

Financial Education and Savings Behavior: Evidence from a Randomized Experiment among Low-Income Clients of Branchless Banking in India

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I. Introduction

Thanks to innovations in new technology-based banking systems, between 500 and 800 million of the world's poor now have access to financial services (Deb and Kubzansky 2012). However, most of these individuals are not prepared to interact with the growing complexities of financial products and services. Recent results from both developed and developing countries (summarized in Xu and Zia 2012; Lusardi and Mitchell 2014, 2011) show low levels of financial literacy, including low knowledge and skills around basic concepts of personal financial management or more general banking practices.

A growing literature finds that financial literacy is correlated with household well-being, including participation in savings and investments (Van Rooij, Lusardi, and Alessie 2011; Behrman et al. 2012) and planning for retirement (Lusardi and Mitchell 2007). This suggests that financial knowledge leads to

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responsible financial behavior among consumers, and so a rising number of countries are developing national financial education strategies and making more investments in related programs (Grifoni and Messy 2012).

However, the evidence from field experimental research linking financial education and savings outcomes provides mixed results and suggests that there is little impact from trainings on actual savings behavior (for meta-analyses of the recent literature, see Miller et al. 2015; Kaiser and Menkhoff 2016). For example, Duflo and Saez (2003) measure the impact of a benefit fair on retirement plan enrollment among employees of a university in the United States but found small effects on actual enrollment. Cole, Sampson, and Zia (2011) look at the impact of financial education training among the unbanked in Indonesia and find no substantial effect on savings behavior. In Brazil, Bruhn et al. (2016) look at a high school financial education, incorporated in the standard curriculum during three academic semesters, and reported impact on many outcomes but not savings. Both McKenzie and Woodruff (2014) and Miller et al. (2015) summarize the results of a number of financial literacy training programs around the world and find few, if any, impacts on savings, although they note a number of issues with many of the evaluations that could affect the results. There are also two recent studies that have found impacts from trainings on savings behavior: Sayinzoga, Bulte, and Lensink (2016) work with smallholder farmers in Rwanda, and Jamison, Karlan, and Zinman (2014) pair training with account access for Ugandan youth clubs (although the authors suggest that account access alone is a more cost-effective intervention than training).

Along with the increased focus on financial education, there is also mounting interest in improving access to formal savings institutions. In an ambitious strategy for financial inclusion, the government of India is pursuing a mission to ensure that every household in the country has at least one formal bank account. Thus far, the scheme has been credited with opening 250 million accounts for the low-income and unbanked individuals.¹ There are, indeed, some important advantages to formal banking. Unlike village savings programs, banks offer privacy from family members and other villagers, decreased risk of theft or default, and reliability. When financed by nongovernmental organizations or through government regulation, they can also be low cost or even free of any charges. Dupas and Robinson (2013a) find that in Kenya, for instance, giving female microenterprise owners access to such low-cost savings accounts increased savings, productive investment, and food expenditures. Similarly, Prina (2015) shows that in Nepal, giving female household heads access to bank accounts with no fees improved their overall financial situation.

¹ Pradhan Mantri Jan Dhan Yojana: <http://www.pmjdy.gov.in/account>.

Nevertheless, half of the world's adult population still do not use formal financial services to save or borrow (Global Findex Database).² Many of these people participate in other savings options, such as rotating savings and credit associations, although the majority do not opt for formal savings, perhaps because of the lack of knowledge about formal banking's benefits or the difficulty of access, since most banks are not near the poor and offer services that are not attractive to low-value depositors. Doorstep banking—also called last mile banking, where the bank reaches out to those who cannot make it to the banks—can often be found in local retail shops, through agents who live in or near the villages, or through mobile banking vehicles or mobile phones, such as those being pioneered by M-PESA and M-KESHO (Demombynes and Thegeya 2012). Doorstep banking makes it easier for people to handle formal savings accounts, although it is a new and still poorly understood idea.

In this study, we measure the impact of a financial education program on financial literacy and savings behavior of low-income households in Uttar Pradesh. The intervention consisted of a 2-day training delivered in a classroom setting among a random sample of 3,000 clients served by a doorstep banking facility. The training was delivered using a combination of different media, including printed materials (leaflets, comics) and audiovisual tools. The training also included skits, role playing, and classroom activities to engage participants. The contribution of this study is to explore the causal relationship between financial education and savings behavior when presented to people who have some experience with branchless banking.

The doorstep banking and financial literacy training intervention was conducted in cooperation with FINO Paytech Foundation (FINO), a private financial services and technology company based in India that specialized in delivering technology-based banking services. FINO works with financial institutions to enable the poor and unbanked to access financial services by offering last mile service delivery through a number of portable devices, including biometric smart cards, hand-held devices, and microdeposit machines with biometric authentication. The model that FINO employs to reach out to households in rural areas uses business correspondents, also known as *bandhus*, who in most instances are permanently based in the villages where FINO operates and serve as the contact person between the financial institution and community members. This model helps introduce the bank to the poor—who are usually not familiar or comfortable with the traditional banking institutions—through a more personal interaction. To date, FINO has trained more than 30,000 *bandhus*,

² Available at <http://datatopics.worldbank.org/financialinclusion/>.

servicing more than 77 million customers, and it is growing close to a million clients per month.³

While doorstep banking has had enormous success in expanding access—as many studies that look at the impact of branchless banking have shown—access in and of itself does not make individuals financially more aware or literate (India: Thyagarajan and Venkatesan 2008; Kenya: Dupas et al. 2014). For example, out of the sample of 3,000 individuals randomly drawn from FINO's administrative database who had signed up for a bank account served by FINO, we found that 88% made no transactions by the time of the study, with only 10% holding a positive savings balance.⁴ While many factors could account for this shortcoming—including lack of financial resources, effective access, and trust in branchless banking as well as individual biases—policymakers are concerned that low levels of financial literacy are a major constraint to the usage of such accounts (World Bank 2014).

We also implement a cross-experimental design where, in half of the treatment and control clients, a savings reminder was delivered through periodic phone calls and visits made by the agents of the branchless bank during the harvest season. The goal was to increase the salience of savings during a time when people might have more cash on hand and compare this with a simple, low-cost reminder.

One year after the training, we find that the financial education intervention had a significant impact on savings. Individuals who received the training saved in total Rs 2,648 (95% confidence interval [CI], 846–4,450; \$39, or 49%) more than the control group 1 year after receiving the training. Most of the effect comes from increased usage of formal savings in other bank accounts (notably so with the nationalized banks) and through a marginal increase in savings in the branchless banking account. The low levels of utilization of the branchless banking account may be due to low levels of trust in the branchless banking system, as we discuss below.

Increased savings appear to come in part from a decrease in temptation goods, while other spending, such as food consumption, remains unchanged. While this represents a relatively significant decrease in unnecessary spending, it does not account for all of the increases in savings we observe. We also find no

³ See http://www.finopaytech.com/images/FE_Banking_Special_March28.pdf and <http://www.moneycontrol.com/smentor/news/finance-capital/fino-taking-banks-to-indias-poor-766580.html>.

⁴ This is from administrative data shared by FINO. We believe this reflects the fact that bandhus received around Rs 20–25 for signing up each client and so had an incentive to sign up as many clients as possible, not just those with a strong interest in banking.

changes in income, and so we are not able to explain all of the observed savings effects.

Moreover, we find improvements on attitudes related to financial planning, but we do not find impact on financial knowledge or time preferences. These results suggest that financial education can expand savings outcomes, even if it does not affect overall financial literacy or deep preference parameters. Such findings are potentially in line with recent evidence shedding light on the constraints to formal savings in developing countries. For instance, Cole, Topalova, and Townsend (2014) suggest that attitudes and trust, together with a cumbersome regulation, are the major obstacles in India to the usage of mobile banking. Along the same lines, Dupas et al. (2014) maintain that lack of trust is the first reason justifying why people in rural Western Kenya did not begin saving in their bank account even when it was offered for free.

Different features of our financial literacy training might have contributed to its success, such as the delivery of simple and useful financial notions with real-life examples, the diffusion of information through a video, and the classroom setting that might have generated peer effects. For example, Drexler, Fischer, and Schoar (2014) showed that a rule of thumb training (i.e., teaching easily implemented decision rules without explaining the underlying concepts) for microentrepreneurs in the Dominican Republic improved business practices as compared with a control group that received a more complex accounting-based training. Along the same lines, Atkinson et al. (2013) test the effect of different types of financial offers to open a bank account on microfinance clients about to obtain a new loan. The authors show that clients who, during the offer, were told that the bank was going to set a monthly deposit target at 10% of the loan payment had higher savings 3 years later because the intervention eased the savings decision and provided useful information on what might be an optimal savings level. Similarly, Akbas et al. (2016) illustrate that in Kenya, giving clients of a savings plan a golden-colored coin with numbers to be scraped out each week to visualize and keep track of deposits was more effective for increasing savings than sending reminders or offering financial incentives. The authors argue that savings are abstract and it is hard to make sense of what are the implications of missing a deposit or what small deposits mean for a final goal. Also, results by Bernard et al. (2014) from an innovative experiment in rural Ethiopia suggest that poor people save more when their aspirations are improved by a documentary illustrating examples of successful people from similar communities.

