NBER WORKING PAPER SERIES

DOES LASTING BEHAVIOR CHANGE REQUIRE KNOWLEDGE CHANGE? EVIDENCE FROM SAVINGS INTERVENTIONS FOR YOUNG ADULTS

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Working Paper 28011
http://www.nber.org/papers/w28011

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
October 2020

This study was registered in the American Economic Association Registry for randomized controlled trials (AEARCTR-0000080). Institutional Review Board approval for human subjects protocols from Innovations for Poverty Action #113.10February-006 and Yale University #1002006384. We thank the Financial Education Fund from DFID for funding. We thank the IPA field team, Zach Freitas-Groff, Sarah Kabay, Daniel Katz, Sana Khan, Charity Komujurizi, Matthew Lowes, Justin Loiseau, Javier Madrazo, Joseph Ndumia, Doug Parkerson, Pia Raffler, Elana Safran, Noor Sethi, Marla Spivack, Glynis Startz, and Sneha Stephen from Northwestern University and Innovations for Poverty Action for research assistance and management support. We thank the Freedom from Hunger and Straight Talk team for collaboration on development of the financial education curriculum, FINCA for the provision of the bank accounts, and four dioceses of the Church of Uganda for their cooperation throughout. Earlier results from this project appeared in NBER Working Paper No. 20135. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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Evidence From Savings Interventions For Young Adults
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NBER Working Paper No. 28011
October 2020
JEL No. D12,D91,O12

ABSTRACT

Is financial knowledge change necessary for lasting savings behavior change? Or, akin to the canonical Friedman billiards player, can behavior persist "as if" such knowledge is held? We randomize 240 Ugandan young-adult clubs to financial education, savings account access, both, or neither. Each education arm, but not the account-only arm, increases financial knowledge and trust in banks at one-year. But at five-years the knowledge effects disappear, and the trust effects diminish. Savings activity, wealth, and income increase at both one-year and five-years for all treatment arms, suggesting that knowledge change is unnecessary for lasting impacts on behavior and outcomes.

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Financial inclusion remains an important development goal worldwide, with most of the world's population lacking basic financial literacy and bank account access. Two prevalent financial inclusion interventions are financial education and basic savings account promotion. Financial education presumes the importance of building financial knowledge for navigating previously unfamiliar and increasingly complex formal markets. Basic savings account interventions presume the importance of facilitating formal market access.

Yet many questions remain about these interventions and underlying mechanisms. Is financial knowledge change necessary for lasting savings behavior change and outcome improvement? Or, instead, is financial knowledge for a successful saver akin to physics knowledge for Friedman's successful billiards player (Friedman 1953): do agents behave "as if" they have learned some underlying principles, without demonstrating that knowledge gain on a traditional test? And which interventions are effective at improving downstream outcomes like income and wealth, particularly over longer horizons?

We address such questions using a four-arm randomized evaluation alongside extensive primary data collection one-year and five-years after intervention onset. We randomly assigned 240 Church of Uganda youth clubs (median age=22) to receive either financial education ("education-only"), facilitated access to a group bank savings account ("account-only"), both ("account+education"), or neither.

Group-based financial education delivery is common through schools, workplaces, and NGOs. Group-based savings mechanisms are also common, both traditionally, through informal institutions, and more recently through various formal institutions. Religious clubs feature prominently in Uganda and neighboring countries, with 50% or more of young adults belonging to one. Our interventions and sample are thus broadly interesting for researchers, policymakers, and practitioners working on financial inclusion and poverty alleviation.

Our baseline survey of 2,810 club members reveals low levels of financial knowledge and formal financial bank account usage, and moderate levels of income (with substantial heterogeneity). The account intervention offered groups easy access to a basic group savings account with a local affiliate of an international microfinance institution. The financial education intervention is a 10-week, 15-hour curriculum, designed and refined by three international and

local NGOs, focusing on the formal financial system, savings costs and benefits, budgeting and planning, and communicating with others about money.

We administer two follow-up surveys to measure knowledge and other decision inputs, savings, income and other pre-registered "downstream" behaviors and outcomes. These surveys take place roughly 1-year (N=2,680) and 5-years (N=1,969) after random assignment, with no evidence of differential attrition rates.

We find substantial take-up and utilization of both interventions; e.g., club members attended about half of the ten financial education sessions, and about half of clubs used the savings account actively. These relatively high rates[1] are not driven by group-based economic activities, which have very low prevalence and are not moved by the treatments. Instead, we speculate, the key is piggybacking service delivery on pre-existing group meetings. Regardless of why utilization is high, these first-stage results provide statistical power for identifying moderately-sized treatment effects on decision inputs, behaviors, and downstream outcomes over our two follow-up horizons.

