

Is School-Based Financial Education Effective?

Immediate and Long-Lasting Impacts on High School Students

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Financial Education

- Strong link between financial literacy and economic outcomes (Behrman et al., 2012; Lusardi and Mitchell, 2014; Bianchi, 2018; van Rooij et al., 2012)
- ... but skepticism about financial education programs's ability to improve financial skills, choices, and behavior
- Experimental evidence for children and youth is promising:
 - Significant immediate impacts of school-based financial education on financial **literacy** (Kaiser and Menkhoff, 2019; Frisancho, 2019)
 - However, limited evidence on long-lasting effects on financial **behavior**

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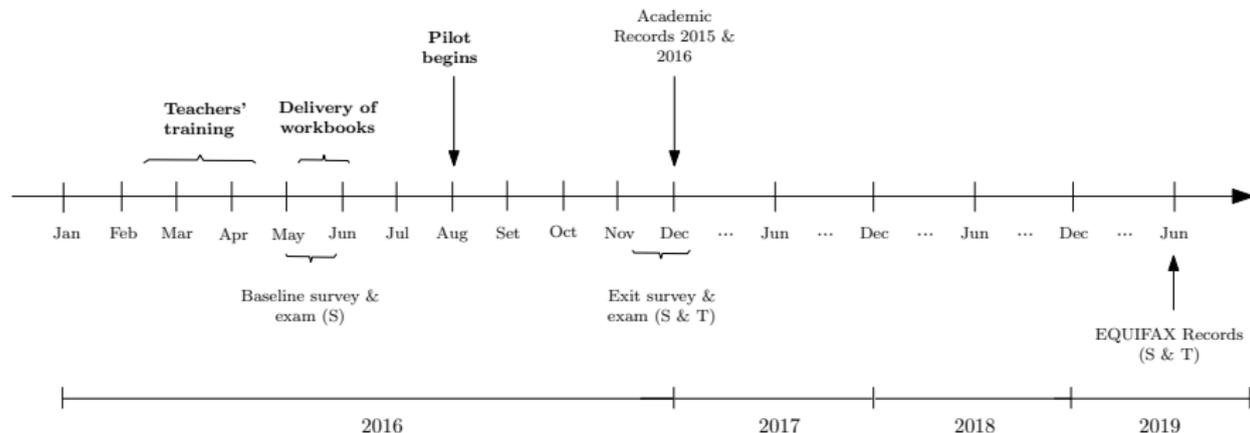
- This paper measures short and long-term impacts of financial education on high-school students' financial skills and behavior
- Previous evidence:
 - Experimental studies with survey data and short horizons: Bruhn et al. (2016), Bover et al. (2018), Jamison et al. (2014), and Luhrmann et al. (2018)
 - Non-experimental studies rely on course-requirement variation and EQUIFAX data: Cole et al. (2016), Brown et al. (2016), Urban et al. (2020)
- Contributions:
 - High-stakes data to measure long-lasting effects on behavior in an experimental setting
 - Focus on the program's opportunity cost in terms of academic outcomes

The School-Based Fin Ed Intervention

- Public/private partnership to provide financial education in high schools
- Treatment package:
 - Grade-specific workbooks Lessons by grade
 - Teachers' training (20 hours in 5 sessions)
 - Request to deliver content during a regular course Teachers' Compliance

Sample, Randomization, and Timeline

- Universe: full-day public secondary schools in urban areas (N=300)
 - Pairing of schools by observables within region
 - Randomization within pairs Balance
- Sample: One classroom per grade/school sampled at random: \sim 20,000 students (900 classrooms)



Data and Measurement

- Survey and exam data: financial literacy and students's background characteristics, soft skills, preferences, and financial behavior
- School academic records: GPAs by course and grade progression
- Credit bureau records: credit histories by June 2019
 - EQUIFAX data includes all adults in the country: 98% match rate
 - Snapshot of outstanding debt by type and retrospective information on delinquency in non-credit bills

Empirical Strategy

- The impact of the pilot is estimated by an ITT OLS regression:

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

where y_{ijp} is the outcome of interest for student/teacher i in school j from pair p .