We also find that the treatment effect does not come from changes in the doorstep banking account only but is driven mostly by increases in savings deposits in other banking institutions. The trainers employed for delivering the

intervention did not have strong incentives in encouraging subjects to save more in the doorstep accounts, and clearly the beneficiaries did not change their preference for other (more important) banking features just for the convenience offered by the doorstep account.

Finally, the results of the cross-cutting experiment were surprising. In the subsample of households given saving reminders, we find that only savings in the doorstep account offered by the branchless banking slightly increased, while there was no effect on overall savings. We speculate that the simple over-the-phone savings reminders are not as effective as the classroom sessions and thus had very little influence on overall saving behavior; this may be due to people becoming tired or suspicious of the constant reminders or spending the saved money more quickly than those who did not receive reminders before the endline data collection.

The rest of the paper is organized as follows. In Section II we discuss the program, experimental design, and primary outcomes of interest. In Section III we present the data that will be used in our analysis. In Section IV we discuss the results and then conclude with Section V.

II. The Training Program and Experimental Design

The program we evaluate here is a financial literacy training program implemented by the FINO Paytech Foundation (FINO), a branchless banking program located throughout India. The trainings were administered by FINO employees, specifically the bandhus that FINO employs. In most cases, the bandhus were the residents of the village served by FINO. In some instances, the service areas covered by a bandhu included more than one adjacent villages. According to their program model, FINO bandhus were supposed to visit the client households regularly so that clients can conduct transactions at their doorstep. However, because of very poor remuneration and incentive structures, in most cases bandhus were also doing other work, such as running local grocery stores or serving as agents of other businesses, and thus were working with FINO only on a part-time basis. Our observations suggest that most of the bandhus did not regularly visit the client households, and thus obtaining access to the bandhu was difficult for many clients. Our endline data indicate that 75% of the clients did not receive any visit from a bandhu in the 3-month period before the endline. In other instances, the handheld point of sale machines used for transaction were out of service because of technical issues limiting bandhu's ability to undertake transactions.

The intervention is a 2-day financial education training program and was implemented by FINO between May and August 2011 across two adjacent districts of the state of Uttar Pradesh. The clients randomly selected to the

treatment group were invited and encouraged to attend the training and were provided no financial incentives.

Table 1 illustrates the contents covered by the training. The intervention used a classroom setting to discuss key financial literacy topics with a combination of methods, including the use of flipcharts, role plays, and customized videos. It focused on providing comprehensive lessons to show how to prepare for a financially secure future and improve financial well-being. It broadly described the steps involved in designing the savings and borrowing strategies that can help in getting started on the path to financial responsibility. Toward that objective, the intervention focused on four major sections: the concept of financial planning and budgeting, the importance of savings, smart borrowing practices, and the importance of insurance in risk mitigation. The intervention staff also handed out leaflets to the beneficiaries with concise summaries of the lessons learned, focusing on how various formal financial instruments

TABLE 1
CONTENT OF THE FINANCIAL EDUCATION TRAINING

Training Module	Contents	Methodology
Financial planning and budgeting	Discussion about session objective Instruction on how to keep track of income and expenses Creation of personal budget and its categories Allocation of income among budget categories	Discussion, pamphlets, storytelling
Saving and investment	Importance of regular saving Difference between savings and investments Importance of saving account and different avenues of saving Long-term saving and planning for major future event Different avenues of investment	Video, comics, storytelling, leaflets
Borrowing and loan management	Concepts of wise borrowing Different avenues of borrowing Planning personal loan management Planning for emergency needs to avoid overindebtedness	Video, comics, storytelling, leaflets
Mitigating risk and insurance	Meaning and usefulness of insurance Discussion of different insurance products Pension planning or target segments	Video, comics, storytelling, leaflets
Formal financial services know-how	Basic know-how about banking and allied services Need for including oneself in formal financial system	Video, group discussion, leaflets

can be used for improving financial well-being. The contents of the major modules are described below.

A. Financial Planning and Budgeting

This module introduced the concept of financial planning and explained the various factors that need to be included in a financial plan. It provided examples of common life-cycle goals (including short-term, medium-term, and long-term goals) and focused on the need for planning expenses for achieving these goals. The module emphasized the importance of identifying and minimizing superfluous expenses that can release funds for building up savings and, therefore, achieving fixed goals. It also described the constituents of a budget and provided examples to demonstrate how a deficit budget can be converted into a surplus budget by cutting down superfluous expenses.

B. Importance of Savings

This module stressed the importance of savings, especially the fundamental facts to be considered while saving (such as the importance of saving regularly in a formal bank account for managing future unforeseen needs). It described how small and disciplined savings can help to achieve one's goals. It used a graph to demonstrate how the mismatch between income and expenses due to uneven and lumpy life-cycle events can jeopardize financial future and lead to a poverty trap. It then emphasized the importance of wise cash management and savings by using a hypothetical scenario and comparing the financial outcomes of a person who can smooth income and expenses by means of regular savings and insurance products with the outcome experienced by a person who does not save regularly and does not use any insurance to mitigate risk. The module also demonstrated the importance of saving early by projecting how the same amount of regular savings in a formal instrument at different starting points in time can result in a difference in the amount accumulated at retirement age. It also explained the importance of investing surplus into savings instruments that offer compound interest by showing how the same amount of initial savings can lead to a large difference in accumulated savings under compound interest as compared with simple interest.

C. Smart Borrowing

This module described the difference between desire and need, secure and unsecure loans, or productive and unproductive loans. It explained how an unproductive loan can lead to an accumulation of debt and, eventually, a debt trap. It described the importance of borrowing from formal sources to avoid falling into a debt trap that often arises when borrowing from informal lend-

ers, who offer high interest rates and enforce nontransparent terms and conditions while providing easy access to loans. It also pointed out various factors that need to be considered before taking a loan, such as the repayment capacity, the interest rate, and the type of interest.

D. Insurance and Risk Mitigation

This module described the various types of risk that a household can face in daily life and introduced the concept of risk mitigation through insurance products. Using some examples, it explained how typical insurance products work and the usefulness of various popular insurance products. The intervention also described the concept of transferring money using a formal payment system, presented various ways to transfer money, and highlighted the usefulness of a formal money transfer.

It is possible that the close collaboration between the banking and training staff contributed, at least in part, to the effects we find here. The FINO name is well known in the communities under study. While community members have reported trust issues with the FINO agents, mostly around a lack of access to the agent as often as promised, community members are aware of what FINO does and how formal banking generally works. In addition, because the FINO agents were also present during the financial literacy training, it is possible that they might have helped strengthening the effect of classroom training by reminding the clients about the importance of savings during their regular interaction with the clients in the postintervention period. We are thus working with a sample that has a broad experience with banking and possibly access to regular financial advice communicated through the agents.

The program was rolled out with the clients of 200 bandhus who were working in the villages of the two experiment districts of Varanasi and Azamgarh in the state of Uttar Pradesh. These bandhus were selected from the list of all FINO agents using a distance-based dropping method to prevent contamination between treatment and control groups. From a pair of bandhus who were located in villages very close to each other (less than 1.25 kilometers), the evaluation team randomly dropped one bandhu to minimize spillovers, and it also dropped bandhus whose own service areas were far apart (more than 10 kilometers) in order to make data collection and training easier. We then randomly assigned these 200 bandhus into treatment and control, and for each bandhu, 25 clients were randomly selected through FINO's client records, updated in January 2011. Using these FINO records, prebaseline randomization tests were performed to ensure that the sample was well balanced with respect to available demographic and account activity information. The results of the balance test showed that before the baseline, there were indeed no observable

differences between treatment and control FINO clients.⁵ Finally, from the list of 25 clients, we drew a sample of 15 clients per bandhu for the survey interview.⁶ So, in total, we selected 3,000 households for the baseline survey, which took place in April 2011, while the endline survey was conducted 1 year later, in April 2012. Around November 2011, the sample was further divided, assigning half of the treatment and half of the control to receive the postharvest intervention (house visit and reminder phone calls), and as a result, four groups were formed: pure control, pure treatment, only postharvest intervention, and treatment plus postharvest intervention.

As in other similar studies, we did not have full treatment compliance. Defining a client as having attended the program if he or she attended the training session for at least 1 hour, training attendance was irregular, with only 80% of the invited ever attending a training session. In the appendix, available online, we present a list of baseline characteristics that might have influenced attendance status in the treatment group. There are no noticeable differences in savings or financial literacy levels between those who attended and those who were offered the training but did not attend. Also, clients who attended seem to be more likely female and of older age.

We are interested in two primary outcomes: (1) the impact of the financial education training on savings rates and (2) the impact of the financial education training on budgeting skills and financial knowledge and attitudes. The breakdown of the analysis in these two dimensions will allow us to examine in more depth the impact of the intervention along the variables in the causal chain.