Our main decision inputs of interest are those covered by the financial education curriculum. We find no evidence that the account-only arm changes financial knowledge, planning, agency (control over household resources), or trust in banks. In contrast, after one year there is strong evidence that each education arm produces large increases in financial knowledge and trust in banks. At five-years, the evidence suggests that knowledge effects disappear while the trust effects persist but perhaps lessen.

Next, we estimate average and quantile treatment effects on several measures of saving behavior and assets.[2] We find some evidence that each treatment substantially and persistently increases savings activities. There are hints that the education arms produce larger increases in savings than the account-only arm; increasing financial knowledge is likely valuable. But we cannot rule out equal effects from, or economically large savings balance increases in, the account-

[1] Our savings account take-up rate is comparable to that found in other studies in Sub-Saharan Africa, but with substantially higher utilization (see, e.g., Dupas et al (2018)). For financial education, we are not aware of any systematic review of take-up or engagement rates but several papers find low participation rates (Lara Ibarra, McKenzie, and Ruiz-Ortega forthcoming; Burke et al. 2020; Bruhn, Lara Ibarra, and McKenzie 2014).

[2] We define savings based on a broad set of asset measures, both formal and informal, and liquid and illiquid. We also estimate treatment effects on borrowing and, finding none, infer increases in wealth.

only arm. This suggests that increasing financial knowledge may not be necessary to generate lasting and positive changes in financial condition, a tentative inference that is reinforced by our next set of findings.

We also estimate average and quantile treatment effects on income, motivated by the mixed evidence from prior work on the downstream effects of savings interventions. There is evidence of large, positive and lasting average effects on total income in each of the three treatments. And we do not find strong evidence that the education arms produce larger increases, suggesting that increasing financial knowledge or trust is neither necessary nor complementary for generating lasting improvement in financial status.

Hoping to shed light on which mechanisms *are* influential, we estimate treatment effects on measures of several other inputs and outputs: altruism, patience and self-control, and risk aversion; business activity and investment; other investments and spending patterns; various measures of formal labor market effort. We find suggestive evidence consistent with Schaner's (2018) entrepreneurship channel and Callen et al.'s (2019) labor effort channel, but our estimates are mostly imprecise. Given the many favorable conditions in our study - relatively high intervention take-up rates, two follow-up surveys, large treatment effects on downstream outcomes, and a sample of about 2,000 - our inability to sharply identify mechanisms is sobering. But our results remain enlightening, at least suggestively, in the sense that they cannot rule out several of these mechanisms being important. Indeed, we collected data on many decision inputs and outputs because many savings interventions are posited to work through multiple mechanisms.

Our study contributes to several literatures.

Based on Kaiser et al.'s (2020) meta-analysis of randomized financial education interventions, we infer that we fill five gaps in that impact evaluation literature. First, we address whether knowledge change is essential for lasting improvements in financial behavior and outcomes, and find evidence suggesting it is not. Second, we provide in-sample evidence on relative effectiveness, finding that education-only and account-only deliver similar effects on savings activity and income. Third, we provide evidence of education's interaction with increased account access, with little evidence of complementarity and some evidence for substitutability. Fourth, we extend impact measurement horizons with our five-year endline, finding that the initially strong positive impact on financial knowledge dissipates. And we provide long-run evidence of effects

on savings activities, finding that initial positive effects persist. Fifth, we provide evidence on the effects of financial education on income generation, which we infer is novel since Kaiser et al. do not include income in their set of downstream outcomes.

We also build on a large literature on savings encouragement interventions.[3] First, we provide novel evidence on whether market experience alone produces measurable changes to decision inputs like financial knowledge or trust, and find no evidence that it does. Second and third, we provide some in-sample evidence on the relative effectiveness of and interaction between savings access and financial education, as discussed above. Fourth, we extend impact measurement horizons with our five-year endline, although there are at least two other studies with three- or four-year measurement horizons for savings and income (Beaman, Karlan, and Thuysbaert 2014; Schaner 2018). Fifth, we add to the evidence that direct deposit and commitment (Brune et al. 2016), temporary yield incentives (Schaner 2018) or deposit collection (Callen et al. 2019) can produce lasting increases in income-generation, which is useful to know because most other savings encouragement studies have not detected effects on earnings (e.g., Aggarwal, Brailovskaya, and Robinson 2020; Banerjee et al. 2020; Bastian et al. 2018; Beaman, Karlan, and Thuysbaert 2014; Dupas et al. 2018; Prina 2015; Somville and Vandewalle 2019).