Impact on Financial Literacy and Financial Behavior

| | Financial Literacy (1) | Financial Autonomy (2) | Pr(Saving) (3) | Financial Savviness (4) |
|-----------|------------------------------|------------------------------|-------------------|-------------------------------|
| Treatment | 0.157***† † † (0.023) | 0.024**† (0.010) | 0.013 (0.009) | 0.030***† † † (0.008) |
| N Obs | 19462 | 16675 | 13917 | 17116 |
| N Schools | 296 | 296 | 296 | 296 |

Note: All outcomes are measured at the end of the 2016 academic year. Scores in the financial literacy exams are standardised at the grade level, using the distribution of the control group in the baseline exam as a benchmark. The financial autonomy index aggregates fifteen binary variables capturing whether students felt empowered, confident, and capable of making independent financial choices and influencing their households' financial decisions. The financial savviness index aggregates four binary variables measuring if the student keeps a budget, saves before buying something that cannot be afforded, compares prices, and bargains before shopping. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels based on the Romano-Wolf adjusted p-values († 10%, † † 5%, † † † 1%) resulting from 1,000 bootstrap replications.

- Large impact on financial skills, aligned with similar studies in Brazil and Spain

Meta-Analysis

- Modest trickle down effects on financial behavior

Impact on Credit and Delinquency Outcomes

| | Pr(Debt) (1) | Pr(Arrears) | | Log(Current Debt) (4) | Log(Debt Arrears) | |
|--------------|-------------------|-------------------|--------------------|-----------------------------|----------------------|--------------------|
| | | Loans (2) | Other bills (3) | | Loans (5) | Other bills (6) |
| Treatment | -0.002 (0.003) | -0.001 (0.001) | 0.002 (0.002) | 0.161 (0.107) | -0.226**† (0.106) | -0.038 (0.117) |
| N Obs | 19113 | 19113 | 19113 | 902 | 902 | 658 |
| N Schools | 296 | 296 | 296 | 249 | 249 | 251 |
| Mean Control | 0.049 | 0.006 | 0.034 | 5.203 | 0.571 | 3.960 |

Note: Students' credit and default outcomes measured in June 2019. Current debt and debt in arrears are measured in US dollars and log-transformed. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels based on the Romano-Wolf adjusted p-values († 10%, †† 5%, ††† 1%) resulting from 1,000 bootstrap replications.

- No sample selection into borrowing
- 20% reduction in arrears, but no impact on current debt

Impact on Academic Outcomes

| | GPAs | | | | Grade Progression (5) | University Aspirations (6) |
|-----------|-------------------|-------------------|-------------------|------------------|--------------------------|-------------------------------|
| | Cumulative (1) | Math (2) | Verbal (3) | HGE (4) | | |
| Treatment | -0.015 (0.014) | -0.007 (0.019) | 0.033* (0.018) | 0.001 (0.020) | 0.002 (0.009) | -0.002 (0.005) |
| N Obs | 19035 | 19035 | 19035 | 19035 | 18558 | 19032 |
| N Schools | 296 | 296 | 296 | 296 | 296 | 296 |

GPAs are measured at the end of the 2016 academic year and standardized by grade relative to the control group in the original experimental sample of 300 schools. Grade progression is a binary variable indicating if the student was promoted to the next grade at the end of the 2016 academic year (graduated in the case of 11th grade students). Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels based on the Romano-Wolf adjusted p-values († 10%, †† 5%, ††† 1%) resulting from 1,000 bootstrap replications.

- No impact on grades or grade progression

Discussion

- Effect on arrears is economically meaningful in size: 0.147 SD drop in the balance of delinquent debt
 - Particularly large when benchmarked against a recent meta-analysis (Kaiser et al., 2022): the average effect size on credit outcomes is 0.042 SD
- Reduction in arrears may have important implications on youth's future access to credit and borrowing conditions
- There does not seem to be a downside: academic outcomes are unaffected

Impact on Teachers' Financial Knowledge and Behavior

| | Financial Literacy (1) | Financial Autonomy (2) | Pr(Saving) (3) | Savings Balance (4) | Financial Savviness (5) |
|-----------|------------------------------|------------------------------|----------------------|---------------------------|-------------------------------|
| Treatment | 0.319***†† (0.100) | 0.087 (0.068) | 0.087**†† (0.035) | 516.7* (268.4) | 0.009 (0.044) |
| N Obs | 417 | 347 | 334 | 334 | 335 |
| N Schools | 250 | 214 | 214 | 214 | 214 |

Note: All outcomes are measured at the end of the 2016 academic year. Scores in the financial literacy exams are standardised at the grade level, using the distribution of the control group in the baseline exam as a benchmark. The financial autonomy index aggregates fifteen binary variables capturing whether teachers felt empowered, confident, and capable of making independent financial choices and influencing their households' financial decisions. The financial savviness index aggregates four binary variables measuring if the teacher keeps a budget, saves before buying something that cannot be afforded, compares prices, and bargains before shopping. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote the Romano-Wolf adjusted p-values († 10%, †† 5%, ††† 1%) resulting from 1,000 bootstrap replications.

