

The Impact of School-Based Financial Education on High School Students and their Teachers

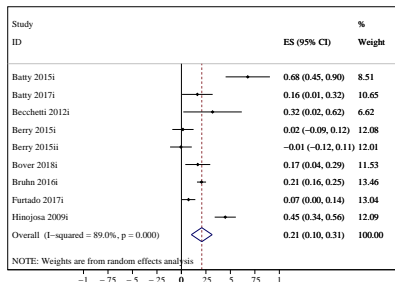
Veronica Frisancho[†]

[†]Inter-American Development Bank, Research Department (vfrisancho@iadb.org)

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Motivation

- Financial education has become a key tool to promote financial inclusion
 - Remedial: (at risk) adults
 - Limited or null impact on financial knowledge and behavior
- However, evidence of sizeable effects among the youth
 - Malleability of preferences and habits
 - Captive audience in school-based programs: greater participation rates



This Paper

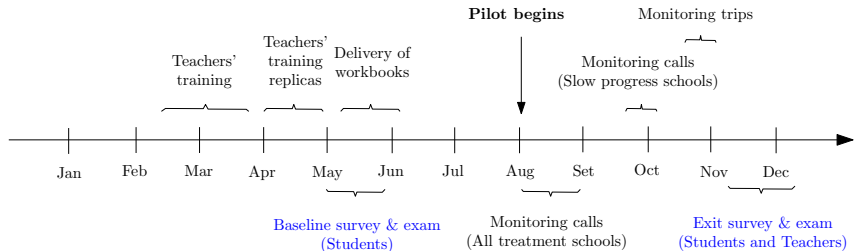
- Measures the impact of school-based financial education on high school students and their teachers.
 - Large-scale RCT in Peru (300 schools and 6 regions)
 - Target grades (ages): 9th-11th (14-16)
- Contributions:
 - Provides experimental evidence for the youth
 - Measures impact on knowledge, soft skills and preferences, and behavior
 - Some personality traits seem to be associated with financial choices (Strömbäck et al., 2018 and Gathergood, 2012)
 - Measures impact on teachers
 - Evaluates cost-effectiveness of the intervention

The Intervention: *Finanzas en mi Colegio*

- Treatment consisted of:
 - Delivery of grade-specific workbooks Lessons
 - Teachers' training
 - Request to deliver content during a regular course

Sample Selection, Randomization, and Timeline

- Within each of the 6 regions intervened, pairing of schools by observables
- Randomization within pairs in a sample of 300 schools Balance
 - One classroom sampled at random: $\sim 21,000$ students



Empirical Strategy

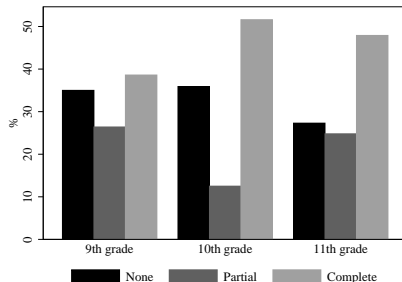
- The impact of the pilot is estimated by an ITT OLS regression:

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

where y_{ijp} could be financial knowledge, socioemotional traits, preferences, or behavior of student or teacher i in school j from pair p .

Compliance

- Modest compliance in terms of training and coverage of lessons:
 - 73% teachers attended at least one training session and 43% attended all
 - Bimodal distribution of lessons' coverage



Students: Financial Knowledge & Academic Outcomes

	All	9th Grade	10th Grade	11th Grade
Financial Knowledge (Exam Score)	0.143*** [0.022]	0.150*** [0.033]	0.102*** [0.031]	0.195*** [0.029]
Number of Observations	19673	6697	6567	6409
Number of Clusters	298	298	298	298
Cumulative GPA	0.181*** [0.046]	0.199*** [0.047]	0.159*** [0.048]	0.189*** [0.052]
Number of Observations	19170	6513	6399	6258
Number of Clusters	298	298	298	298
Grade Progression	0.001 [0.009]	0.016 [0.012]	-0.018 [0.012]	0.009 [0.010]
Number of Observations	18313	6136	6106	6071
Number of Clusters	298	298	298	298
Engagement	0.006 [0.013]	0.014 [0.018]	-0.017 [0.019]	0.023 [0.020]
Number of Observations	17596	5984	5887	5725
Number of Clusters	298	298	298	298