Furthermore, in order to understand whether there might be alternative and more cost-effective ways to deliver the message that saving is important, we try to investigate which elements are required for the success of the program. For this purpose, we introduced a cross-cutting intervention consisting of simple 10-minute house visits to stress the importance of saving in formal instruments during the postharvest period (when people have more money), followed up by monthly 5-minute phone conversations to remind people to save for a period of three consecutive months. Besides highlighting the importance of savings and the benefits of formal savings, this postharvest interven-

⁵ The variables included in the prebaseline balance test were percentage of females; share of clients in the age groups 18–24, 25–59, and 60 and older; and share of clients who made at least one transaction in the 6 months period before February 2011.

⁶ Buffers of 10 clients per bandhu were kept to ensure that, for each bandhu, the target of 15 clients could be surveyed. The first 15 clients (based on the sorting of randomly assigned client ids) per bandhu were treated as the priority and the buffer used only in the extreme case, where, in spite of making every effort, the survey team was unable to find the client from the original list.

tion also included the setting of saving goals and the delivery of information about expected dates of bandhu presence in the area. Hence, we test whether a simple intervention is as effective as the classroom financial literacy training, and we also check whether the postharvest reminders can leverage the effect of the training.

III. Data

A. Baseline Values

In table 2, we present descriptive information to show how rural households in our sample saved money at the time of the baseline survey. To estimate savings, we rely on self-reported data, that is, the respondents' recall of the balance amount in each formal account and informal savings tool.

In April 2011, mean formal savings were Rs 4,376 (\$51), or about twice the average monthly income, while mean informal savings (mostly home savings or savings in self-help groups) amounted to only Rs 619, showing that in our sample, formal savings are more prevalent than informal savings. Even though technically the entire sample had a no-frills savings account served by

TABLE 2
DESCRIPTIVE STATISTICS ON HOUSEHOLD SAVINGS

	Values	Observations
Formal savings:		
Amount of formal savings	4,376	2,926
Has a formal savings account (dummy)	.94	2,926
Amount of formal savings (for those who have at least an account)	4,649	2,754
Amount of formal savings (for those who keep a nonzero balance)	7,376	1,736
Has a FINO account (dummy)	.87	2,926
Amount in FINO account (for those who have it)	569	2,457
Amount in FINO account (for those who keep a nonzero balance)	1,984	704
Has a formal savings account other than FINO (dummy)	.57	2,926
Amount of other formal savings (for those with a nonzero balance)	8,292	1,389
Has an account in a nationalized bank (dummy)	.51	2,926
Has an account with a post office (dummy)	.06	2,926
Has an account in a private bank (dummy)	.05	2,926
Has an account with an NGO (dummy)	.02	2,926
Has an account in a chit fund (dummy)	.01	2,926
Has an account in a nonbanking financial company (dummy)	.01	2,926
Informal savings:		
Amount of informal savings	619	2,928
Has an informal savings device (dummy)	.28	2,928
Has savings at home (dummy)	.23	2,928
Has savings with a self-help group (dummy)	.02	2,928
Has savings with a neighbor (dummy)	.02	2,928
Has savings with a friend (dummy)	.01	2,928
Has savings with a shopkeeper (dummy)	.01	2,928
Has other informal savings (dummy)	.01	2,928

Note. Baseline values. Monetary amounts are in Indian Rupees (Rs). NGO, nongovernmental organization.

FINO, only 87% of households reported having an account through FINO, suggesting that some clients were either not aware they had FINO accounts or did not understand what they were signing up for when they opened the account.⁷

Noticeably, even though about 94% of households reported having a formal savings account at the baseline, only 59% had a nonzero balance, suggesting that other constraints than access to bank services limited savings amounts. Considering only FINO accounts, the percentage is even lower: only 24% of households appeared to use the account for savings by keeping a nonzero balance.⁸ Such baseline levels indeed present a potential scope for financial education training to help develop better savings behaviors.

Further, almost 60% of FINO account holders also had at least one other formal savings account. About 51% had an account in a nationalized bank, 6% in a post office, 5% in a private bank, and only 2% with a nongovernmental organization (categories not mutually exclusive). This picture is similar to the percentages presented by Demirguc-Kunt and Klapper (2012) based on the nationally representative Global Findex data set in India. They showed that in 2011, between 22% and 56% of the population (exact percentages depending on the income quintile) had an account at a formal financial institution. The fact that half of the respondents had a national bank account suggests that while banking may be difficult, considered unimportant, or expensive in the areas where FINO operates, people are interested in obtaining formal savings despite the extra costs. This finding also reflects that in 2006 the Reserve Bank of India imposed on all commercial banks the introduction of free no-frills accounts, which allow for only savings and do not offer interest rate returns, loans, or other banking services (Thyagarajan and Venkatesan 2008). Thus, in the study area, the extra cost of keeping another formal account consisted mostly in the traveling cost of reaching the nearest bank.⁹

To define our indicator of financial literacy, we follow the approach introduced by Cole et al. (2011) and Carpena et al. (2011). The first paper presents the first nationally representative measure of financial literacy in a developing country, while the second study identifies three distinct dimensions of finan-

⁷ The no-frills savings accounts are the bank accounts introduced by the Reserve Bank of India to cater to the banking needs of low-income households by offering mostly deposit and withdrawal facilities, with some restrictions on the number of free withdrawals and no or very limited additional features (e.g., internet banking).

⁸ The low deposit in FINO accounts might have been aggravated by the problem of absence of *bandhus* in the areas and/or by trust issues.

⁹ FINO estimated that in the villages where it chose to operate, a bank branch was at least 4–5 kilometers away.

cial knowledge: financial numeracy, basic awareness of financial choices, and attitudes toward financial decisions. Accordingly, our questionnaire covered different aspects of financial literacy, including budgeting skills, interest in financial matters, basic financial numeracy, financial products' awareness, and financial attitudes.

More specifically, budgeting quality refers to the skills of making a budget, writing it down, evaluating it as helpful, and being able to stick to it. Interest in financial matters covers responses regarding involvement in household financial matters and self-assessed understanding of information related to financial products. Table A2 (tables A1–A9 are available online) presents the summary statistics for these first two measures of financial literacy. In the baseline, budgeting quality appeared to be particularly low: 73% of the respondents did not make a budget, and even when they did, they mostly kept it only mentally. A considerable fraction of individuals (24%) also reported not to be involved at all in financial matters and not to be actively interested in financial topics (48%). When asked about their understanding of financial product, almost half of the respondents stated that, in general, they rarely or never understood financial information, especially on loan and savings products. Even though these percentages might not represent a particularly alarming picture, they still signal a generalized lack of financial understanding and involvement.

Table 3 presents the descriptive statistics regarding financial knowledge and compares our results with the findings of Cole et al. (2011) from rural India and Indonesia and of Carpena et al. (2011) from urban India. The first measure of financial numeracy is based on the study by Cole et al. (2011), which is in turn very close to the work of Lusardi and Mitchell (2006), who pioneered the quantitative research on financial literacy. It includes a question on compound interest along with one on interest rates versus inflation.¹⁰ The main purpose of these questions is to test respondents' understanding of basic economic concepts (i.e., inflation, interest rate, and compound interest), which are considered indispensable for making financial decisions. For this reason, we rename our measure of financial numeracy as understanding of basic economic concepts. Our indicator appears to be in line with previous estimations: in our sample, the mean share of correct answers is 71%, while it was 70% in the Cole et al. (2011) sample representative of Indonesian population and 42% in the Cole et al. (2011) sample of 1,500 poor households in rural Gujarat. Thus, our sample is more comparable with average samples in other developing countries than with Indian subsamples of poorer laborers in subsistence agriculture. It is possible that our sample is different from the Cole et al.

¹⁰ For details, see table A3.

TABLE 3
DESCRIPTIVE STATISTICS AND COMPARABILITY OF OUR MEASURES OF FINANCIAL KNOWLEDGE

	Understanding of Basic Economic Concepts		
	Our Sample	Cole et al. (2011) Sample from Rural India	Cole et al. (2011) Sample from Indonesia
Compound interest:			
Correct (%)	70	59	78
Do not know (%)	15	30	15
Interest rate vs. inflation:			
Correct (%)	71	25	61
Do not know (%)	11	38	16
Both questions:			
Correct on average (%)	71	42	70
Observations	2,931	1,496	3,360
	Financial Awareness		
	Our Sample	Cole et al. (2011) Sample from Rural India	Cole et al. (2011) Sample from Indonesia
Is one crop safer than multiple crops?			
Correct (%)	31	31	28
Do not know (%)	8	6	4
Observations	2,931	1,496	3,360
	Mean in Carpena et al. (2011)		
	Mean in Our Sample	Pure Control from Urban India	
Knows to include both income and expenses in household budget	.77	.85	
Knows will get money back if bank closes	.32	.70	
Knows borrowing money for Diwali is unproductive loan	.70	.62	
All questions, on average	.58	.72	
Observations	2,851	221	
	Financial Attitudes		
	Mean in Our Sample	Mean in Carpena et al. (2011) Pure Control from Urban India	
Advice to construction worker	.66	.81	
Advice to friend with bright child	.77	.93	
Advice to auto driver about loans	.40	.92	
Advice about buying a television	.84	.95	
All question, on average	.68	.90	
Observations	2,901	221	

(2011) sample of 1,500 poor households in rural Gujarat who were predominantly poor subsistence agricultural laborers (selected for an intervention with a weather insurance product), while only 16% of the clients in our sample were unskilled casual laborers. In addition, households in our sample al-

ready have savings accounts and also received some exposure to formal financial products from FINO agents who serve as a source of information.

