

DIME Financial and PSD Program in Brief



HOW EARLY ONE SHOULD START FINANCIAL EDUCATION? EVIDENCE FROM A LARGE SCALE EXPERIMENT

Introduction

Economists disagree on many things, but there is an universal consensus in the field that education is key for long-term growth and development. Evidence strongly suggests that what really matters for development is the quality of education (Hanushek and Woessmann 2010). Unfortunately, there doesn't seem to be an easy way to improve school quality. How can we ensure that students develop their reading, writing, and math skills from their very first days in school? This is a challenge that has led many countries to test interventions aimed at improving school quality. Hundreds of interventions have been tried and rigorously tested, but we are still far from having a good understanding of what policies are effective in enhancing school quality (Evans and Popova, 2015). While the development of reading, writing, and math skills are important, they also have implications on other fields such as financial literacy (Lusardi 2012).

A recent meta-analysis compiled 71 experimental evaluations from developing countries. The evaluations tested the impact of programs aimed at improving the quality of elementary schools (proxied by standardized test scores). Overall, the programs included in the meta-analysis showed very limited effects on learning outcomes (McEwan 2015).

The evidence suggests that improving school quality is difficult. The limited effects found by short-term interventions with completely new subjects—such as financial education—on learning outcomes should not be a surprise. To our knowledge, in addition to our study, there is only one experimental evaluation of a financial-education program that targeted elementary school students in a developing



country. The pilot program was conducted in Ghana for a full school year but had no effects on learning and attitudinal and behavioral outcomes (Berry et al. 2015).

Brazil's National Strategy of Financial Education (ENEF) piloted a program to strengthen basic financial-literacy skills in young elementary-school students. As with a similar successful program with high-school students, this new initiative tried to balance hard and soft (behavioral) skills. The pilot was drafted in 2015 and was divided into four modules: module 1 was structured for first to fourth graders, module 2 to fifth and sixth graders, module 3 to seventh and eighth graders, and module 4 to ninth graders. The modules had distinct content and approaches. They did not compete with regular content as new subjects, but were integrated into math or reading classes. Though different, the modules complemented each other as they focused on the same set of skills that must be built and deepened as students progress through the school cycle.

The starting assumption of this initiative is that financial aspects are already present in the daily lives of students, which is why financial education should be introduced early in life. The introduction of financial education should consider two dimensions: spatial and temporal. The spatial dimension takes into account how individual decisions can have social impacts, while the temporal dimension introduces students to the intertemporal dimension embedded in various decision making.

Design of the Evaluation and Data Collection

The curriculum was tested in a randomly-selected set of schools to evaluate the pilot. The pilot was implemented in 101 municipal schools in Joinville, a municipality located in the south, and Manaus, a municipality located in the north. Only the third, fifth, seventh, and ninth grades were included for the evaluation. The idea was to test the impact of each module separately. We selected 72 schools in Joinville and 129 in Manaus for the evaluation, and randomly assigned 36 and 75 schools respectively to receive the pilot. The other 100 schools randomized out were used as the control group. The selection of schools was based on a two-level stratification: city and type of school. Within each city, schools were divided according to the cycles they offered (only primary school, only middle school, and both). This division resulted in six strata.

Given the budget constraints, we skipped the baseline and allocated resources to a large-scale follow up at the end of

the 2015 school year. Administrative data from school census and a large-scale assessment test were used to select the sample of schools and check balance after randomization. Primary data was collected by CAEd (*Centro de Políticas Públicas e Avaliação da Educação*), a firm specialized in conducting educational surveys. Four different tools were used for data collection: a standardized exam was conducted in December 2015 to measure students' financial proficiency, an attitudinal and behavioral questionnaire, and a questionnaire to capture socio-demographic characteristics of students. Teachers responsible for the class (third and fifth grades) and for the financial-literacy curriculum answered a questionnaire as well.

The standardized exam included a block of questions aimed to measure skills built due to the training. In fact, the exam used the Item Response Theory (IRT) to measure the level of skills at different grades in a unique scale comparable among grades.

Implementation

The pilot gave schools total freedom to use the modules to suit their school schedules. A pedagogical coordinator for each school was trained at the beginning of the school year as part of the pilot. These trained coordinators were responsible for passing on that knowledge to teachers in charge of integrating the financial-literacy curriculum into their regular classes.

Monitoring questionnaires were sent to coordinators during the school year so that they could keep records of the implementation. The questionnaires helped supervisors to report any identified issue that could hamper good execution of the pilot. Two extras questionnaires were sent to supervisors during the first semester of the school year so they could report on the intensity and regularity with which the materials were used in the classrooms. These questionnaires were useful in identifying and correcting to some extent implementation issues during the year.