Three papers have similar 2x2 experimental designs, but are unable to focus on the primary question we are posing, whether knowledge change from financial education interventions is necessary for long-term behavior change. We also build on these via increased power as well as longer-term measurement. Abarcar et al. (forthcoming) implements a similar design in the Philippines for transnational households with relatively high baseline rates of financial inclusion, but finds no change in financial literacy as a by-product of the financial education treatment alone, and also has low take-up rates of its encouraged savings account and limited power to detect its effects. Abebe et al. (2018) uses savings reminders instead of a savings access treatment with Ethiopian micro-entrepreneurs who already have substantial financial access at baseline, but it has limited power to detect downstream impacts, and also does not find improvement in financial literacy from the financial education-only treatment arm. Cole et al.'s (2011) seminal paper uses financial incentives to encourage account opening among unbanked Indonesian households, but it

[3] In contrast to financial education, we could not find any meta-analyses of savings encouragement interventions. We focus our positioning with respect to the 46 papers described in Appendix Table 1.

is underpowered for detecting effects on savings and does not estimate effects on financial knowledge or downstream outcomes.

From a broader anti-poverty program design and evaluation perspective, our results demonstrate two micro-level approaches to increasing wealth and income over a five-year horizon for low-income households. Our effect sizes and confidence intervals are similar to those found in Callen et al. (2019) and Schaner (2018). They are also similar to those found in successful multi-faceted "Graduation" programs that cost about an order of magnitude more than our interventions (Bandiera et al. 2017; Banerjee et al. 2015). One potentially key difference is that Graduation programs tend to target very poor households in remote villages, whereas our sample is broader.

I. Research Design and Implementation

Our study design features treatments assigned and administered at the youth club level, and club member surveys measuring decision inputs and outputs at baseline and one-year and five-year follow-ups.[4]

A. Club Sampling and Baseline Survey

We created our sample by obtaining permission from The Church of Uganda to work with its youth clubs. Clubs typically have about 40 members and engage in activities including bible study, choir, community service, continuing education, and travel to conventions with other clubs. According to 2012 Afrobarometer data, 50% of Ugandans aged 18-25 belong to a religious community group.

Our sample contains 240 clubs, sampled from each of Uganda's four administrative regions, that each satisfy three criteria: (1) Physical access to a FINCA branch, defined as being located within a 60-minute walk of public transportation to the district capital (to make the bank account treatment workable); (2) Active programming, defined as meeting at least twice a month (to make the financial education treatment workable); (3) Large enough, defined as having at least 12 members over the age of 16 (to facilitate obtaining the target sample size).[5]

[4] Appendix Figure 1 provides a design overview.
[5] Appendix Figure 2 provides details on study areas and club sampling.

B. Club Member Sampling, Baseline Survey, and Randomization

We created a sample frame for surveying active individual club members by using the club survey to identify the roster of members attending club meetings during both school terms and holidays. We then randomly selected 12 members and 4 alternates aged 16 and up from each club, for a baseline survey sample frame of 240*16= 3,840 members. Surveyors approached selected members at club meetings and administered the survey around the club's regular meeting place during May and June of 2010.

We completed 2,810 baseline surveys and then randomly assigned clubs evenly to education-only, account-only, account+education, and control, stratifying on region and an indicator for above-median baseline savings.

The club member baseline reveals a mean age of 24 (SD=7) years, with 63% under 25 and 31% a household head. 43% are female, and 38% are currently attending school, with an average educational attainment of 9th grade for those no longer in school. Financial knowledge and trust are low (see Section II-B), as is formal account ownership (37%) and usage (29% of formal account owners report frequent use). Savings and earnings are very heterogeneous, with about half the sample classifiable as poor but others showing moderate levels of resources. Turning to randomization balance checks, we find little evidence of imbalance across our four arms.[6]

C. Financial Education Treatment

Innovations for Poverty Action (IPA) developed the financial education course in cooperation with the NGOs Freedom from Hunger and Straight Talk Foundation (STF), an organization which runs a Ugandan network of youth groups. The course is based on an earlier curriculum developed by the Global Financial Education Program (GFEP) that targets those near the poverty line in developing countries. STF further refined the curriculum after piloting it with 176 youth in four STF clubs.

The 15-hour curriculum focuses on saving (see Table 1 notes).[7] The pedagogical approach uses active and customized learning, with an emphasis on role playing, mini-cases, and group activities (Kaiser and Menkhoff 2018).

[6] Appendix Table 2 reports baseline statistics and randomization balance checks.

[7] Saving is the most frequent downstream behavior measured in the 76 RCTs analyzed in Kaiser et al.'s (2020) meta-analysis of financial education programs. Those programs have mean (median) instruction hours of 12 (7).

IPA hired and trained instructors (with recruiting help from FINCA) who led the classes and tracked attendance. Some clubs scheduled course sessions to piggyback on regular club meeting times, while others arranged for separate times. We estimate that developing and delivering the course cost about US$61 per person in 2020 dollars.[8]

Mean attendance is 4.6 sessions out of ten, and standard deviation of 3.9 and median of five. 75% of attended at least one session, and mean attendance conditional on attending at least one meeting is 6.2 sessions.[9] We do not find any evidence that the control group or account-only arms got any financial education.