Second, to define basic awareness of financial choices, we follow Carpena et al. (2011, 13–14), who define this indicator as the “knowledge of fundamental financial planning concepts, as well as details of financial products, [such as] understanding of deposit insurance or of the purpose of a household budget.”¹¹ In this case, because the comparison is with a subsample from urban India, the means in our sample variables are on average lower, especially for more complicated concepts as the one of deposit insurance.

Finally, financial attitudes are also measured (as in Carpena et al. 2011) by presenting hypothetical situations to respondents and asking them about the financial products or financial advice they would suggest in the given scenario.¹² Some of these questions have an ascending range of correct answers, so they are coded as continuous variables from 0 to 1, with 1 equal to the best financial option and 0.5 weight on the second-best option. Again, with a mean of 0.68, our measure of financial attitudes is on average lower than the one presented by Carpena et al. (2011). This indicator of financial attitudes can also be interpreted as a measure of applied financial knowledge because the questions included deal with real-life situations, where one could use in practice his/her financial understanding to suggest, for instance, an appropriate financial product to someone who is worried about meeting expenses if sick (Doi, McKenzie, and Zia 2014). It could also be interpreted, though, as a proxy for hypothetical (unconstrained) financial choices.

B. Socioeconomic Background of the Clients and Balance Test

Respondents in our sample are of relatively low socioeconomic status. Household heads are mostly male, 45 years old, and about 40% are illiterate. Households are mostly Hindu and have on average six to seven members, four of whom are adults. About 70% of the households own land, with income from harvest contributing to roughly one-fourth of the total income. The mean of the total household income was about the same as the mean of total household expenditures, suggesting that on average households did not manage to save much. In fact, about 10% of them had an outstanding loan.

Table 4 presents the results of the balance test relative to all the basic household characteristics. Most of the measures are well balanced at baseline. The rate of those that are not is less than the rate that is expected by chance. In

¹¹ For details, see table A3.

¹² For details, see table A3.

TABLE 4
SAMPLE CHARACTERISTICS AND BALANCE TEST

	Control	Only Postharvest Reminder	Only Treatment	Treatment and Postharvest Reminder
HH head is male	.71	.71 (.893)	.73 (.444)	.72 (.721)
Age of HH head	44.86	44.44 (.564)	44.93 (.774)	46.23 (.237)
HH head is illiterate (dummy)	.39	.38 (.860)	.39 (.748)	.41 (.361)
HH head has secondary education (dummy)	.28	.26 (.562)	.21** (.0263)	.22** (.0272)
Religion is Hindu (dummy)	.93	.97* (.0780)	.94 (.574)	.95 (.538)
Total number of members in HH	6.87	6.64 (.266)	6.91 (.830)	7.03 (.448)
Total number of adults (≥18)	4.14	3.93* (.0886)	4.08 (.634)	4.14 (.999)
Owens land (dummy)	.71	.71 (.877)	.68 (.646)	.72 (.709)
HH income from harvest	364.77	566.71 (.247)	416.91 (.493)	279.52 (.407)
Total HH income	1,691.93	1,734.04 (.973)	1,461.63 (.338)	1,552.56 (.493)
Food consumption	1,563.42	1,471.13 (.158)	1,461.25 (.219)	1,458.73 (.153)
Food consumed outside home	24.99	32.74 (.179)	25.73 (.934)	21.89 (.574)
Cigarette, tobacco, beetle nut, alcohol	68.01	58.78 (.262)	54.22* (.0653)	56.43 (.122)
Total consumption	1,637.94	1,546.31 (.180)	1,529.40 (.199)	1,510.18 (.102)
Has an outstanding loan	.10	.08* (.0873)	.12 (.369)	.12 (.447)
Total outstanding loan amount	4,863.71	3,208.03** (.0343)	4,307.55 (.473)	4,429.17 (.591)
FINO savings	336.53	309.27 (.734)	364.91 (.756)	230.40 (.255)
Non-FINO formal savings	2,461.53	2,031.16 (.326)	2,089.95 (.441)	2,269.35 (.671)
Informal savings	288.04	386.85 (.265)	385.23 (.355)	309.64 (.787)
Total savings	3,255.58	2,815.88 (.354)	2,960.63 (.598)	2,942.81 (.567)
Budgeting quality	.34	.23** (.0145)	.26 (.0924)	.26 (.0950)
Interest in financial matters	.46	.42* (.0855)	.41 (.0153)	.41** (.0241)
Basic economics understanding	.85	.81 (.184)	.78*** (.00740)	.81 (.141)
Financial awareness	.58	.57 (.603)	.56 (.158)	.55 (.0608)
Financial attitudes	.78	.77 (.804)	.76 (.236)	.75 (.105)
Discount rate or index of time preferences	2.84	2.82 (.825)	2.91 (.480)	2.80 (.713)

Note. Baseline values. Values are group means, with *p*-values of regressions of the relative treatment dummies in parentheses. Monetary amounts are in Indian Rupees (Rs) capped at the 99th percentile. HH, household.

* *p* < 0.1.

** *p* < 0.05.

*** *p* < 0.01.

order to avoid any bias that might arise in estimating treatment effects, we include all unbalanced variables as controls in the empirical analysis.¹³

C. Endline Data Collection

The endline survey was administered in May–July 2012. It collected data on household behavior and respondents' financial well-being after the intervention. It covered information on basic household demographics; household assets, monthly income, and expenditure; household savings and indebtedness; respondents' money management and budgeting skills; respondents' financial knowledge and understanding of financial matters; respondents' time preference; and clients' experience with FINO services.

To minimize attrition, the survey team undertook a rigorous search for tracking back the baseline sample (including pre-endline house visits) and, in some cases, used the help of the bandhus to relocate the households. These efforts ensured a low attrition rate: attrition was only 2.8% and 2.1%, respectively, in the comparison and treatment groups. In Varanasi, out of 1,620 baseline households (including 840 treatment and 780 control clients), 1,599 households were revisited at the endline (of which 833 were treatment and 766 were control clients). In Azamgarh, out of 1,380 baseline households (including 720 treatment and 660 control clients), 1,332 households were revisited at the endline (of which 639 were treatment and 693 were control clients).¹⁴ Furthermore, the baseline characteristics of households that left the sample were similar in the treatment and comparison groups, suggesting that the factors leading to attrition were the same and, consequently, that attrition and treatment status were unrelated. Therefore, attrition is unlikely to be a problem in our estimation strategy.

IV. Impacts on Savings and Financial Literacy

A. Estimation Method

For our estimation, we employ an ANCOVA specification, which has been shown to be the most efficient method in cases with one baseline and one endline data collection (Bruhn and McKenzie 2009; McKenzie 2012).¹⁵ In

¹³ Variables unbalanced at baseline are whether the client has at least secondary education, whether the client had a loan, the number of females in the household, whether the client had a non-FINO bank account, and the level of overall financial literacy. These variables are included as controls in all regressions.

¹⁴ Migration and death of baseline clients were the main drivers of attrition at the endline. Out of a total of 63 baseline households that could not be surveyed, 37 households migrated, 19 clients died, and the rest refused to participate.

¹⁵ As a robustness check, we also replicated the estimation regressing the change in the outcome indicator (postintervention value in levels minus preintervention value in levels) on the treatment status, controlling for the baseline value of the indicator (as in Banerjee et al. 2007). Such a robustness

the case of monetary outcomes such as savings, consumption, and loans, we regress the outcome indicator on a series of treatment status dummies for household h , controlling for the baseline value of the indicator:

$$Y_{b \text{ Post}} = \alpha + \beta_1 T_1 + \beta_2 T_2 + \beta_3 T_3 + \eta Y_{b \text{ Pre}} + \delta X_{b \text{ Pre}} + \varepsilon_{b \text{ Post}}, \quad (1)$$

where X represents household control variables unbalanced at the baseline and standard errors are adjusted for clustering at the bandhu level. T_1 is a dummy variable equal to 1 if a household was selected to receive only the financial training session and 0 otherwise. T_2 refers to the combined intervention and is 1 if the household was assigned to receive both the training and the postharvest reminders and 0 otherwise. T_3 is a dummy equal to 1 if the household received only the postharvest reminders and 0 otherwise. The effect of pure treatment (i.e., the training) is estimated by β_1 , while β_2 represents the combined effect of training and postharvest reminders, and β_3 estimates the effect of postharvest reminders only. In some cases, such as financial literacy, because the postharvest intervention was not designed to provide additional financial education or other information, we also regress the outcome indicator on the treatment status of household h , controlling for the baseline value of the indicator:

$$Y_{b \text{ Post}} = \alpha + \beta T_b + \eta Y_{b \text{ Pre}} + \delta X_{b \text{ Pre}} + \varepsilon_{b \text{ Post}}, \quad (2)$$

where T is a dummy variable equal to 1 if the household was assigned to receive the training session and 0 otherwise.