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

Students: Socioemotional Skills & Preferences

	All	9th Grade	10th Grade	11th Grade
Consciousness	-0.014	-0.024	-0.036*	0.015
	[0.013]	[0.019]	[0.019]	[0.021]
Number of Observations	15848	5294	5276	5278
Number of Clusters	298	298	298	298
Self-control	0.028**	0.017	0.061***	0.012
	[0.014]	[0.021]	[0.020]	[0.021]
Number of Observations	17391	5845	5846	5700
Number of Clusters	298	298	298	298
Impulsiveness	-0.003	0.012	-0.013	-0.008
	[0.014]	[0.023]	[0.022]	[0.022]
Number of Observations	13156	4215	4491	4366
Number of Clusters	298	294	294	296
Risk aversion	0.008	-0.028**	0.018*	0.037***
	[0.007]	[0.011]	[0.011]	[0.012]
Number of Observations	13473	4365	4591	4482
Number of Clusters	298	298	294	296
Hyperbolic preferences	-0.001	0.015	-0.018*	0.005
	[0.005]	[0.010]	[0.009]	[0.009]
Number of Observations	13326	4433	4524	4321
Number of Clusters	298	294	296	298

Students: Financial Behavior

	All	9th Grade	10th Grade	11th Grade
Budgeting	0.006 [0.007]	0.017 [0.011]	-0.007 [0.010]	0.005 [0.012]
Number of Observations	15852	5186	5338	5278
Number of Clusters	298	296	296	298
Compares prices	0.012* [0.007]	0.012 [0.012]	0.002 [0.012]	0.024** [0.012]
Number of Observations	16236	5361	5450	5390
Number of Clusters	298	298	294	298
Saves to buy	0.013*** [0.005]	0.011 [0.007]	0.020*** [0.007]	0.015** [0.007]
Number of Observations	16720	5562	5598	5522
Number of Clusters	298	298	294	298
Bargaining	0.005 [0.007]	-0.008 [0.012]	0.007 [0.012]	0.025** [0.011]
Number of Observations	16236	5361	5450	5390
Number of Clusters	298	298	294	298
Talks to parents about financial decisions	0.011* [0.007]	0.019* [0.011]	0.007 [0.010]	0.003 [0.011]
Number of Observations	16528	5433	5545	5486
Number of Clusters	298	296	294	298
Financial autonomy index	0.011 [0.015]	-0.021 [0.026]	-0.012 [0.023]	0.073*** [0.026]
Number of Observations	16883	5604	5673	5568
Number of Clusters	298	298	294	298

Students: Results

- Strong effects on financial knowledge (0.14 SD)
 - Learning gains are not in detriment of student performance
- Global effect on self-control, shopping habits, and talking to parents about finances
- Grade-specific impacts on behavior vary according to content:
 - 9th graders talk more to their parents about financial decisions
 - 10th graders save more before buying something they cannot afford
 - 11th graders develop greater levels of financial autonomy and better saving and shopping habits

Teachers: Financial Knowledge, Socioemotional Skills, & Preferences

Financial Knowledge		Socioemotional & Preferences	
Exam score	0.320*** [0.100]	Consciousness	0.105 [0.110]
Number of Observations	417	Number of Observations	240
Number of Clusters	250	Number of Clusters	164
Self-Assessment	0.352*** [0.089]	Self-control	0.066 [0.089]
Number of Observations	352	Number of Observations	255
Number of Clusters	224	Number of Clusters	170
Teaching Efficacy	0.010 [0.087]	Impulsiveness	0.136* [0.078]
	318	Number of Observations	290
	206	Number of Clusters	184
		Risk aversion	0.070* [0.036]
		Number of Observations	332
		Number of Clusters	212
		Hyperbolic preferences	0.030 [0.036]
		Number of Observations	311
		Number of Clusters	198

