Analysis plan

The long-term impact of high-school financial education: Evidence from Spain

Olympia Bover, Laura Hospido, Margarita Machelett, and Ernesto Villanueva

Banco de España

This document pre-specifies the main analysis we will do before processing survey responses gathered by IMOP Insights S.A., the firm in charge of the survey fieldwork. This document was completed before analyzing the data, while finalizing the contract with IMOP Insights S.A. We outline our main sample restrictions, define the main primary and secondary outcomes, analytic specifications, and pre-specified control specifications.

Note that, while we mention primary and secondary outcomes, all survey responses will be included in the analysis and used for descriptive statistics to provide a comprehensive assessment of participants' employment, education, financial literacy, saving behavior and choices, as well as, household background during the state of alarm dictated in Spain due to the pandemic.

Section: Research strategy

We implement a survey about demographics, current and past employment and educational choices, labor market expectations, financial literacy and financial products knowledge and ownership, savings behavior, COVID-19 coverage policies and implement a convex budget set incentivized task. Survey participants are 9th-grade students that received the financial education training course in 2014-15 (9th grade is Tercero de la ESO in the Spanish schooling system), and 10-grade students that did not received this course (10th grade is Cuarto de la ESO in the Spanish schooling system).

Subsection: Sampling frame

We contact all participants in Bover, Hospido, and Villanueva (2020) whose families gave consent to be contacted again in the future. The initial sample size in the school year 2014-15 was over 5,099 students. In the long-term survey analysis, we expect a sample of approximately 1,250 participants. IMOP Insights S.A., the firm that implements the survey committed to achieving a survey completion rate of 70%, and we have a list of 1,790 students whose family gave consent to be contacted again.

Subsection: Data collection and sample restrictions

The survey and data are gathered by IMOP Insights S.A, the firm in charge of implementing the fieldwork. All responses will be received in its raw format. This ensures we keep the original data.

We will implement the following main sample restrictions:

- Drop invalid CATI surveys. These are surveys IMOP Supervisors suggest are not reliable. IMOP Insights S.A. guarantees high-quality data by completing as many surveys as possible with Computer Assisted Telephone Interviewing (CATI) and implementing standard revision checks.

- Drop invalid CAWI surveys. We consider a CAWI survey valid when the total time to complete the survey is below the minimum time other CATI surveys required and there is missing information in crucial sections of the questionnaire (in particular, financial competences). We impose this restriction as it is not possible to guarantee minimum attention or effort of respondents with this method.

Subsection: Data process

IMOP Insight S.A. provides the raw data, with education and occupation also aggregated into broad categories. As part of the fieldwork, interviews can also be supervised, pass standard revisions, and responses might have suggested modifications. All recommended modifications will be automatically implemented. We will also consider responses invalid when supervisors suggest the response is invalid (typically typos in replies or question not correctly framed or understood).

Subsection: Confidentiality

The fieldwork company requested consent to the parents or legal guardians of program participants to contact participants. Participants in the long-term survey also gave consent to participate in the study, and this consent can be revoked at any time.

All survey information is stored by the fieldwork company, which is subject to the Ley General de Protección de Datos (Personal Data Protection Act). In addition, all personal identifiable information is removed from the data and replaced with anonymous identifiers by the fieldwork company, making it possible to analyze records while preserving anonymity. Analysts at Banco de España do not have access to personal information, since it is removed by the fieldwork company, which stores information at their secured facilities.

For purposes of data supervision by authorized personnel at the Banco de España and the fieldwork company, interviews are available in a secure platform and these data will be deleted by December 2020.

The treatment of personal information is in accord to current legislation and has been included in the Registro de Actividades de Tratamiento published by Banco de España under the "Finance for all" program, following the guidelines of the Data Protection Officer (https://www.bde.es/bde/es/secciones/sobreelbanco/Transparencia/Informacion_inst/registro-de-acti/Plan_de_educaci_076e2ee49a40961.html).

IMOP Insights S.A., the firm in charge of implementing the survey complies with current Personal Data Protection Act, satisfies CCI-ESOMAR guidelines for social research and market practices, and it also adheres to the Code of Conduct CODIM.