Finally, there may be concern that we test a large number of outcomes simultaneously. We therefore calculate the family-wise error rate (FWER), that is, the probability that at least one hypothesis out of a family of hypotheses is falsely rejected (type I error). The FWER results are introduced to account for the multiple inference problem, which increases the likelihood that some of the outcomes are statistically significant by chance, even if there is no treatment effect. Following the definition, we present the FWER estimates only where we increased the number of outcomes artificially by breaking down a main outcome into multiple outcomes (as in tables 6–8) or by looking at secondary outcomes, such as assets (bought and sold), loans, and income (as in table 9). We estimate the FWER using the Westfall and Young (1993) stepdown resampling algorithm summarized by Anderson (2008), with 100,000 replications per family (as in Liebman and Luttmer 2015). In this case, we prefer the following

check gave similar results confirming the validity of our estimates. We also conducted an instrumental variables test to obtain the treatment on the treated effect (which is the local average treatment effect) and found consistent results.

ordinary least squares specification that regresses all the outcome indicators against the same set of controls:

$$Y_{b \text{ Post}} = \alpha + \beta T_b + \delta X_{b \text{ Pre}} + \varepsilon_{b \text{ Post}} \quad (3)$$

B. Estimates of the Average Impacts on Savings

In table 5, we look at the average impacts of the financial education intervention and postharvest reminders on savings behavior. In columns 1–5, we explore the effect on the FINO savings account only; total formal savings without the FINO account; total informal savings; total cash savings, which includes both formal and informal savings; and finally total cash and asset savings, which is a combination of column 4 with the total value of assets bought in the last year. All savings amounts are top coded at the 99th percentile in

TABLE 5
AVERAGE IMPACTS OF TREATMENT AND POSTHARVEST REMINDERS ON SAVINGS

	FINO Savings (1)	Non-FINO Formal Savings (2)	Non-FINO Informal Savings (3)	Total Formal Savings (4)	Total Savings Including Formal Savings and Assets (5)
A. Intention-to-Treat Estimates					
Only treatment	65.9** (31.48)	2,617*** (904.1)	−22.08 (69.34)	2,648*** (914.0)	4,690.2*** (1,363.4)
Treatment and post-harvest reminder	122.1** (48.47)	1,146 (812.4)	19.0 (77.52)	1,334 (828.2)	3,861** (1,494.1)
Only postharvest reminder	8.06 (25.11)	838.5 (804.6)	21.23 (67.34)	869.4 (814.3)	2,182.9* (1,393.4)
Observations	2,666	2,916	2,918	2,919	2,919
R ²	.02	.07	.02	.07	.08
Mean of endline variable in control group	85.8	4,940.27	372.08	5,415.55	10,793.71
B. FWER Estimates					
Intention-to-treat estimates	94.2	1,426.93	−12.06		
p	.001***	.014**	.805		
p FWER	.003***	.029**	.806		
Observations	2,699	2,867	2,867		
R ²	.02	.12	.03		

Note. Standard errors are clustered at the agent/village level. Controls include the baseline values of the dependent variable and all the variables unbalanced at the baseline: whether the client has at least secondary education, whether the client had a loan, the number of females in the household, whether the client had a non-FINO bank account, and the level of overall financial literacy. In panel B, controls also include baseline total cash savings, consumption, loans, and monthly income. FWER, family-wise error rate.

* $p < 0.1$.

** $p < 0.05$.

*** $p < 0.01$.

order to eliminate outliers. The measure of assets includes the self-reported value of land the individual has bought, livestock, gold and silver, farm and business equipment, vehicles, and other small household assets. We report all of these different measures of savings, although our preferred outcome is the total cash and assets because assets are a common way of saving money in Uttar Pradesh.

We find that there was a modest increase in total savings in the FINO account for the training of Rs 66 (95% CI, 4–128). While this is in absolute terms a very small amount, it represents a significant increase over the control value of Rs 86. Combining training with the postharvest reminder doubles this effect. However, only postharvest reminders have no effects.

Columns 2 shows that there is a statistically significant and large positive effect on non-FINO formal savings of Rs 2,617, which is an effect of approximately 53% over the control mean. The majority of this effect comes from savings in the nationalized banks. Combining the training with the postharvest reminders does not produce a significant effect, although the coefficient size is large. This suggests that not only did the postharvest reminder fail to increase savings, but also it actually decreased overall savings.

We find no effect on informal savings in column 3. Column 4, which presents the impact on formal savings accounts (including FINO and non-FINO accounts), shows that training increases formal financial savings by Rs 2,648 (95% CI, 846–4,450), or \$39 (a 49% increase over the control mean). However, there was no impact from combining training with the postharvest reminder or the postharvest reminder alone.

Finally, in column 5 we combine column 4 with reported spending on assets. Purchasing assets is a common form of savings in India, especially precious metals. We find a very large and significant effect from the training of Rs 4,690 (a 43% increase over the control mean). The effect from combining training with the postharvest reminder is small but not statistically different from the training only effect. We also find a significant effect for the postharvest reminders, although this is half the size of the training effect.

C. Estimates of the Average Impacts on Financial Literacy

Table 6 illustrates the average impacts of the financial education intervention on changes in the different aspects of financial literacy (using standardized indicators) and shows that the only dimension of financial literacy that appears to have been positively affected by the treatment is financial attitudes.¹⁶ The

¹⁶ Normalized scores for each dimension of financial literacy are calculated like school test scores by first summing the results of each question belonging to that dimension and then standardizing by

TABLE 6
AVERAGE IMPACTS ON FINANCIAL LITERACY USING STANDARDIZED INDICATORS

	Budgeting Quality (1)	Interest in Financial Matters (2)	Economic Understanding (3)	Financial Awareness (4)	Financial Attitudes (5)	Financial Knowledge Targeted by the Intervention (6)
A. Intention-to-Treat Estimates						
Treatment	.066 (.13)	.068 (.06)	.052 (.04)	.03 (.04)	.09** (.04)	.071 (.05)
Observations	2,921	2,921	2,921	2,921	2,921	2,921
R ²	.08	.01	.04	.03	.02	.03
Mean of endline variable in control group	1.25	2.4	1.24	2.23	2.26	3.9
B. FWER Estimates						
Intention-to-treat estimates	.021	.076	.048	.02	.086	
p	.866	.234	.185	.570	.034**	
p FWER	.866	.551	.551	.815	.156	
Observations	2,867	2,867	2,867	2,867	2,867	
R ²	.08	.01	.04	.04	.04	

Note. Standard errors are clustered at the agent/village level. Controls include the baseline values of the dependent variable and all the variables unbalanced at the baseline: whether the client has at least secondary education, whether the client had a loan, the number of females in the household, whether the client had a non-FINO bank account, and the level of overall financial literacy. In panel B, controls also include baseline total cash savings, consumption, loans, and monthly income. FWER, family-wise error rate. ** $p < 0.05$.

ITT estimates show that the intervention changed the average score for financial attitudes of individuals in the treatment group by 0.09 standard deviations (95% CI, 0.01–0.17), or 4%.

This result is somewhat in line with what was previously found in the literature and, in particular, can be related to the conclusions of Carpena et al. (2011) that highlighted positive effects of financial literacy on financial attitudes and basic financial awareness. The exception is that our intervention did not seem to have any effect on financial awareness. However, this may be due to various reasons that might not ensure comparability of the results. First, the survey was answered by the FINO client only when he/she was available and, in the remaining cases, by the other most knowledgeable person in the household. Therefore, we repeat the estimation on the restricted sample of clients who responded to both the baseline and the endline surveys because, even though this might be a selected sample, we need to check whether the absence of a significant impact on financial knowledge can be attributed to attrition bias.

subtracting the mean preintervention score of the comparison group and dividing by the standard deviation of the preintervention scores of the comparison group (as in Banerjee et al. 2007).

As shown in table A4, the new results confirm our previous findings, and as before, the only significant treatment coefficient is the one on financial attitudes, but the magnitude of the impact is now higher. It could also be because our financial education training was tailored differently than previously evaluated financial education programs, as it was more focused on increasing savings and less oriented toward changing financial knowledge. In fact, even restricting the measure of financial knowledge to include only the questions that must have been well underlined in the training does not modify our results (col. 6 of tables 6, A4).¹⁷

Our findings are also similar to the results of Doi et al. (2014), who found a positive and significant effect of financial education on financial attitudes and financial awareness, but they use an indicator of awareness that is more relaxed than other measures of financial knowledge. They assess it by asking respondents only whether they have heard about different financial products.