- Large impact on financial skills relative to previous meta-analysis
- Important changes in saving behavior on the extensive and intensive margin
- Results indicative of program quality: knowledgeable trainers

Impact on Teachers' Credit and Delinquency Outcomes

| | Pr(Debt) | Pr(Arrears) | | Log(Current Debt) | Log(Debt Arrears) | |
|--------------|------------------|-------------------|------------------|-------------------|-------------------|------------------|
| | | Loans | Other bills | | Loans | Other bills |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Treatment | 0.022 (0.040) | -0.012 (0.013) | 0.001 (0.039) | -0.010 (0.246) | -0.212 (0.132) | 1.035 (0.826) |
| N Obs | 414 | 414 | 414 | 257 | 257 | 101 |
| N schools | 249 | 249 | 249 | 188 | 188 | 88 |
| Mean Control | 0.605 | 0.029 | 0.254 | 8.213 | 0.281 | 4.542 |

Note: Teachers' credit and default outcomes measured in June 2019. Current debt and debt in arrears are measured in US dollars and log-transformed. School pairs with incomplete survey records for at least one school are excluded from estimation. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels based on the Romano-Wolf adjusted p-values († 10%, †† 5%, ††† 1%) resulting from 1,000 bootstrap replications.

- No long-lasting impact in terms of credit outcomes among teachers
- Teachers faced relatively larger knowledge gaps on saving topics

Conclusion

- Governments debate about the inclusion of financial education in official school curriculum
 - Critical to evaluate effectiveness of school-based programs
- This paper shows that there are large immediate knowledge gains that trickle down and change behavior
 - Long-lasting effects on arrears early on economic lives
- Additionally, financial education does not hinder academic performance
- Support for formal inclusion of content in school curricula

Thank you

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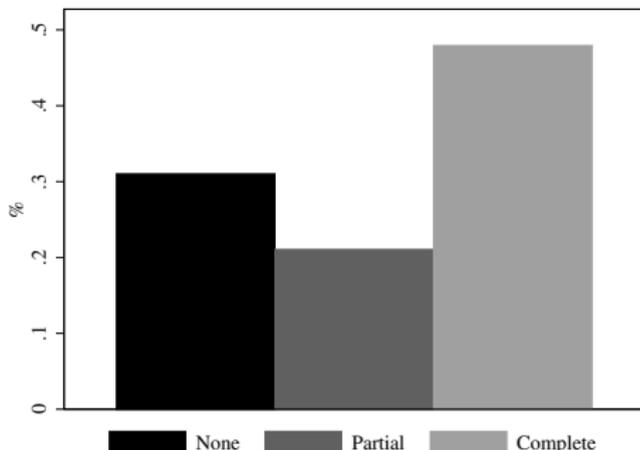
<https://veronicafrisancho.net/>

Lessons by grade

| 9th | 10th | 11th |
|---|---|---|
| <ul style="list-style-type: none">1. Needs and resources<ul style="list-style-type: none">1.1. Wants vs. needs1.2. Opportunity cost1.3. Savings/credit, expenditure/investment1.4. Economic agents | <ul style="list-style-type: none">1. Financial products and services<ul style="list-style-type: none">1.1. Financial system1.2. Saving vs. Investment1.3. Assets and liabilities1.4. Financial future and capacity to pay1.5. Adequate usage of financial products and services | <ul style="list-style-type: none">1. Responsible financial consumer<ul style="list-style-type: none">1.1. Capacity to pay1.2. Overindebttness1.3. Financial consumer's rights1.4. Protection of consumer rights1.5. The State and financial stability |
| <ul style="list-style-type: none">2. Budgeting<ul style="list-style-type: none">2.1. Financial plan2.2. Income and expenses2.3. Budgeting2.4. Usefulness of budgets | | <ul style="list-style-type: none">2. Information<ul style="list-style-type: none">2.1. Transparency in financial contracts2.2. Consumers' responsibilities |