Our key takeaway from attendance data is that we have a reasonably powerful and symmetric first stage: substantial levels of engagement with the course, and similar treatment intensity across the two education arms.

D. Savings Account Treatment

The savings accounts were offered by FINCA, an international microfinance institution. IPA and FINCA sought to design an account that would minimize transaction costs (pecuniary and otherwise), deciding on a group-based account as the most practical way to keep costs down while still enabling FINCA to deliver basic services. Group delivery was novel in the sense that we could not find evidence of other *formal* group accounts in the market, but familiar in the sense that our sample had substantial baseline exposure to *informal* group-based savings mechanisms.[10]

Each club had only one FINCA account and was responsible for selecting members to serve as field agents and a treasurer for handling deposits and withdrawals. FINCA did not impose any fees except for account closure or pay interest on account balances. Clubs were required to make a deposit within thirty days of opening the account and had to maintain a minimum balance of 50,000 UGX,[11] below which withdrawals were not permitted.[12]

[8] Trainer and manager compensation and expenses account for about 80%.
[9] Appendix Table 3 reports session-level attendance statistics, Appendix Figure 3 illustrates participant perceptions of course content from focus group data.
[10] ROSCAs and SACCOs are prevalent in our study communities. E.g., 63% of the clubs in our sample had one or more members with positive savings in one in baseline.
[11] $1 USD = about 2,400 UGX during our sample period; inflation ranged from 5%-10%.
[12] Clubs making an initial deposit subsequently met the minimum balance requirement at 76% of our monthly snapshots in year 1, with 70% of these clubs meeting the requirement in every month.

FINCA began marketing in each of the study regions in November 2010, roughly in accordance with the study design: we encouraged FINCA to begin marketing to the 120 clubs assigned to our two account arms around the time that the financial education course was concluding.[13] FINCA marketers first met with clubs to introduce the account, and in most cases returned for additional meetings to open the account and train the club's field agents and treasurer, making around four visits to each club on average.[14] We estimate this intervention cost US$28 per person in 2020 dollars.[15]

FINCA data indicate 60% and 72% of clubs open accounts in the account-only and account+education arm, respectively, and 52% and 53% of clubs, respectively, have non-zero balances after one year.[16] FINCA neither marketed to nor opened accounts for the control or education only-arms during our study period.

Our key takeaways from FINCA data are a reasonably powerful first stage that may have operated somewhat differently across the two account arms.

E. Endline Surveys and Attrition

We administered one-year endline surveys between June and August 2011, nine to twelve months after the last financial education sessions, and seven to ten months after the start of account marketing. The five-year endline was administered February to July 2015. We attempted to re-survey all baseline survey respondents and obtained 2,680 completed surveys (95% retention) at one-year, and 1969 (70%) at five-years.

We find little evidence of differential attrition rates across study arms: the biggest pairwise difference in the retention rate, across the four arms and two endlines, is two percentage points. Regressing a survey completion indicator on the three treatment assignment indicators to formally test for differential rates yields *p*-values of 0.59 at one-year and 0.85 at five-years. We also explore changes in sample composition across study arms by testing whether the means of key baseline variables, which were balanced at baseline, remain balanced at endlines. Univariate tests indicate

[13] FINCA required Church authorization to open the accounts, and this authorization took three months longer than expected to obtain in Mbarara Diocese (Western region). But marketing continued during the delay.
[14] We tracked marketing effort and find no evidence of differential marketing across the two account arms.
[15] This covers marketer and manager compensation and expenses, and is equal to the subsidized portion of intervention cost under the assumption that FINCA makes weakly positive profits on the margin.
[16] See Appendix Table 3 for additional usage statistics.

weak evidence of compositional changes, and multivariate tests do not reject changes at the five-year endline. Therefore we control for an outcome's baseline value when estimating treatment effects.[17]

II. Treatment Effects and Mechanisms

A. Estimation Strategy and Table Organization

We estimate average impacts of financial education and account access by comparing outcomes across treatment arms, and between each treatment arm and the control group, using OLS models of the form:

$$(1)\ Y_{ijt} = \beta_{1t} EdAcct_j + \beta_{2t} EdOnly_j + \beta_{3t} AcctOnly_j + \phi Y_{ij0} + \gamma StratVars_j + \varepsilon_{ijt}$$

where Y_{ijt} is an outcome variable (a decision input, behavior, or downstream outcome of interest), for member i of club j in time period t (either the one-year or five-year endline) or 0 (baseline). The treatment arm variables have the control group as the omitted category and take the value of 1 if individual i was randomly assigned to that study arm. We use only the random assignment, and thereby identify intent-to-treat (ITT) estimates β, because we lack separate instruments for the extensive and intensive margins of participation. We cluster standard errors at the unit of randomization, the club. $StratVars_j$ is a vector of stratification variables described in Section I-B. Our quantile regressions take the same form, replacing Y_{ijt} with one of its deciles.