Thus, the point estimate of the effect on financial attitude is somewhat consistent with the findings of Carpena et al. (2011) and Doi et al. (2014). However, given the small effect size (4%) and multiple comparisons' results, we do not believe that this effect is meaningful.¹⁸

D. Estimates of the Average Impacts on Household Consumption and Welfare

Table 7 shows the average impacts of the financial literacy training on consumption. We do not find significant effects on spending on food, but we do find that individuals in the treatment group decreased their expenses on temptation goods such as cigarettes, tobacco, beetle nuts, and alcohol. This effect is statistically significant and corresponds to an economically modest decrease of approximately \$0.50 biweekly.¹⁹ Nonetheless, it is a remarkable finding, and the low magnitude might be due to general underreporting of tobacco and alcohol expenses. Such a result suggests that the intervention was

¹⁷ We include in this indicator the following questions: question 2 on financial numeracy; questions 1, 2, and 4 on financial awareness; and questions 1 and 4 on financial attitudes. Thus, we exclude the following questions: question 1 on financial numeracy, because it involves numerical skills that the training did not cover; question 3 on financial awareness, because it deals with the concept of deposit insurance that was not explicitly included in the training program; and questions 2 and 3 on financial attitudes, because they are framed in a very subjective way (for detailed list of questions, see appendix).

¹⁸ When we account for the multiplicity of outcomes across families and calculate the FWER p -values (reported in panel B of table 6), we could not reject the null hypothesis of no impact of financial literacy on financial attitudes.

¹⁹ The treatment effect on temptation good expenses for the past 14 days is Rs 25. If this effect were constant over time, on average the total treatment effect for the whole year would be equal to $(25/14) \times 365 = \text{Rs } 652$, or about 24% of the treatment effect on cash savings. It is possible that other changes in consumption in the last year that we cannot observe account for the remaining savings.

TABLE 7
AVERAGE IMPACTS ON CONSUMPTION

	Food Consumption (1)	Food Consumed Outside Home (2)	Cigarette, Tobacco, Beetle Nut, Alcohol (3)	Total Consumption (4)
A. Intention-to-Treat Estimates				
Only treatment	76.53 (61.23)	-3.89 (19.69)	-25.20** (12.10)	57.65 (78.72)
Treatment and postharvest reminder	56.59 (66.36)	-30.24 (19.26)	-29.28** (12.77)	-12.25 (85.36)
Only postharvest reminder	23.49 (71.68)	-.48 (23.95)	-17.01 (13.04)	8.1 (93.44)
Observations	2,850	2,829	2,842	2,885
R ²	.07	.03	.03	.07
Mean of endline variable in control group	1,530.96	206.36	145.11	1,878.60
B. FWER Estimates				
Intention-to-treat estimates	41.72	-17.67	-20.25	
p	.379	.259	.034**	
p FWER	.436	.436	.093*	
Observations	2,864	2,841	2,839	
R ²	.09	.05	.02	

Note. Standard errors are clustered at the agent/village level. Controls include the baseline values of the dependent variable and all the variables unbalanced at the baseline: whether the client has at least secondary education, whether the client had a loan, the number of females in the household, whether the client had a non-FINO bank account, and the level of overall financial literacy. In panel B, controls also include baseline total cash savings, consumption, loans, and monthly income. FWER, family-wise error rate.

* $p < 0.1$.

** $p < 0.05$.

successful in increasing savings at least in part through boosting commitment to save and changing money management. We do not find any effects on total consumption, however, because of the large but insignificant coefficient on food consumption.

We conclude our analysis of the effects on household welfare by illustrating the average impacts of the intervention on assets, loans, and income (table 8). Clients were asked whether they bought or sold different types of assets, including land and livestock, gold and silver, farm equipment, vehicles, and other assets.

We find no significant effects on assets sold after the intervention and on total amount of outstanding loans. This suggests that clients did not increase savings through costly actions, that is, disinvesting or borrowing money. On the contrary, it seems that after training, individuals in the treatment group bought more assets. Looking at the breakup of assets, it seems that trained households mostly bought more liquid assets, which are typically substitutes of formal savings (gold and silver), and there was no impact of training on pur-

TABLE 8
AVERAGE IMPACTS ON ASSETS, LOANS, AND INCOME

	Land and Livestock Bought (1)	Gold and Silver Bought (2)	Total Assets Bought (3)	Total Assets Sold (4)	Loans (5)	Individual Monthly Income (6)
A. Intention-to-Treat Estimates						
Only treatment	-44.91 (300.2)	978.1** (483.7)	2,071** (797.9)	-259.2 (474.5)	574.7 (1,592)	4.17 (38.71)
Treatment and post- harvest reminder	83.27 (317.9)	1,197* (640.9)	2,507** (1,034)	-278.9 (417.8)	-1,594 (1,716)	-8.65 (40.84)
Only postharvest reminder	178.5 (296.3)	116.4 (520.9)	1,268 (816.6)	251.2 (481.5)	-1,198 (1,520)	-47.18 (41.64)
Observations	2,921	2,914	2,921	2,921	2,899	2,918
R ²	.01	.02	.03	.02	.04	.91
Mean of endline variable in control group	1,500	2,367.2	5,378.16	2,079.82	15,527.02	1,806.43
B. FWER Estimates						
Intention-to-treat estimates			1,749	-333.8	614.1	20.63
p			.011**	.291	.585	.485
p FWER			.064*	.527	.760	.736
Observations			2,885	2,885	2,882	2,866
R ²			.04	.02	.03	.91

Note. Standard errors are clustered at the agent/village level. Controls include the baseline values of the dependent variable and all the variables unbalanced at the baseline: whether the client has at least secondary education, whether the client had a loan, the number of females in the household, whether the client had a non-FINO bank account, and the level of overall financial literacy. In panel B, controls also include baseline total cash savings, consumption, loans, and monthly income. In col. 6, the baseline monthly income is estimated through a recall question. FWER, family-wise error rate.

* $p < 0.1$.

** $p < 0.05$.

chase of illiquid assets (such as land). We also do not find any effects on household income.

E. Heterogeneity of Results

We continue this section by noting our results for heterogeneity analysis. The full results are shown in the appendix. We do not present a full description of the results here to conserve space but also because we have limited prior beliefs about what potential heterogeneities might be important. We thus focus on a set of heterogeneities that are common in the literature. Furthermore, most of the results do not hold after controlling for multiple comparisons, and so we present these only as exploratory.

We find four main results. First, financial attitudes change more among less educated individuals. Second, changes in interest in financial matters and a

shift from informal to formal savings are found among individuals more financially educated at the baseline. Third, the intervention was less effective for more impatient individuals. Fourth, individuals assigned to treatment who already had a formal savings account changed their interest in financial matters, improved their overall financial knowledge, and saved more than the average in the treatment group. This suggests that a history of savings is an important requisite for reaping the full benefits of the intervention and is in line with the literature on savings highlighting the significance of habit formation (De Mel, McIntosh, and Woodruff 2013; Akbas et al. 2016).

F. Multiplicity of Outcomes across Families

When we account for the multiplicity of outcomes across families and calculate the FWER p -values, considering all our main outcome variables as belonging to one group, only the treatment effect on savings remains statistically significant, as shown in table 9. The procedure we use to estimate these results is as follows. First, for each family of homogenous outcomes presented in the same table, we construct an index of standardized outcomes, that is, the simple average of the outcomes within the family, standardized using the mean and the standard deviation of the outcome estimated from control areas at endline. Second, in order to take into account the multiplicity of tests when doing inference, for each index we also report the corrected FWER p -value.

V. Discussion

Our key finding is that the financial education program increased total formal savings on average by 49% (as compared with the endline savings of the con-

TABLE 9
AVERAGE IMPACTS ON MAIN OUTCOME INDICES

	Savings Index (1)	Financial Literacy Index (2)	Consumption Index (3)	Assets, Loans, and Income Index (4)
Variables included	Table 5, panel B	Table 6, panel B	Table 7, panel B	Table 8, panel B
Intention-to-treat estimates	.10	.072	.006	.046
p	.014**	.172	.903	.303
p FWER	.052*	.430	.904	.511
Observations	2,867	2,867	2,865	2,867
R^2	.12	.10	.09	.09

Note. Standard errors are clustered at the agent/village level. Controls include all the variables unbalanced at the baseline (whether the client has at least secondary education, whether the client had a loan, the number of females in the household, whether the client had a non-FINO bank account, and the level of overall financial literacy), along with baseline total cash savings, consumption, loans, and monthly income.

* $p < 0.1$.

** $p < 0.05$.

trol group). This effect appears to come in part from a decrease in temptation goods. After the endline survey, we also conducted a qualitative survey with 102 clients (82 from the treatment group and 20 from the control) in order to understand the causes of the success of the intervention. Confirming the results of the quantitative analysis, among treated clients, 95% declared to have saved more after the training, while only 20% of control clients indicated an increase in savings during the same period. In particular, clients from the treated group reported being able to save more, thanks to gaining an understanding of how to save and of the value of saving, especially the value of accumulating small savings.

While our study suggests that programs offering simple and useful financial information can be successful in changing behaviors, the rather short-term horizon of the evaluation and the high cost of the program lead us to be concerned about advocating for such an approach. Further research should focus on identifying lower cost ways to disseminate financial information.

