td>Student Treatment</td>
<td>-0.001</td>
<td>0.017*</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.009)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.091</td>
<td>0.071</td>
<td>0.132</td>
</tr>
<tr>
<td>N</td>
<td>13368</td>
<td>12691</td>
<td>13327</td>
</tr>
<tr>
<td>Number of Clusters</td>
<td>809</td>
<td>816</td>
<td>809</td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>0.444</td>
<td>0.443</td>
<td>0.329</td>
</tr>
</tbody>
</table>

Odd and even numbered columns use data from follow-up waves 1 and 2, respectively. The number of students and schools included in the sample fluctuate within a wave because not all students answered every question; and they fluctuate across waves because of student turnover across school years. The outcome variables in this table are three financial literacy questions in the parent surveys: the interest rate question tests the ability to calculate an interest rate using percentages; the inflation question tests the understanding of how inflation affects future purchasing power; and the budgeting question tests the knowledge of what goes into a budget. All regressions control for baseline outcomes and include school pair dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors, clustered at the school level, are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
## APPENDIX TABLE 6: TRICKLE UP IMPACT ON PARENT SAVINGS AND SPENDING BEHAVIOR

<table>
<thead>
<tr>
<th>Has Formal Savings?</th>
<th>Percentage of Income Saved</th>
<th>Lists Monthly Expenses in a Budget?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up 1 (1)</td>
<td>Follow-up 2 (2)</td>
<td>Follow-up 1 (3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow-up 2 (4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow-up 1 (5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow-up 2 (6)</td>
</tr>
<tr>
<td>Student Treatment</td>
<td>0.003</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>0.667**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.021***</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.334</td>
<td>0.206</td>
</tr>
<tr>
<td></td>
<td>(0.263)</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.190</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.116</td>
</tr>
<tr>
<td>N</td>
<td>13079</td>
<td>13533</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12953</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13187</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13566</td>
</tr>
<tr>
<td>Number of Clusters</td>
<td>810</td>
<td>816</td>
</tr>
<tr>
<td></td>
<td></td>
<td>816</td>
</tr>
<tr>
<td></td>
<td></td>
<td>810</td>
</tr>
<tr>
<td></td>
<td></td>
<td>816</td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>0.734</td>
<td>0.762</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.171</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.366</td>
</tr>
<tr>
<td>Dependent Variable SD in Control Group</td>
<td></td>
<td>16.521</td>
</tr>
</tbody>
</table>

Odd and even numbered columns use data from follow-up waves 1 and 2, respectively. The number of students and schools included in the sample fluctuate within a wave because not all students answered every question; and they fluctuate across waves because of student turnover across school years. The outcome variables in this table are based on responses in the parent survey and include: an indicator variable equal to 1 if the parent has formal savings such as a current account, savings account, debit card or checks; the actual fraction of monthly income that is saved; and an indicator variable equal to 1 if the parent makes a list of monthly expenses in a budget. All regressions control for baseline outcomes and include school pair dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors, clustered at the school level, are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
## APPENDIX TABLE 7: IMPACT OF PARENT FINANCIAL EDUCATION WORKSHOP

<table>
<thead>
<tr>
<th>Parent</th>
<th>Student</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knows What Goes into a Budget</td>
<td>Has Formal Savings?</td>
<td>Percentage of Income Saved</td>
<td>Lists Monthly Expenses in a Budget?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attended FinLit Workshop</td>
<td>-0.042</td>
<td>0.018</td>
<td>1.350</td>
<td>0.008</td>
<td>0.024</td>
<td>2.445**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.026)</td>
<td>(1.057)</td>
<td>(0.030)</td>
<td>(0.027)</td>
<td>(1.135)</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.197</td>
<td>0.375</td>
<td>0.202</td>
<td>0.254</td>
<td>0.253</td>
<td>0.170</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1022</td>
<td>1059</td>
<td>1016</td>
<td>1063</td>
<td>1273</td>
<td>1239</td>
<td></td>
</tr>
<tr>
<td>Dependent Variable Mean in Control Group</td>
<td>0.824</td>
<td>0.705</td>
<td>12.550</td>
<td>0.376</td>
<td>0.474</td>
<td>13.484</td>
<td></td>
</tr>
<tr>
<td>Dependent Variable SD in Control Group</td>
<td>14.838</td>
<td>17.567</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The sample includes parents in treatment schools who attended either a financial education or health education workshop. Since workshop assignment was not revealed in advance, the analysis only includes parents who attended; all parents who were invited but did not attend are excluded. Data in this table is from follow-up survey 2 since the parent workshops occurred between the two follow-up survey waves. Four parent outcomes are presented in this table: a budgeting question that tests the knowledge of a budget; an indicator variable equal to 1 if the parent has formal savings such as a current account, savings account, debit card or checks; the actual fraction of monthly income that is saved; and an indicator variable equal to 1 if the parent makes a list of all monthly expenses. In addition, two student outcomes are presented: an indicator variable equal to 1 if the student has any savings; and the actual fraction of monthly income that is saved. All regressions control for baseline outcomes and include parent workshop stratification dummies. When baseline outcomes have a missing value, they are replaced by zero and a dummy variable indicating such missing values is included. Robust standard errors are in parentheses. Statistical significance levels: *10 percent, **5 percent, ***1 percent.
APPENDIX 2: Details of the Financial Education Curriculum