Teachers' Compliance with the Treatment

- Modest/high compliance in terms of training and coverage of lessons:
 - 73% teachers attended at least one training session and 43% attended all
 - Almost half of the teachers in the treatment group taught all lessons



Balance check: Students' characteristics (I)

| Variable | Control mean | T-C | N |
|---|-------------------|--------------------|-------|
| Sex | 1.502 [0.500] | -0.010 [0.013] | 20817 |
| Age | 15.160 [1.219] | 0.005 [0.021] | 16721 |
| Ratio of household members to bedrooms | 1.852 [0.996] | 0.008 [0.016] | 20002 |
| Mother's education: Primary or less | 0.429 [0.495] | 0.006 [0.012] | 19371 |
| Mother's education: Secondary | 0.419 [0.493] | 0.010 [0.009] | 19371 |
| Mother's education: More than secondary | 0.152 [0.359] | -0.015 [0.009]* | 19371 |
| Lives with both parents | 0.589 [0.492] | 0.003 [0.009] | 20245 |
| Asset index | -0.000 [1.000] | -0.025 [0.029] | 20388 |
| High level of parental supervision | 0.755 [0.430] | 0.008 [0.006] | 19330 |
| Has dinner with parents 7 days a week | 0.321 [0.467] | -0.002 [0.007] | 20444 |
| Truancy in the past 2 weeks | 0.058 [0.234] | -0.006 [0.003] | 20461 |
| GPA 2015 | 13.727 [1.484] | -0.028 [0.042] | 18382 |

Note: Significance levels (* 10%; ** 5%; *** 1%) captured through OLS estimation with robust standard errors. Standard errors(deviations) of coefficients(control means) are in brackets.

Balance check: Students' characteristics (II)

| Variable | Control mean | T-C | N |
|---|--------------------|--------------------|-------|
| Impulsiveness | -0.000 [1.000] | 0.025 [0.014]* | 17435 |
| Conscientiousness | -0.000 [1.000] | 0.004 [0.016] | 15724 |
| Self-control | 0.000 [1.000] | 0.002 [0.016] | 16893 |
| Hyperbolic preferences | 0.126 [0.332] | -0.006 [0.004]* | 18262 |
| Risk lover | 0.077 [0.267] | -0.001 [0.003] | 19161 |
| No previous exposure to financial education | 0.367 [0.482] | -0.013 [0.009] | 19162 |
| Financial literacy raw score | 8.060 [2.943] | 0.110 [0.078] | 20625 |
| Financial autonomy (1-75) | 40.848 [12.911] | 0.384 [0.189]** | 19520 |
| Prepares a personal budget | 0.566 [0.496] | -0.012 [0.007]* | 18347 |
| Helps family with budget | 0.679 [0.467] | 0.008 [0.007] | 18580 |

Note: Significance levels (* 10%; ** 5%; *** 1%) captured through OLS estimation with robust standard errors. Standard errors(deviations) of coefficients(control means) are in brackets.

Balance check: Teachers' characteristics

| Variable | Control mean | T-C | N |
|------------------------------|--------------------|----------------------|-----|
| Sex | 0.577 [0.495] | -0.108 [0.041]*** | 452 |
| Age | 46.755 [11.028] | -0.924 [0.958] | 431 |
| Undefined contract teacher | 0.637 [0.482] | -0.006 [0.038] | 434 |
| Workload (hours) | 0.797 [0.404] | -0.050 [0.041] | 378 |
| Years of teaching experience | 17.177 [10.217] | -0.649 [1.004] | 400 |
| Degree in Social Sciences | 0.632 [0.484] | 0.014 [0.052] | 392 |
| Higher education | 0.332 [0.472] | 0.055 [0.046] | 425 |
| Teaches in 9th grade | 0.531 [0.500] | 0.060 [0.038] | 452 |
| Teaches in 10th grade | 0.526 [0.501] | 0.037 [0.037] | 452 |
| Teaches in 11th grade | 0.488 [0.501] | 0.030 [0.036] | 452 |

Note: Significance levels (* 10%; ** 5%; *** 1%) captured through OLS estimation with robust standard errors. Standard errors(deviations) of coefficients(control means) are in brackets.

Average Effect Sizes of Programs Targeting Youth