The remainder of this section focuses on two points. First, we speculate on why we have found impacts on savings behavior while others have not. We then end with a discussion of a simple cost/benefit analysis of the program.

A. Why Do We Find Impacts?

As mentioned in the introduction, previous experiments (except Jamison et al. 2014; Sayinzoga et al. 2016) do not find an impact on savings from financial literacy programs in the developing world. Three main reasons could explain such a difference in results.

First, the program was delivered in conjunction with a doorstep banking service, where FINO agents visit the clients in regular intervals and discuss the banking issues. As Schaner (2017) underlines, even if one considers the benefits of formal savings versus home savings, individuals might still be averse to saving formally when savings are small because bank accounts also have a fixed transaction cost and any difference between interest rates might not be attractive enough to outweigh it. When the transaction cost is reduced, individuals who were already using a bank account will make more deposits and withdrawals, while other individuals who were not using bank accounts will start to use them. Eventually, such an increase in account use is likely to lead to higher formal (but not necessarily total) savings levels. However, even offering a formal banking service for free might not be enough if the quality of the service is not ensured and trust issues are not addressed. For example, Dupas et al. (2014) emphasizes that efforts to expand financial access will effectively achieve financial inclusion only by comprising a communication component that brings awareness of the various financial options available.

It is possible that this financial education program was successful as a marketing campaign for FINO, helping to increase familiarity with and the perception of quality of the bandhus' service. During our endline survey, we asked respondents a full set of questions regarding their satisfaction with the FINO account, and we use the responses to investigate how much the marketing of FINO services contributed toward the impact of the program on savings. Table A5.A shows how the results change for average impacts on savings increments when we control for ex-post quality of the service.²⁰ The effect of the financial education program on FINO savings is diminished in magnitude; nonetheless, it retains its significance, suggesting that the program indeed had a direct impact on savings, apart from the indirect effect that it might have had by increasing the familiarity with and the perception of the quality of FINO service. Most importantly, the significant and positive effect of the financial education program on average total savings for the treatment group remains unchanged, and even the magnitude of the coefficient is very close to the one in the estimation that does not control for quality. On the other hand, table A5.A provides evidence suggesting that the quality of service is an important determinant of the amount of FINO savings. Table A5.B shows that there is indeed a substantial heterogeneity of impact depending on the frequency with which FINO agents visited the village: those who were assigned to treatment and were visited by a bandhu in the past 3 months increased their FINO savings by about Rs 200.²¹ It is conceivable that the bandhus who visited the client households intensified the effect of training because they often remind the clients about the importance of savings. A postendline qualitative study with clients indicated that those who saved more quoted increased bandhu visit as an important factor behind their increase in savings.

The second explanation for the success of this intervention is that the 49% increase in total savings may be linked to the 4% change in financial attitudes. While it is not possible to test the actual mechanisms at work here, we believe that this indicator of financial literacy might represent applied financial knowledge, as coined by Doi et al. (2014), and it might be a proxy for the important ability of taking appropriate financial decisions in everyday life. Also, it might more generally measure the degree of familiarity with and confidence in the financial system because the questions are mostly about suggesting financially

²⁰ We measure quality of service by exploiting the responses of clients to the following question: How would you rate the overall FINO agent/bandhu service? Very bad, not good, satisfactory, good, or very good?

²¹ For other types of savings, there was no heterogeneous impact because of the frequency with which FINO agents visited the village.

appropriate saving devices over more informal solutions. According to this approach, financial attitudes might be a proxy for trust in the formal financial system and thus might really be crucial for achieving an effective financial inclusion. This hypothesis can well explain not only why FINO savings increased but also that savings in other nationalized banks' accounts showed a positive and significant increment. Additionally, FINO *bandhus* accept deposits only in the basic no-frills account and do not offer the term deposits, which are savings products with significantly better returns (approximately 3%–4% higher). These term deposits are usually offered by the other public and private sector banks, which might have attracted the savings of the treatment group.

A third possible reason for success is that the program was so focused on responsible financial behavior (including savings and borrowing) that it directly encouraged savings and contributed to boosting attention and commitment toward savings, in addition to its effect on financial attitudes. This hypothesis is consistent with a growing body of literature on savings in developing countries that underlines the power of facilitating the mindset of saving money (Dupas and Robinson 2013b). It is also consistent with our analysis of the heterogeneous effects of the program, which highlight that the training was effective mostly among patient individuals. The intervention did not affect time preferences and did not offer a time commitment device, and therefore it could not be successful for people with higher discount rates. This further suggests that the program did not change deep preference parameters, instead affecting only attitudes toward saving.

B. Sources of Increase in Savings

Our results indicate that total savings has increased significantly among the treatment households. However, we are unable to account for the full increase in savings from our current survey indicators. A part of the observed increase in savings was financed through a fall in expenditure in temptation goods, although this is smaller than the observed increase. One possibility is that the treated households reduced their other nonessential, nondurable expenses, such as the ceremonial expenses. These expenses were discussed in one of the training modules, which emphasized the importance of identifying and minimizing superfluous expenses that can release funds for building up savings. However, the ceremonial expenses were not captured in the survey, and thus it is not possible to test that hypothesis.

Also, the research team, while informally interacting with the treated households after the endline survey, found many instances where the treated clients (especially female clients) mentioned adopting a habit of setting aside a small portion of their earnings before handing it over to their spouses or other

head of the households. Thus, it is possible that the amount set aside contributed to increased savings through small and disciplined savings practices, although there was no apparent increase in household's average monthly income during that period. Again, no data were collected on this specific indicator, and so we cannot test for this explicitly.

C. Cost/Benefit of the Program

The training cost is \$25 per participant if the cost of developing the video is not included (the cost of scaling the program with other bank clients in India) and \$28 if the cost of the video is included (the cost of replicating the program elsewhere).²² This cost is higher than that of a similar training, evaluated by Cole et al. (2011), which was estimated to cost \$17 per participant. Although we do not have complete information on the content and coverage of that intervention, the difference in cost could be due to the fact that FINO held a 2-day classroom setting training that used video-based materials (leading to higher cost of venue to support video casting) in addition to standard printed training materials (e.g., leaflets, flip charts).

Considering that the intervention increased total cash savings by about \$39, is this a sufficiently cost-effective program? Given that savings in all nationalized banks increased by only \$34, the program might be too costly for one single financial entity to implement if the sole goal is to increase deposits. The intervention also does not perform well when compared with some other programs. Recent research on unconditional cash grants has found significant welfare improvements that increase over time.²³ It is highly likely that simply delivering the cost of the program to participants in the form of cash would have had greater welfare impacts, although not necessarily changing savings behavior. The results presented here though are for only short-term impacts and so may not fully reflect the total impacts of the program.

D. Some of Our Limitations

We recognize five important limitations to this study. First, the results we present here are short-term only, and so we cannot comment on the long-term impacts of this financial literacy program. It is possible that the impacts fade away over time or perhaps increase. This is, of course, a common problem for most studies that rely on only one endline data collection to determine impact. To partially

²² See table A7.

²³ See, e.g., Blattman, Fiala, and Martinez (2014), who find large effects from a semiconditional cash transfer program in Uganda that shifted individuals from subsistence-level agriculture to skilled employment. Also, Haushofer and Shapiro (2016) find large household welfare effects from a fully unconditional cash transfer program in Kenya.

account for this, we look at changes in the balance people hold in their FINO account using administrative data provided to us by FINO from April 2012 to January 2014. The results are presented in table A6. We find a consistent treatment effect over this time period. While this does not present evidence of a sustained effect from the program over time on all sources of savings, it does suggest that there may be some long-term benefits from the program.

Second, we cannot directly test why the current program worked to increase savings behavior when others have not. We discuss why we believe the lack of effect from trainings found in the literature thus far is due to individual lack of experience with savings in general, but this discussion is entirely speculative. Third, we cannot account for where the additional savings has come from. We have evidence that a significant amount is due to decreases in spending on temptation goods, but there is no change in income, other consumption behavior, or other spending that can account for the full amount. Fourth, the experimental design does not allow us to identify the role of doorstep banking in our results. Recent work by Mehrotra, Somville, and Vandewalle (2016) suggests that the presence of bank agents in villages can increase savings rates, but we cannot say how this interacts with the results we obtain. Finally, the results we present are based on self-reported information and are therefore susceptible to a desirability bias: beneficiaries may have overstated their savings because they thought that this was what the interviewer wanted to hear, given the content of the intervention. However, we also report administrative data on holdings in FINO accounts. The size of the impact is much smaller, but the impacts show a pattern similar to self-reported data.

It is also worth noting that the cost of the program was relatively high compared with the observed effects. While this is not a limitation of the study itself, the cost of the program combined with the short-term time period of the results leads us to conclude that there are likely more cost-effective ways to improve welfare in these households.