Section: Empirical analysis

Empirical strategy:

Main:

a. Simple differences of outcomes between treated and control groups, controlling by the strata the school belongs to
b. Difference in difference for outcomes for which there is also information at baseline

The treated group are all surveyed participants that received financial education instruction in 9th grade and the control group are those that did not receive financial instruction that where in 10th grade. Following Bover, Hospido and Villanueva (2020), standard errors will be corrected for heteroscedasticity and arbitrary correlation at the school level.

Control specification:

- School FE
- Survey design controls: day of week and time of day of the first contact, first interviewer contacting participant FE
- Gender, being born in Spain, socioeconomic background, baseline schooling level expectations

We will include controls for strata in every specification, since the initial randomization was done at this level. We will also control for baseline covariates that are not balanced across groups. For that, we will implement the following alternative approaches:

i. Propensity score matching
ii. Re-weight control group sample to match on observable characteristics

Robustness approaches:

1. Double-step LASSO regressions to select observed controls relevant to explain outcomes and treatment variable
2. Altonji, Elder and Taber (2005) and Oster (2019) to assess the extent to which unobservable characteristics might drive the results

Subgroup analysis:

a. By type of school
b. By timing of allocation to treatment

Our main subgroup analysis will be based on stratification design characteristics of the initial intervention. We will also explore heterogeneous effects by subsamples based on their gender, baseline grade progression status and measures of household background.

Baseline exercise:

We will compare mean characteristics of treated and not treated participants included in Table 3 of Bover, Hospido and Villanueva (2020).

Outcomes:

In the following, we define primary and secondary outcomes. Note, however, that we implemented a comprehensive survey about labor and educational choices, labor and earning expectations, saving choices, financial knowledge, household finances knowledge, and status during the pandemic, as well as an incentivized convex budget task. All survey responses will be included in the analysis to provide a comprehensive understanding of the program impacts.

Primary outcomes:

1. Financial literacy: measured by total standardized score of correct answers on financial literacy module.
2. More general financial competences: measured by financial product familiarity, ownership (number of financial products owned, not relying on cash as the only means of saving, having a bank account), and digital inclusion (i.e., using digital means to complete transactions and/or access bank accounts).
3. Patience: measured by hypothetical saving choices, own patience preference assessments, and choosing later payment choices from incentivized convex time budget task.
4. Inconsistent choices in the saving task: number of inconsistent choices and split by type: (1) present bias, (2) split payment into two periods when the interest rate is 0, (3) prefer higher earlier payments as interest rate increases in incentivized convex set task.
5. Educational choice: measured by level of education, and educational choice in association to expected earnings, and other primary outcomes.

Our main hypotheses are that financial education training increases financial literacy, financial sophistication, patience, and decreases the likelihood of making inconsistent choices. Furthermore, we will test whether educational choices are different between treated and untreated students. We will explore whether and how the impact on the other primary outcomes is associated with different schooling choices. In that respect, we posit that financial education has long term-impacts in education through these other primary outcomes, improving schooling decisions, that is, by making treated students more responsive to the difference between expected costs and benefits of their choices. Hence, we will test whether:

a) Financial education has long-term impacts in education through completion of more advanced degrees, all else equal.

b) An increase in financial literacy improves decision choices in schooling. There is a higher correlation between schooling and monetary returns of education, and between schooling and estimated discount rates.

Secondary outcomes:

1. Financial literacy by area (e.g., inflation, simplest interest rate, compound interest rate)
2. Self-perceived financial literacy level
3. Self-perceived own household finances knowledge
4. Financial product acquisition process (1) how product is chosen, (2) what sources of information help determine choice
5. Propensity to donate money

References:

- Altonji, Joseph, Todd Elder, and Christopher Taber (2005) "Selection on observed and unobserved variables: Assessing the effectiveness of Catholic Schools.", Journal of Political Economy, 113(1), 151-184.
- Bover, Olympia, Laura Hospido, and Ernesto Villanueva (2020) "The impact of high school financial education on financial knowledge and choices: Evidence from a randomized trial in Spain.", available at http://laurahospido.com/wp-content/uploads/2020/06/20200602_bhv_s.pdf

- Oster, Emily (2019) “Unobservable Selection and Coefficient Stability: Theory and Evidence.”, Journal of Business & economic Statistics 37 (2), 187-204.