The questionnaires answered by teachers during data collection were useful to contextualize the results as they showed, for instance, that more than half of the teachers couldn't cover more than 60 percent of the training content in

classroom. Also, more than 50 percent of fifth to ninth graders reported they received the material in the middle of the school year; and about 18 percent of ninth graders said they received the material at the end of the year. There were some cases where materials were not given at all to the students. This percentage was up to about 10 percent among seventh graders.

Results

The literature on financial education suggests a simple theory of change where an increase in knowledge precedes attitudinal and behavioral changes. The results section is structured around the same logic. Also, we shed light on three potential channels influencing the main results. First, we used the mothers' level of instruction to see if the children's socio-economic background affects knowledge and attitudinal outcomes. Second, we checked whether the poor had more difficulty in learning. We did so by using information on whether the child is a beneficiary of the Brazilian conditional cash transfer, *Bolsa Família*. Third, we looked at the role played by the quality of program execution on the main outcomes. All results discussed here refer to the intention-to-treat (or ITT). This is the impact on those eligible to receive training rather than on those who actually received it. Results should be considered as the lower-bound effect of the program.

Financial proficiency

We used the standardized test score to measure the students' financial proficiency. The estimates are measured in terms of standard deviation (SD) so they can be compared across grades, subjects, and to other studies.

The aggregate effect pooling all grades was 0.07 SD (or 2 percent over the control mean). We split the sample between primary (third and fifth grades) and middle (seventh and ninth grades) school to check whether results were larger

Figure 1: ITT and QITT Estimates on Financial Proficiency of Third and Fifth Graders—95 percent CI

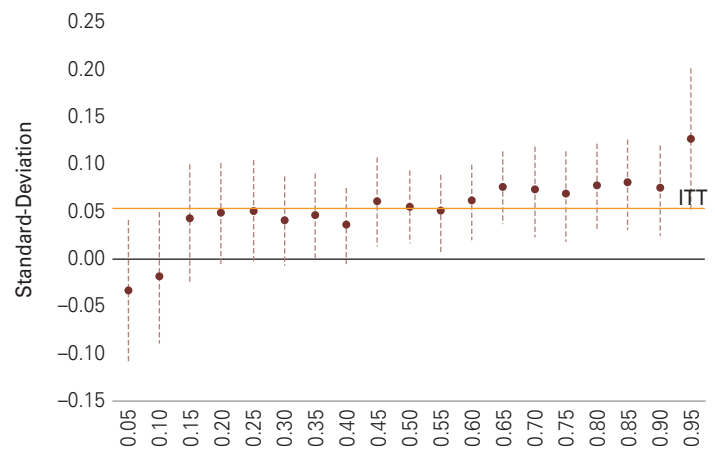
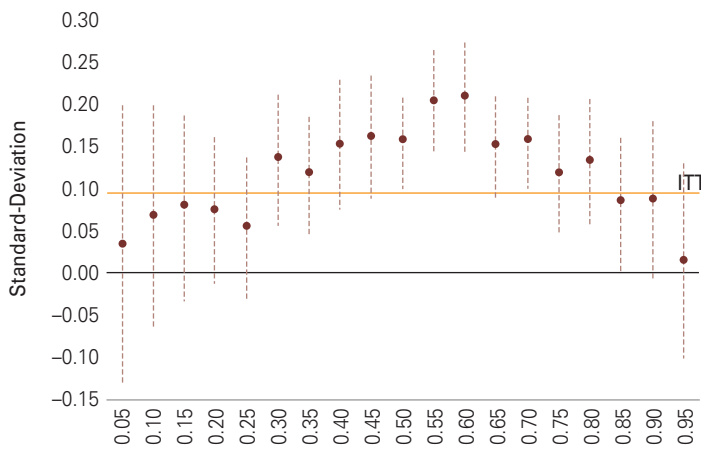


Figure 2: ITT and QITT Estimates on Financial Proficiency of Seventh and Ninth Graders—95 percent CI



for older students. **Figure 1** shows the results for third and fifth graders. The figure shows a positive, though small and statistically insignificant, ITT effect on financial proficiency of younger students. This means the average pool effect was driven by the impact on middle-school students. Interestingly, the QITT estimates show that the program had positive effects and statistically significant effects above the median of the financial proficiency distribution.