Each table covers an "outcome class": decision inputs, saving, income, and other mechanisms. We adjust for multiple hypothesis testing by reporting a family-wise error rate (FWER) adjusted *p*-value for each ITT estimate, defining a family as either the full set of components in each table-endline or the aggregate measure in each table-endline.[18] One-year endline estimates are always in Panel A and five-year in Panel B. Each panel-column in Panels A and B presents results from a single regression. At the bottom of each of these panels we report *p*-values for tests of equality

[17] Appendix Table 4 has additional details on retention rates and tests for sample composition changes.
[18] We calculate adjusted *p*-values using Westfall and Young's (1993) single-step resampling with 10,000 bootstraps. This method offers more power than the Bonferroni correction by accounting for the dependency structure between hypotheses.

across treatment arms and for complementarity. Panel C reports *p*-values on the difference between the one- versus five-year effects, for each treatment arm.

B. Treatment Effects on Key Decision Inputs

Table 1 presents estimates of treatment effects on four decision inputs covered in the financial education curriculum: knowledge, planning, agency, and trust. These also could be affected by market experience (induced by, e.g., the account access intervention). Each outcome measure here is a standardized index of several related measures of one of the four inputs.[19] In Section II-E, we will consider decision inputs that are not a focus of the curriculum, as part of our exploration of mechanisms.

The financial knowledge index in Column 1 is a standardized score of 19 questions regarding bank regulation and basic financial concepts like budgeting, interest, and collateral. The control group mean is 9.7 correctly answered (SD= 2.8) at one-year and 10.0 at five-years. At one-year, the education arms each increase knowledge, by 0.17 and 0.19 SDs (SEs of 0.06, adjusted *p*-values 0.03 and 0.01), relative to either the control arm or account-only arm (the *p*-values on the differences between the account-only arm and each education arm are each <0.01). These one-year magnitudes are quite similar to the mean estimated effect of 0.20 SD of financial education on financial knowledge in Kaiser et al.'s (2020) meta-analysis, where the median impact measurement horizon is about a half-year. Our one-year effects are no longer present at five years (the point estimates fall to 0.05 and -0.01), with *p*-values on the within-arm difference between one- vs. five-year treatment effects of 0.14 and 0.01. We find no evidence that account-only affects knowledge, and the five-year confidence interval does not contain a substantial positive effect size.

The financial planning index averages across four component measures of tracking, routine and emergency planning, and plan implementation. At one-year, 64% of the control group reports regularly keeping track of money, and 18% report regularly making any preparation for emergencies. There is little evidence of treatment effects on financial planning, although these nulls are imprecisely estimated.

[19] Appendix Tables 5-8 report results separately for each index component.

The financial agency index averages across three component measures of financial decision-making power in the household. At one-year, 73% of the control group reports that others in their household would not be angry if the respondent saved alone, and 58% report always making their own financial decisions. There is little evidence of treatment effects on financial agency, although we cannot rule out substantial and persistent positive effects from account+education.

The financial trust index averages across responses to two questions about the security of bank deposits. At one-year, only 44% of the control group says that bank savings definitely would not be stolen, and only 43% that savings definitely would be repaid if the bank were robbed. The education arms each increase trust substantially at the one-year follow-up, by 0.22 and 0.32 SD (SEs 0.05, adjusted *p*-values < 0.01) relative to either the control group or the account-only group. Panel B shows that these effects dissipate by year five to 0.12 and 0.20 (SEs 0.06, adjusted *p*-values = 0.66 and 0.05, respectively), but are still statistically significantly different than zero. Moreover, evidence for dissipation is only suggestive: the p-values on the difference between one- vs. five-year treatment effects are 0.13 and 0.14. The estimates for the account-only arm suggest no effect but are imprecisely estimated.

Altogether, the results suggest that education produces a large increase in knowledge that is still evident after one year and then dissipates, and large and more lasting increases in trust in banks. We find no evidence that increasing only account access changes decision inputs.

C. Treatment Effects on Savings

Table 2 reports impacts on various pre-registered measures of assets and liabilities (Columns 2-7), and an index that averages across them (Column 1).[20] To elicit current asset balances, we first asked respondents whether they save in each of 13 different savings "locations" (e.g., a hiding place in the home, a ROSCA, a group account at a formal bank etc.) and then how much they currently hold in each.[21]

[20] We also pre-registered savings goals as an outcome, and consider goal-setting and planning in the planning index in Table 1.

[21] Appendix Table 9 shows results for each location. As expected, given the evidence from FINCA data (Appendix Table 3), and the lack of other formal group account offerings in the market (Section I-D), we see each of our account arms increasing formal group account usage at the one-year endline. Otherwise, the evidence suggests that each treatment increases the number of locations used relative to control, and that these effects persist over time and are diffuse across multiple locations.