A1.1 General Description

The material provided to teachers and used in the school financial education program in Brazil includes: (i) a student textbook, (ii) a student exercise book, (iii) a teacher guidebook, and (iv) a teacher training DVD. This material was developed by the Pedagogical Support Group (GAP: Grupo de Apoio Pedagógico). This Appendix describes the content of the student textbook in detail.12

The student textbook is divided into three blocks and covers nine different themes. Each theme is taught through case studies/didactic situations (SDs), consisting of theoretical and applied content, activities and self-evaluative questions. SDs make use of texts, stories, images, and tables to convey the material in an accessible way. SDs also contain “experiment” sections that are designed to make the material relevant to students’ daily life. SDs conclude with a short outline of what is expected from the student in terms of learning.

The rest of this Appendix describes each of these blocks and the inclusive themes.

A1.2 Block 1

The first block discusses three themes: everyday family life, social life, and personal property.

THEME 1: EVERYDAY FAMILY LIFE

In everyday family life, students are exposed to common situations where they have to make decisions that impact their family’s financial wellbeing. This theme is covered in 7 sections, which are described below:

12 The student exercise books and the teacher guidebooks and DVDs were meant to support the material covered in the student textbooks and did not offer new material of their own. The student exercise book provided assignments to students based on material taught through the textbook. Similarly, the teacher guidebook and DVD provided instructions on teaching and assessment methods for the course material, as well as examples of how to integrate the financial education curriculum into regular school learning.
1. Agenda and Planning
   → Record expenses regularly
   → Know where you spend money
   → Estimate the value of items purchased

2. Calendar
   → Make a list of personal and family expenses
   → Classify expenses as “fixed” or “variable”
   → Prepare a monthly budget separating “fixed” and “variable” expenses

3. House Repairs
   → Compare different repair cost estimates
   → Compare interest rates for personal loans
   → Decide whether to take a loan or use money previously saved

4. Supermarket
   → How to avoid overspending on “temptation” good
   → To distinguish good and bad behaviors when going shopping
   → Advance decision making on items to purchase

5. Balancing
   → Distinguish and categorize personal and family expenses
   → Assess the importance of these different expenses
   → Identify spending categories where cuts can be made
   → Prepare a 5% spending-cut plan

6. Unforeseen Circumstances
   → Understand the value of insurance
   → Understand the specific vocabulary of insurance products
   → Identify alternative methods of prevention

7. Matching spending to earnings
   → Classify income sources as “fixed” and “variable”
   → Prepare a table with family incomes
   → Analyze how family spends and saves money
THEME 2: SOCIAL LIFE

In social life, students are exposed to situations where they have to make financial decisions about their personal and social lives. This theme is covered in 7 sections, discussed below:

1. What a waste
   → Analyze personal expenses and identify waste
   → Avoid waste
   → Identify actions that can lead you to spend more than necessary

2. Let’s get this party started
   → Make estimates of the quantity of food and drinks necessary for a party
   → Make a budget for a party
   → Plan an environmentally friendly party
   → Identify pitfalls when making estimates

3. To give in or not to give in to peer pressure… that is the question
   → Organize financial information in a way that can be easily explained to others
   → Learn and apply concepts such as interest rate, risk and return to everyday situations

4. Buying on credit
   → Identify elements of a credit card bill
   → Identify financial behaviors that lead to credit card debt
   → How to use a credit card in a responsible manner

5. Camping
   → Identify expenses involved in camping
   → Always keep funds for unforeseen events
   → Prepare a financial plan to go camping

6. “Viva São Joao!”
   → Prepare a plan for a special festivity in terms of a business plan

7. Don’t fall victim to advertising
   → Identify financial pitfalls of credit card advertisements
Analyze various options available for credit

THEME 3: PERSONAL PROPERTY

In personal property, students learn from situations where they have to make personal shopping decisions. This theme is covered in 7 sections, discussed below:

1. In search of the perfect shoes
   → Calculate the difference between the price paid in cash and the one paid with credit
   → Decide if it is better to pay in cash or with credit
   → Find specific information in the Consumer Defense Code

2. Computer
   → Identify the opportunity cost of owning a computer
   → Balance wants and needs when choosing a computer
   → Compare prices
   → Calculate the necessary savings in order to buy a computer

3. Digital camera
   → Follow similar steps as with purchasing a computer

4. If by magic...
   → Identify the elements of advertising aimed at generating consuming desire
   → Identify the conflict between desires and needs
   → Be vary of temptation traps and impulsive spending

5. Cell phone
   → Choose a cell phone that best fit your needs
   → Choose a plan that best fits your needs
   → Understand your cell phone bill

6. Consumer protection measures?
   → Identify cases of abusive practices and consumer rights violations
   → When to reach out to the Foundation for the Protection and Consumer Advocacy (PROCON)

7. Changing money
→ Convert the value of products priced in foreign currency to local currency
→ Know how the value of a credit card purchase in foreign currency appears in local currency on the bill

A1.3 Block 2
The second block discusses three themes: work, entrepreneurship, and large projects.

THEME 4: WORK
In work, students discuss several aspects of their current and future professional lives. This theme is covered in 7 sections, discussed below:
1. What line of work?
   → Identify the type of work that attracts you the most
   → Decide on the most appealing type of job according to your life ambitions
2. First job
   → Prepare a CV
   → Identify the skills that are compatible with advertised positions
   → Appropriately highlight your professional qualities in a simulated job interview
   → Combine your desired job with the type of life you want to have
3. Gross vs Net income
   → Differentiate gross and net income
   → How to explain this concept to others
4. Good times and bad times
   → Understand the concept of structural unemployment in a made up story
   → Identify measures to overcome unemployment
5. The incredible case of the 13\textsuperscript{th} salary that disappeared
   → Make a budget based on data and estimates
   → Make a simulated financial plan in order to achieve a positive balance at the end of the month
   → Consider future situations in the current monthly planning
6. Lifelines
   → Prepare an outline of a retirement plan, harmonizing long-term goals and the means to achieve them

7. Antenor, the wary employee
   → Develop a product and the message for an information campaign about insurance
   → Utilize the vocabulary of insurance as it applies to an information campaign

THEME 5: ENTREPRENEURSHIP
In entrepreneurship, students learn about practical issues of creating and running a business.
This theme is covered in 7 sections, and discussed below:
1. A great idea
   → Differentiate entrepreneurs driven by necessity and by opportunity
   → Relate own characteristics with business opportunities
   → Identify needs in own community that may generate a business opportunity
   → Brainstorm to generate good business ideas

2. What are your talents?
   → Distinguish between “knowledge”, “skill”, “attitude”, and “competencies” in an the context of entrepreneurship
   → Evaluate if you possess the necessary knowledge to open a particular business
   → Evaluate if you possess the necessary skills to open a particular business
   → Evaluate if you possess the necessary attitudes to open a particular business

3. Profession: entrepreneur
   → Identify the characteristics of an entrepreneur
   → Differentiate entrepreneurship from intrapreneurship
   → Test if you have the profile of an entrepreneur

4. The soul of a business
   → Identify the target audience of a fictitious business
   → Create a brand and slogan for a fictitious product or service
   → Put together a fictitious marketing plan
→ Carry out market research for a fictitious product or service

5. Hands to work
   → Identify resources necessary to open and run a business
   → Budget for opening and running a fictitious business
   → Determine the knowledge, skills, attitudes, and competencies of the personnel necessary to work in a fictitious business

6. Victory
   → Make sales and profit projections for a fictitious business
   → Measure the profit of a fictitious business
   → Cut costs and expenses related to products or services of a fictitious business

7. Beyond profit
   → Distinguish between philanthropy and socio-environmental responsibility
   → Make a plan of socio-environmental responsibility for a fictitious business
   → Put together in a business plan all the information on entrepreneurship learned in this theme

THEME 6: LARGE EXPENDITURES

In large projects, students are exposed to situations that involve significant financial outlays. This theme is covered in 7 sections, and discussed below:

1. Brick by brick
   → Balance the desires and needs of your family when choosing a house to purchase
   → Search for information on prices and financing for a house
   → Decide how much your family is willing to spend as a function of the household budget
   → Plan financially for the down payment and installments of a home mortgage