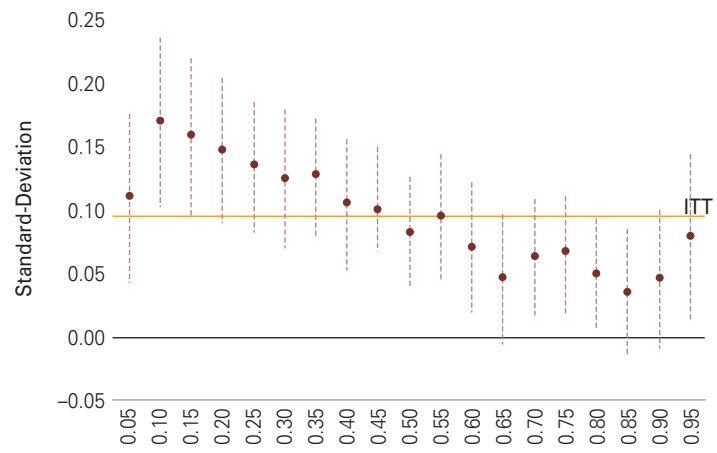
Figure 2 presents the estimates for seventh and ninth graders. The ITT effect on the older students is larger (0.09 SD) and statistically significant. The QITT estimates suggest that the program had larger effects at the lower tail of financial proficiency distribution. This is an interesting result per se and contrasts sharply with the results for younger students.

Attitudes Toward Consumption and Saving

We used the first score of a principal component analysis to compute both the consumption and saving indexes. The indexes take into account the questions on financial attitudes and habits. The indexes don't include third graders because, in their case, the parents or others responsible answered the questionnaire.

The results suggest that the pilot had positive effects on the consumption index of 0.09 SD. **Figure 3** shows that the ITT estimate for younger students was larger (0.12 SD) overall but mainly around the median of the consumption index distribution. This is an interesting finding as it seems to suggest that the link between knowledge and attitudes outlined in the theory of change is not straightforward. Interestingly, QITT estimates are relatively similar to the ITT (0.08 SD) for older students. The effect on the saving index was smaller (0.05 SD) and statistically significant only for primary-school students. Overall, the QITT estimates suggest that the program had distributional effects only for younger students.

Figure 3: ITT and QITT Estimates on Attitudes Toward Consumption of Fifth Graders—95 percent CI



Heterogeneous Effects

The empirical literature suggests that socio-economic background correlates with children's capacity to learn. Experimental evidence shows that children from disadvantaged households are less likely to develop socio-emotional skills, and that poverty has implications for decision making via behavioral biases such as limited attention and lack of self-control. We use the mother's education as a proxy for household socio-economic backgrounds and participation in the Brazilian CCT as a proxy for poverty status.

We proxy quality of pilot implementation using information on when the materials were delivered in the school and the percentage of content covered in classrooms during the school year.

Figure 4 shows the influence of the mothers' education on children's learning achievements. The results indicate that children with more educated mothers (with at least high-school degrees) seem to learn more. We believe that this might be either due to some type of demonstration effect (assuming that children assimilate some of parents' behavior and habits) or stimulation effect (more-educated mothers might value education and stimulate their children to study and learn). Interestingly, the results for attitudes indicate that children of less-educated mothers are more likely to have the better attitudes towards consumption and saving.

These results are not easy to reconcile, but it could be that families with less-educated mothers pay more attention to those issues, given their liquidity constraints. Because the attitudinal indexes capture answers under hypothetical scenarios, it could be that older children do not take those hypothetical questions seriously. It could also be that older children are either overconfident and hence less likely to take precautionary decisions regarding consumption and savings or even that they have a good understand of the institutional

Figure 4: ITT Estimates on Financial Proficiency by Mothers' Education—95 percent CI