Starting with the savings index for brevity's sake, each of the six point estimates across the two follow-ups are positive, with none smaller than a 0.10 SD increase. Three have *p*-values <0.01, and two <0.10. We do not reject equality of treatment effects within-arm across the two follow-up horizons (Panel C). And although the point estimates on account-only are weakly lower than those for the education arms, we do not reject equality across treatment arms (the *p*-values for the pairwise comparisons between account-only and the other arms range are 0.17, 0.32, 0.34, and 0.72). The one-year account-only effect may be dampened somewhat relative to the education arms because subjects were exposed to the account for less time than to education.[22]

Total savings balances (Column 4) is the sum of the monetary value across all savings locations. Baseline savings balances are extremely heterogeneous, with a 1% top-coded mean of 118,000 UGX (SD= 335,000, Appendix Table 2). Because total savings balance is arguably our most important savings outcome, we consider treatment effects on alternative functional forms in Appendix Table 10, finding similar results: uniformly positive point estimates, some evidence that these increases are statistically significant, little evidence that any effects dissipate over time, and mixed evidence on whether treatment effects differ across arms. We also present quantile regression results (Figure 1, top panels). Treatment effects are weakly positive throughout the distribution, for each arm at each follow-up time horizon, and more positive towards the top of the distribution, with the strongest results from account+education and the weakest from account-only. (Note that the estimated null effects at lower deciles are not all due to a large mass of non-savers, as only 14% reports zero savings.)

Altogether, we infer that the interventions substantially and persistently increase savings balances. These results are statistically sharper for the savings index than for balances alone. The index treatment effects are moderate- to large-sized in relative terms; e.g., Kaiser et al.'s (2020) meta-analytic estimate of the effect of financial education on savings is 0.10 SD.

More suggestively, our estimates do not rule out one-for-one increases in long-term wealth per shilling of subsidy, given our estimated intervention costs of roughly 100,000 UGX (account) or 200,000 UGX (education) in 2014 currency. There are also indications, from the ITT point estimates and the top deciles, that the education arms, and the account+education arm in particular, produced larger increases in savings than account-only.

[22] This is due to a combination of design, which sought to have accounts offered at the conclusion of the 3-month curriculum, and an account marketing delay in one of the four regions.

D. Treatment Effects on Income

Table 3 reports impacts on various pre-registered measures of income (Columns 1-5). To elicit income, the surveys start by asking "We would like to know about what work you did to earn money since 90 days ago. Have you done any activities to earn any money? This can include small activities or even being given something as a thank-you for work you did." and then, if answered positively, "Please take a moment to think about what work you did to earn money in that time. Please tell me the activities that you got money from in these months", before then asking for various details on each activity, including the amount earned in the past 90 days.

Total income in Column 1 analyzes the sum of the sources in Columns 2-5.[23] Baseline earnings average about 110% of the individual poverty line, with substantial heterogeneity. Several patterns are evident in the treatment effect estimates. The point estimates are uniformly positive across all six arm-endline combinations. They each have *p*-values between 0.09-0.19 after adjusting for multiple hypotheses across treatment arms. They each imply increases of about 15-20% over the control group mean[24] and are similar across arms within-endline. And they are uniformly larger in levels at five-years than one-year, with *p*-values between 0.13 to 0.34.

Because total income is arguably our most important measure of earnings, we estimate treatment effects on alternative functional forms, finding similar results, in Appendix Table 11. We also present quantile regression results (Figure 1, bottom panels). As with savings, we see weakly positive effects throughout the distribution, for each arm at each endline, although here we do see more evidence of effects from account-only, at least at five-years.

Altogether, we infer that the interventions substantially and persistently increase income, with no strong evidence that effects differ across arms. If we take the treatment effect point estimates literally, they imply annual earnings increases of roughly 1 shilling per 1 shilling of account subsidy and per 2 shillings of education subsidy.

[23] We also include "other" income in total income. Club-generating income is considered "other" and constitutes 1% of total income.

[24] The control group endline means in Table 3 suggest a substantial upward trend in control group earnings. We suspect this is due partly to life-cycle patterns and partly to inflation and other macro trends (e.g., about 25% real GDP growth over our study period).

E. Other Treatment Effects and the Search for Mechanisms

The results thus far do not paint a clear picture of the mechanisms underlying the treatment effects, in part because we see increases in income (and, to a suggestive but statistically weaker extent, savings) in the account-only arm, which did not experience changes in the key decision inputs (Table 1). If the increased financial knowledge and trust in the education arms are not essential for lasting behavior change and outcome improvements, what is essential? A related issue is unpacking the relationship between increases in savings balances and increases in income.