Teachers: Financial Behavior

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

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

Teachers: Results

- Teachers' financial knowledge increased considerably (0.32 SD)
- The probability that they save also goes up, especially for formal savings
- These effects are at odds with the limited impact of financial education programs among adults:
 - Simplifying concepts and repeating them to students may be an important learning strategy
 - Treatment effects are increasing in level of repetition By repetition

Conclusion

- Overall, *Finanzas en mi Colegio* was extremely effective in improving high school students' and teachers' financial knowledge
- Changes in students' behavior consistent with content delivered by grade
- Important effect on self-control despite lack of direct focus on this skill
 - Suggestive evidence on the channels activated among youth
- Large effects on teachers' knowledge and saving habits
 - Indicative of potential impact among adults under more intensive programs
- Despite partial compliance, the program was highly cost-effective:
 - Impact on financial knowledge is 0.14SD at a cost of US\$ 6.6 per student
 - Cost-effectiveness ratio higher than for interventions promoting learning

Thank you

vfrisancho@iadb.org

Balance check: School characteristics

Variable	Control mean	T-C	N
Number of teachers	22.347 [12.497]	0.213 [1.415]	300
Number of students	362.973 [222.866]	-3.107 [25.412]	300
Number of classrooms	13.887 [7.516]	-0.073 [0.841]	300
Number of students, 3rd grade	72.060 [42.631]	0.747 [4.952]	300
Number of students, 4th grade	68.880 [41.459]	-0.500 [4.767]	300
Number of students, 5th grade	64.933 [42.250]	-0.207 [4.692]	300
Number of classrooms, 3rd grade	2.773 [1.542]	0.020 [0.171]	300
Number of classrooms, 4th grade	2.660 [1.423]	-0.007 [0.164]	300
Number of classrooms, 5th grade	2.553 [1.412]	-0.020 [0.161]	300
Passing rate, 3rd grade	0.702 [0.141]	-0.005 [0.016]	300
Passing rate, 4th grade	0.742 [0.128]	-0.010 [0.015]	300
Passing rate, 5th grade	0.801 [0.122]	0.006 [0.015]	300
Dropout rate, 3rd grade	0.032 [0.036]	-0.003 [0.004]	300
Dropout rate, 4th grade	0.031 [0.038]	-0.002 [0.004]	300
Dropout rate, 5th grade	0.018 [0.023]	0.000 [0.003]	300

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: Student characteristics (I)

Variable	Control mean	T-C	N
Sex	1.504 [0.500]	-0.009 [0.017]	20961
Age	15.178 [1.220]	-0.003 [0.034]	18600
Ratio of household members to bedrooms	1.852 [0.992]	0.008 [0.024]	20140
Mother's education: Primary or less	0.429 [0.495]	0.006 [0.027]	19508
Mother's education: Secondary	0.419 [0.493]	0.008 [0.017]	19508
Mother's education: More than secondary	0.152 [0.359]	-0.014 [0.016]	19508
Lives with both parents	0.590 [0.492]	-0.000 [0.016]	20384
Asset index	0.000 [1.000]	-0.008 [0.083]	20475
High level of parental supervision	0.755 [0.430]	0.005 [0.010]	19456

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: Student characteristics (II)

Variable	Control mean	T-C	N
Impulsiveness	-0.000 [0.879]	0.016 [0.022]	17546
Conscientiousness	-0.000 [0.884]	0.005 [0.024]	15807
Self-control	-0.000 [0.887]	-0.004 [0.023]	16984
Time inconsistency: hyperbolic	0.110 [0.313]	-0.006 [0.005]	20983
Risk averse	0.708 [0.455]	0.007 [0.010]	19280
No previous exposure to financial education	0.368 [0.482]	-0.015 [0.013]	19282
Financial literacy standardized score	-0.000 [1.000]	0.042 [0.045]	20702
Financial autonomy (standardized)	0.000 [1.000]	0.024 [0.035]	20851
Total in earnings in past month (USD)	113.849 [344.953]	6.216 [8.271]	20983
Total expenditures in the past month	417.816 [865.320]	35.478 [24.958]	16791
Prepares a personal budget	0.565 [0.496]	-0.012 [0.010]	18465
Helps family with budget	0.679 [0.467]	0.005 [0.013]	18692