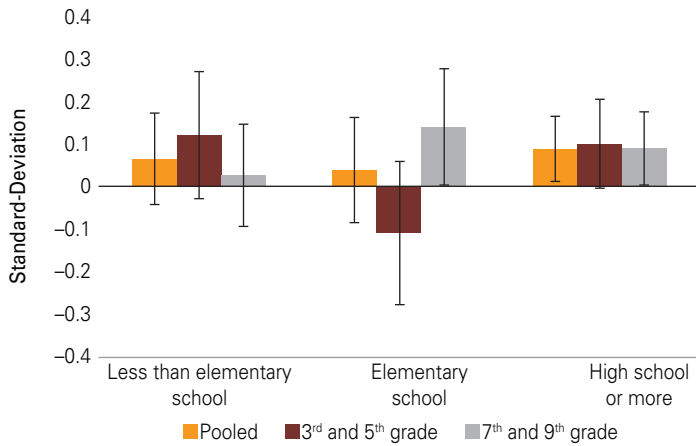
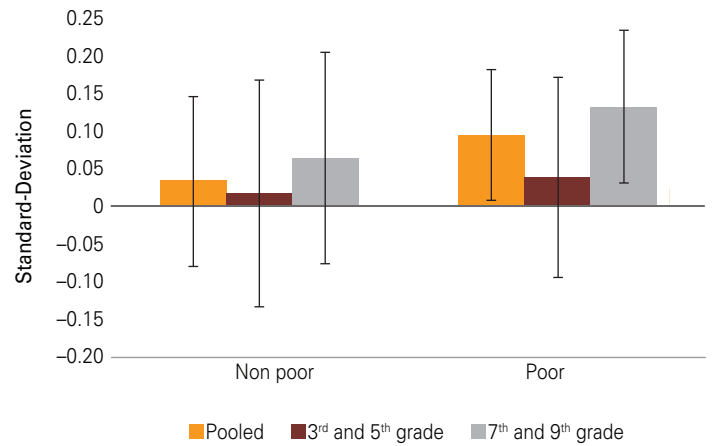


Figure 5: ITT Estimates on Financial Proficiency by Poverty Status—95 percent CI

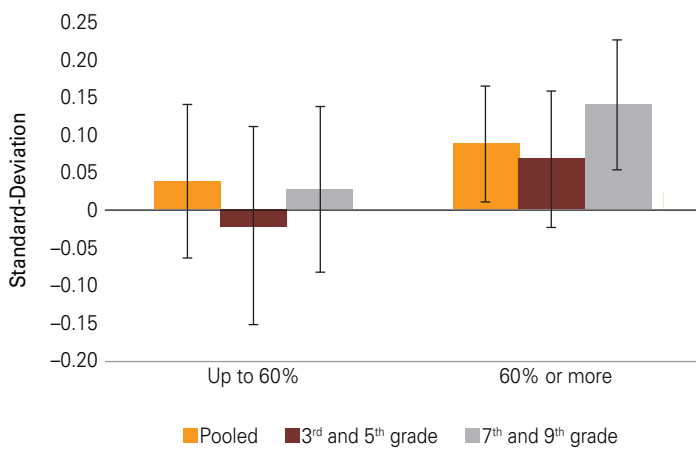


setting and thus don't see much value in financial planning. Our data doesn't allow us to rule out any of those competing explanations.

To check whether the poverty status of children affected their ability to learn, we compared the impacts of the program on the samples of beneficiaries and non-beneficiaries of *Bolsa Família*. Interestingly, the point estimates for these two groups are almost identical, but they are statistically significant only for the poor (see **figure 5**).

Finally, we check the role played by the quality of the program's execution on the main results. **Figure 6** shows that the training had positive and larger results when students were exposed to at least 60 percent of the curriculum. Again, the pooled effect is driven by middle-school students. Considering the consumption index, the result was not different across implementation quality, it was positive and statistically different from zero regardless of the use of the material. For the savings index, the result is statistically

Figure 6: ITT Estimates on Financial Proficiency by Quality of Program's Implementation—95 percent CI



different from zero only for primary school students where the program was well implemented.

Main Conclusions

The preliminary findings of the impact of a pilot program on financial education to elementary-school students suggest that the program did not have large effects on knowledge and attitudes. However, the average effects hide considerable heterogeneity and distributional effects. ITT estimates show that the program affected knowledge of middle-school students only. For primary-school students, the effect was positive and statistically significant only for the upper half of knowledge distribution. Interestingly, we did not find a strong correlation between knowledge and attitudinal outcomes as these showed up stronger among fifth graders.

We hypothesize two possible explanations for that result. First, it could be that older students have a clearer understanding of the institutional setting in Brazil and their hesitation in changing attitudes would be a rational decision given the incentives. The incentives in Brazil tend to privilege payments in instalments and encourage use of credit cards, practices that financial education tries to minimize to avoid over-indebtedness. If individuals are not credit constrained, then over-indebtedness shouldn't be a big problem. An alternative interpretation would suggest that formal knowledge doesn't easily translate into attitudinal and behavioral changes.

We look at heterogeneous effects to test three channels outlined by the empirical literature. First, we look at the influence of the mothers' education on children's outcomes. Second, we check whether the poor have more difficulty learning and assimilating new subjects. Finally, we look at how the program's execution may have influenced the results.

Our results suggest that knowledge is important but doesn't seem to be sufficient to affect attitudes and behavior. The challenge on how to translate knowledge into action remains open.