Table 4 starts by exploring the latter issue. Column 5 reports imprecise null effects on an index of expenditures and consumption (although our survey was not a full inventory of either).[25] This lack of cutback in spending, combined with the lack of an increase in borrowing (Table 2 Column 7), suggests the savings balance increase likely came from the increase in income à la Callen et al. (2019). We do not find evidence that treated members change sources of income (Columns 1 and 2), and the confidence intervals rule out big changes. Increases in work effort - specifically, working more often - are a more likely candidate, in the sense that five of six point estimates in Column 3 are positive and part of confidence intervals containing increases that would be sufficient to account for the treatment effects on income, but none individually is statistically significant. Another channel runs from saving to income, à la Schaner (2018): initial increases in saving might fund high-return investments that generate income by the time we conduct our first endline. Table 4 Column 4 (investment) and Table 3 Column 3 (business income) are consistent with this hypothesis in the sense that all point estimates are positive, albeit substantially smaller than those for total income.

Columns 6-8 consider the possibility that other decision inputs besides knowledge and trust drive the results, namely changes to preferences and/or beliefs. We were motivated to pre-register these inputs by the possibility that the financial education curriculum's focus on saving, planning and agency could indirectly affect time preferences (patience and self-control), risk tolerance, and altruism.[26] It could also be the case that account access alone changes these preferences, either by

[25] Appendix Table 12 reports results separately for each index component

[26] Subsequently, several financial education evaluations have estimated effects on youths' preferences; e.g., Sutter et al (2020).

changing motivation or through a feedback loop with behavior. Yet we find no evidence of such treatment effects.[27]

III. Discussion and Conclusion

Altogether our results suggest that increasing financial knowledge is valuable but not necessary for producing lasting changes in saving and earning behavior and improvements in financial condition. We conclude this from three key sets of results: (1) The account-only treatment arm does not change measured knowledge or other inputs, but does increase savings and income similarly to the financial education treatment arms; (2) The financial education treatment arms do increase measured knowledge after one year, but those effects disappear after five years; (3) Nevertheless the financial education arms' effects on savings and earnings persist after five years.

Returning to the Friedman billiards player analogy: we learn from the financial education treatment arms that persistent knowledge change is unnecessary for persistent behavior change. (Teaching physics or rudimentary finance may help someone improve at billiards or personal finance, but they can then forget the knowledge, at least in a "book learning" sense, and still do well.) And we learn from the account-only arm that financial knowledge change is not necessary to trigger persistent behavior change, even starting from a low base. (One can improve at billiards or personal finance without ever learning physics or finance principles.)

Our results also suggest the interventions studied here are cost-effective. They cost about an order of magnitude less than Graduation programs yet produce long-run impacts on wealth and income of similar magnitude.

However, we caution against inferring confidently that our interventions have lasting impacts, much less cost-effective ones, given the mixed evidence from prior work on downstream effects from both financial account access and financial education programs. Further replication and refinement of intervention design, delivery, and evaluation is needed to sharpen inferences regarding whether, how, and where such programs can generate the magnitude of effects found here.

[27] Treatment effect estimates for index components are in Appendix Tables 13-16. Appendix Table 17 reports estimates for other aspects of financial knowledge, and other aspects of expectations, not explicitly covered in the curriculum and finds little evidence of effects.

Another key takeaway is that we do not find sharp evidence for any particular mechanism. Many interventions have multiple plausible paths to impact, and so larger samples, higher-frequency data, and/or additional identification strategies may be required to identify which, if any, decision inputs or behaviors must change for downstream outcomes to improve.

References

Abarcar, Paolo, Rashmi Barua, and Dean Yang. forthcoming. "Financial Education and Financial Access for Transnational Households: Field Experimental Evidence from the Philippines." *Economic Development and Cultural Change*.

Abebe, Girum, Biruk Tekle, and Yukichi Mano. 2018. "Changing Saving and Investment Behaviour: The Impact of Financial Literacy Training and Reminders on Micro-Businesses." *Journal of African Economies* 27 (5): 587–611.

Aggarwal, Shilpa, Valentina Brailovskaya, and Jonathan Robinson. 2020. "Saving for Multiple Financial Needs: Evidence from Lockboxes and Mobile Money in Malawi." w27035. Cambridge, MA: National Bureau of Economic Research.

Bandiera, Oriana, Robin Burgess, Narayan Das, Selim Gulesci, Imran Rasul, and Munshi Sulaiman. 2017. "Labor Markets and Poverty in Village Economies." *The Quarterly Journal of Economics* 132 (2): 811–70.

Banerjee, Abhijit, Esther Duflo, Nathanael Goldberg, Dean Karlan, Robert Osei, William Parienté, Jeremy Shapiro, Bram Thuysbaert, and Christopher Udry. 2015. "A Multifaceted Program Causes Lasting Progress for the Very Poor: Evidence from Six Countries." *Science* 348 (6236): 1260799.