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

Lessons by grade

9th	10th	11th
1. Needs and resources 1.1. Wants vs. needs 1.2. Opportunity cost 1.3. Savings/credit, expenditure/ investment 1.4. Economic agents	1. Financial products and services 1.1. Financial system 1.2. Saving vs. Investment 1.3. Assets and liabilities 1.4. Financial future and capacity to pay 1.5. Adequate usage of financial products and services	1. Responsible financial consumer 1.1. Capacity to pay 1.2. Overindebttness 1.3. Financial consumer's rights 1.4. Protection of consumer rights 1.5. The State and financial stability
2. Budgeting 2.1. Financial plan 2.2. Income and expenses 2.3. Budgeting 2.4. Usefulness of budgets		2. Information 2.1. Transparency in financial contracts 2.2. Consumers' responsibilities

Data

- One classroom per grade and all target teachers
- Survey data and administrative student records

	Baseline	Merge with FU	Merge with admin
Students	20,908	16,735	19,307
Teachers		486	

Teachers: by level of repetition (I)

	None	Low	High		None	Low	High
Financial Knowledge (Exam Score)	0.091 [0.153]	0.383** [0.159]	0.468*** [0.144]	Consciousness	0.391** [0.172]	-0.221 [0.173]	0.387* [0.218]
Number of Observations		417		Number of Observations		240	
Number of Clusters		250		Number of Clusters		164	
Self-Assessment	0.139 [0.170]	0.301** [0.133]	0.593*** [0.144]	Self-control	0.214 [0.194]	0.078 [0.132]	-0.113 [0.217]
Number of Observations		352		Number of Observations		255	
Number of Clusters		224		Number of Clusters		170	
Teaching Efficacy	-0.004 [0.183]	-0.176 [0.140]	0.277* [0.153]	Impulsiveness	0.196 [0.169]	0.078 [0.133]	0.159 [0.128]
Number of Observations		318		Number of Observations		290	
Number of Clusters		206		Number of Clusters		184	
				Risk aversion	0.107 [0.067]	0.064 [0.058]	0.048 [0.065]
				Number of Observations		332	
				Number of Clusters		212	
				Hyperbolic preferences	0.027 [0.080]	0.025 [0.056]	0.040 [0.064]
				Number of Observations		311	
				Number of Clusters		198	

Teachers: by level of repetition (II)

	None	Low	High		None	Low	High
Budgeting	-0.003 [0.057]	-0.045 [0.037]	0.021 [0.036]	Saves	0.091 [0.068]	0.063 [0.053]	0.112** [0.052]
Number of Observations		331		Number of Observations		334	
Number of Clusters		212		Number of Clusters		214	
Compares prices	0.133 [0.092]	0.019 [0.078]	0.123 [0.085]	Saves formally	0.053 [0.102]	0.143** [0.072]	0.213*** [0.067]
Number of Observations		315		Number of Observations		376	
Number of Clusters		204		Number of Clusters		232	
Saves to buy	0.112 [0.123]	0.081 [0.071]	-0.019 [0.069]	Saves informally	0.129 [0.084]	0.027 [0.063]	0.105* [0.058]
Number of Observations		290		Number of Observations		334	
Number of Clusters		190		Number of Clusters		214	
Bargains	-0.248*** [0.092]	0.030 [0.074]	-0.053 [0.093]				
Number of Observations		315					
Number of Clusters		204					
Financial Autonomy Index	0.072 [0.184]	0.028 [0.143]	0.295* [0.158]				
Number of Observations		347					
Number of Clusters		214					