References

- Akbas, Merve, Dan Ariely, David Robalino, and Michael Weber. 2016. "How to Help the Poor to Save a Bit: Evidence from a Field Experiment in Kenya." IZA Discussion Paper no. 10024, Institute for the Study of Labor, Bonn.
- Anderson, Michael. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103, no. 484:1481–95.
- Atkinson, Jesse, Alain de Janvry, Craig McIntosh, and Elisabeth Sadoulet. 2013. "Prompting Microfinance Borrowers to Save: A Field Experiment from Guatemala." *Economic Development and Cultural Change* 62, no. 1:21–64.

- Banerjee, Abhijit, Shawn Cole, Esther Duflo, and Leigh Linden. 2007. "Remedying Education: Evidence from Two Randomized Experiments in India." *Quarterly Journal of Economics* 122, no. 3:1235–64.
- Behrman, Jere, Olivia Mitchell, Cindy Soo, and David Bravo. 2012. "The Effects of Financial Education and Financial Literacy: How Financial Literacy Affects Household Wealth Accumulation." *American Economic Review: Papers and Proceedings* 102, no. 3:300–4.
- Bernard, Tanguy, Stefan Dercon, Kate Orkin, and Alemayehu Seyoum Taffesse. 2014. "The Future in Mind: Aspirations and Forward-Looking Behaviour in Rural Ethiopia." CSAE Working Paper no. 2014-16, Centre for the Study of African Economies, Oxford.
- Blattman, Christopher, Nathan Fiala, and Sebastian Martinez. 2014. "Generating Skilled Self-Employment in Developing Countries: Experimental Evidence from Uganda." *Quarterly Journal of Economics* 129, no. 2:697–752.
- Bruhn, Miriam, Luciana de Souza Leão, Arianna Legovini, Rogelio Marchetti, and Bilal Zia. 2016. "The Impact of High School Financial Education: Experimental Evidence from a Large-Scale Evaluation in Brazil." *American Economic Journal: Applied Economics* 8, no. 4:256–95.
- Bruhn, Miriam, and David McKenzie. 2009. "In Pursuit of Balance: Randomization in Practice in Development Field Experiments." *American Economic Journal: Applied Economics* 1, no. 4:200–232.
- Carpena, Fenella, Shawn Cole, Jeremy Shapiro, and Bilal Zia. 2011. "Unpacking the Casual Chain of Financial Literacy." World Bank Policy Research Working Paper no. 5798, World Bank, Washington, DC.
- Cole, Shawn, Thomas Sampson, and Bilal Zia. 2011. "Price or Knowledge? What Drives Demand for Financial Services in Emerging Markets?" *Journal of Finance* 66, no. 6:1933–67.
- Cole, Shawn, Petia Topalova, and Robert Townsend. 2014. "Estimating Potential Gains from Mobile Payments in India: First Evidence from a Large Household Survey." Paper presented at the 2014 Annual Bank Conference on Africa, Paris, June 23–24.
- Deb, Anamitra, and M. Kubzansky. 2012. "Bridging the Gap: The Business Case for Financial Capability." Unpublished manuscript, Citi Foundation Report.
- De Mel, Suresh, Craig McIntosh, and Christopher Woodruff. 2013. "Deposit Collecting: Unbundling the Role of Frequency, Salience, and Habit Formation in Generating Savings." *American Economic Review: Papers and Proceedings* 103, no. 3: 387–92.
- Demirguc-Kunt, Asli, and Leora Klapper. 2012. "Measuring Financial Inclusion: The Global Findex." World Bank Policy Research Working Paper no. 6025, World Bank, Washington, DC.
- Demombynes, Gabriel, and Aaron Thegeya. 2012. "Kenya's Mobile Revolution and the Promise of Mobile Savings." World Bank Policy Research Working Paper no. 5988, World Bank, Washington, DC.
- Doi, Yoko, David McKenzie, and Bilal Zia. 2014. "Who You Train Matters: Identifying Combined Effects of Financial Education on Migrant Households." *Journal of Development Economics* 109:39–55.

- Drexler, Alejandro, Greg Fischer, and Antoinette Schoar. 2014. "Keeping it Simple: Financial Literacy and Rules of Thumb." *American Economic Journal: Applied Economics* 6, no. 2:1–31.
- Duflo, Esther, and Emmanuel Saez. 2003. "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment." *Quarterly Journal of Economics* 118, no. 3:815–42.
- Dupas, Pascaline, Sarah Green, Anthony Keats, and Jonathan Robinson. 2014. "Challenges in Banking the Rural Poor: Evidence from Kenya's Western Province." In *African Successes, Volume III: Modernization and Development*, ed. Sebastian Edwards, Simon Johnson, and David N. Weil, 63–101. Chicago: University of Chicago Press.
- Dupas, Pascaline, and Jonathan Robinson. 2013a. "Savings Constraints and Microenterprise Development: Evidence from a Field Experiment in Kenya." *American Economic Journal: Applied Economics* 5, no. 1:163–92.
- . 2013b. "Why Don't the Poor Save More? Evidence from Health Savings Experiments." *American Economic Review* 103, no. 4:1138–71.
- Grifoni, Andrea, and Flore-Anne Messy. 2012. "Current Status of National Strategies for Financial Education: A Comparative Analysis and Relevant Practices." OECD Working Paper no. 16 on Finance, Insurance, and Private Pensions, Organisation for Economic Cooperation and Development, Paris.
- Haushofer, Johannes, and Jeremy Shapiro. 2016. "The Short-Term Impact of Unconditional Cash Transfers to the Poor: Experimental Evidence from Kenya." *Quarterly Journal of Economics* 131, no. 4:1973–2042.
- Jamison, Julian, Dean Karlan, and Jonathan Zinman. 2014. "Financial Education and Access to Savings Accounts: Complements or Substitutes? Evidence from Ugandan Youth Clubs." NBER Working Paper no. 20135, National Bureau of Economic Research, Cambridge, MA.
- Kaiser, Tom, and Lukas Menkhoff. 2016. "Does Financial Education Impact Financial Behavior, and If So, When?" DIW Berlin Discussion Paper no. 1562, Deutsche Institut für Wirtschaftsforschung, Berlin.
- Liebman, Jeffrey, and Erzo Luttmer. 2015. "Would People Behave Differently If They Better Understood Social Security? Evidence from a Field Experiment." *American Economic Journal: Economic Policy* 7, no. 1:275–99.
- Lusardi, Annamaria, and Olivia Mitchell. 2006. "Financial Literacy and Planning: Implications for Retirement Wellbeing." Pension Research Council Working Paper no. 1, Pension Research Council, Philadelphia.
- . 2007. "Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education." *Business Economics* 42, no. 1:35–44.
- . 2011. "Financial Literacy around the World: An Overview." *Journal of Pension Economics and Finance* 10, no. 4:497–508.
- . 2014. "The Economic Importance of Financial Literacy: Theory and Evidence." *Journal of Economic Literature* 52, no. 1:5–44.
- McKenzie, David. 2012. "Beyond Baseline and Follow-Up: The Case for More T in Experiments." *Journal of Development Economics* 99:210–21.

- McKenzie, David, and Christopher Woodruff. 2014. "What Are We Learning from Business Training and Entrepreneurship Evaluations around the Developing World?" *World Bank Research Observer* 29, no. 1:48–82.
- Mehrotra, Rahul, Vincent Somville, and Lore Vandewalle. 2016. "Increasing Trust in the Bank to Enhance Savings: Experimental Evidence from India." Unpublished manuscript.
- Miller, Margaret, Julia Reichelstein, Christian Salas, and Bilal Zia. 2015. "Can You Help Someone Become Financially Capable? A Meta-Analysis of the Literature." *World Bank Research Observer* 30, no. 2:220–46.
- Prina, Silvia. 2015. "Banking the Poor via Savings Accounts: Evidence from a Field Experiment." *Journal of Development Economics* 115:16–31.
- Sayinzoga, Aussi, Erwin Bulte, and Robert Lensink. 2016. "Financial Literacy and Financial Behaviour: Experimental Evidence From Rural Rwanda." *Economic Journal* 126:1571–99.
- Schaner, Simone. 2017. "The Cost of Convenience? Transaction Costs, Bargaining Power, and Savings Account Use in Kenya." *Journal of Human Resources* 52, no. 4: 919–945.
- Thyagarajan, S., and Jayaram Venkatesan. 2008. "Cost-Benefit and Usage Behaviour Analysis of No Frills Accounts: A Study Report on Cuddalore District." IFMR/CMF Working Paper, IFMR/CMF, Chennai.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie. 2011. "Financial Literacy and Stock Market Participation." *Journal of Financial Economics* 101:449–472.
- Westfall, Peter, and Stanley Young. 1993. *Resampling-Based Multiple Testing: Examples and Methods for P-Value Adjustment*. New York: Wiley & Sons.
- World Bank. 2014. "Global Financial Development Report: Financial Inclusion." Unpublished manuscript, World Bank Report.
- Xu, Lisa, and Bilal Zia. 2012. "Financial Literacy around the World: An Overview of the Evidence with Practical Suggestions for the Way Forward." World Bank Policy Research Working Paper no. 6107, World Bank, Washington, DC.