2. Surprise
   → Create a budget for a party
   → Plan a party that suits your financial situation
   → Make provisions for unforeseen expenses
   → Cut expenses according to your priorities
3. In your corner
   → Make investment decisions in a simulated market situation
   → Make an initial investment decision, taking into consideration family and personal preferences
4. She speaks about the same thing all day long
   → Identify rights and duties that are not being met in a certain situation
   → Generate arguments to debate rights and duties of investors
5. Consumption and savings
   → Make consumption and savings decisions in a simulated situation
6. Now it’s my turn to help my parents
   → Decide between two debt application options, taking into account interest rates
   → Explain how to avoid indebtedness
   → Come up with options to pay off a debt of R$ 1000 (US$ 583)
7. How much distance separates you from your future
   → Estimate fixed and variable expenses in order to study in another city
   → Calculate the monthly income necessary to study in another city
   → Make a financial plan to study in another city

**A1.4 Block 3**
The third block discusses three themes: public goods, the country’s economy, and the world economy.

**THEME 7: PUBLIC GOODS**
In public goods, students address several issues concerning the use and financing of public goods and services. This theme is covered in 7 sections, discussed below:

1. Everything has a price
   → It is always the case that someone pays for the public goods you consume for free
   → Calculate how much the government spends to sustain a high school class in a public school
2. School budget
   → Think about the school and its budget
   → Suggest improvements to the school that are feasible

3. School books
   → Identify the reasons for high environmental cost of school books
   → Calculate the consumption of paper in school
   → Identify actions that can save paper
   → Develop and engage in a campaign to save paper

4. Public spaces
   → Everyone has the right to access free public spaces
   → Maintenance of public spaces is costly and is paid for through taxes
   → The individual tax burden can be reduced if all citizens pay their taxes
   → Consult the community in order to know which public spaces need to be improved

5. Public services
   → A public budget is very similar to a family budget
   → The legislature – senators and congressmen – decides the public budget
   → Link the public duty to pay taxes with the government’s duty to provide public services

6. Corruption
   → Corruption affects the lives of everyone because it reduces the money that the government can to invest in public services
   → Check public accounts through public records

7. Taxation
   → Link the public duty to pay taxes with the government’s duty to provide public goods and services
   → Understand the purpose of different taxes paid by citizens
   → Develop and engage in a campaign to provide incentives for citizens to pay their taxes
THEME 8: THE COUNTRY ECONOMY

In the country economy, students are exposed to several aspects of their country’s economy that are relevant for their personal lives, including the concept of inflation, the law of supply and demand, the concept of minimum wage, and the basics of the national financial system. This theme is covered in 7 sections, discussed below:

1. Culture and sports
   → Prepare an outline of a project for a cultural or sporting activity
   → Align the objectives of a project to the Rouanet Law (Law that provides tax incentives to private firms for supporting cultural activities)
   → Understand the sections of the laws concerning education that contain financial vocabulary

2. Inflation
   → Recognize the problems that inflation can generate when changes in income do not follow the increase in prices
   → Make adjustments in the family budget taking inflation into consideration
   → Explain the concept of inflation to someone else

3. Supervisors of the national financial system
   → Explain the national financial system to someone else

4. Speaking in economic terms
   → There exists a direct relationship between the nation’s economic growth and the growth of a family’s personal income
   → Families with low income can also organize themselves financially

5. Markets
   → Demand and supply simulations

6. Foresight
   → Estimate the income and expenses of a retired person
   → Prepare a simulated financial plan for a retired person

7. Minimum wage
   → Research prices to estimate the total value of the basic needs of a person
→ Link the value of the basic needs of a person with the value of the minimum wage

**THEME 9: THE WORLD ECONOMY**

In the world economy, students are exposed to several aspects of the world economy that are relevant for their personal lives, such as the concept of imports and exports, international economic blocks, and measures of a country’s wellbeing. This theme is covered in 7 sections, discussed below:

1. Special issue on money
   → Contextualize the role of money in society
   → The importance of saving money

2. International cooperation
   → Identify the complications involved in international negotiations
   → International economic blocks organize themselves through arrangements that are negotiated

3. The game of economic blocks
   → Experience, in a game, some of the issues concerning international economic blocks
   → Think about simulated strategies of global resolution of conflicts

4. The business of China
   → Identify the imported products that you use in my everyday life
   → Locate the countries from where the imported products you use in my everyday life come from
   → Search for data on national and international exports

5. International Organizations
   → Reflect upon the profile and the performance of representatives of a country in an international community
   → Develop a funding proposal for an international financial institution

6. The wellbeing of your country
   → Compare the Index of Human Development with the GDP per capita for different countries
→ Link the economic performance of a country with its environmental impact

7. Moment of crisis: do I care?

→ Establish the relationship between an economic crisis and situations of your personal life

→ Identify ways to overcome the impact of an economic crises for individuals