Banerjee, Abhijit, Dean Karlan, Robert Darko Osei, Hannah Trachtman, and Christopher Udry. 2020. "Unpacking a Multi-Faceted Program to Build Sustainable Income for the Very Poor." w24271. Cambridge, MA: National Bureau of Economic Research.

Bastian, Gautam, Iacopo Bianchi, Markus Goldstein, and Joao Montalvao. 2018. "Short-Term Impacts of Improved Access to Mobile Savings, with and without Business Training: Experimental Evidence from Tanzania." w478. Washington, D.C.: Center for Global Development.

Beaman, Lori, Dean Karlan, and Bram Thuysbaert. 2014. "Saving for a (Not so) Rainy Day: A Randomized Evaluation of Savings Groups in Mali," October.

Bruhn, Miriam, Gabriel Lara Ibarra, and David McKenzie. 2014. "The Minimal Impact of a Large-Scale Financial Education Program in Mexico City." *Journal of Development Economics* 108 (May): 184–89.

Brune, Lasse, Xavier Giné, Jessica Goldberg, and Dean Yang. 2016. "Facilitating Savings for Agriculture: Field Experimental Evidence from Malawi." *Economic Development and Cultural Change* 64 (2): 187–220.

Burke, Jeremy, Julian Jamison, Dean Karlan, Kata Mihaly, and Jonathan Zinman. 2020. "Credit Building or Credit Crumbling? A Credit Builder Loan's Effects on Consumer Behavior, Credit Scores and Their Predictive Power."

Callen, Michael, Suresh de Mel, Craig McIntosh, and Christopher Woodruff. 2019. "What Are the Headwaters of Formal Savings? Experimental Evidence from Sri Lanka." *The Review of Economic Studies* 86 (6): 2491–2529.

Cole, Shawn, Thomas Sampson, and Bilal Zia. 2011. "Prices or Knowledge? What Drives Demand for Financial Services in Emerging Markets?" *Journal of Finance* 66 (6): 1933–67.

Dupas, Pascaline, Dean Karlan, Jonathan Robinson, and Diego Ubfal. 2018. "Banking the Unbanked? Evidence from Three Countries." *American Economic Journal: Applied Economics* 10 (2): 257–97.

Friedman, Milton. 1953. *Essays in Positive Economics*. Chicago: Univ. of Chicago Press.

Kaiser, Tim, Annamaria Lusardi, Lukas Menkhoff, and Carly Urban. 2020. “Financial Education Affects Financial Knowledge and Downstream Behaviors.”
Kaiser, Tim, and Lukas Menkhoff. 2018. “Active Learning Fosters Financial Behavior: Experimental Evidence.”
Lara Ibarra, Gabriel, David McKenzie, and Claudia Ruiz-Ortega. forthcoming. “Estimating Treatment Effects with Big Data When Take-up Is Low: An Application to Financial Education.” *The World Bank Economic Review*.
Prina, Silvia. 2015. “Banking the Poor via Savings Accounts: Evidence from a Field Experiment.” *Journal of Development Economics* 115: 16–31.
Schaner, Simone. 2018. “The Persistent Power of Behavioral Change: Long-Run Impacts of Temporary Savings Subsidies for the Poor.” *American Economic Journal: Applied Economics* 10 (3): 67–100.
Somville, Vincent, and Lore Vandewalle. 2019. “Access to Banking, Savings and Consumption Smoothing in Rural India.” Working Paper HEIDWP09-2019. International Economics Department Working Paper Series. Graduate Institute of International and Development Studies.
Sutter, Matthias, Michael Weyland, Anna Untertrifaller, and Manuel Froitzheim. 2020. “Financial Literacy, Risk and Time Preferences: Results from a Randomized Educational Intervention.”

Table 1. Treatment Effects on Knowledge and Other Inputs Covered by the Financial Education Curriculum

	(1)	(2)	(3)	(4)
	Financial Knowledge Index	Financial Planning Index	Financial Agency Index	Financial Trust Index
Number of questions in index	19	4	3	2
Results for index components in	AT5	AT6	AT7	AT8
Panel A. One-Year Endline				
Account Access Only	0.01	0.03	-0.05	-0.01
	(0.06)	(0.06)	(0.06)	(0.06)
	[0.99]	[0.98]	[0.93]	[0.99]
Education Only	0.17	0.09	0.01	0.22
	(0.06)	(0.06)	(0.06)	(0.05)
	[0.03]	[0.70]	[0.99]	[<0.01]
Account + Education	0.19	-0.06	0.10	0.32
	(0.06)	(0.06)	(0.06)	(0.05)
	[0.01]	[0.93]	[0.51]	[<0.01]
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	2680	2680	2680	2680
p-values: Account Access Only = Education Only	<0.01	0.40	0.25	<0.01
p-values: Account Access Only = Account + Education	<0.01	0.17	<0.01	<0.01
p-values: Education Only = Account + Education	0.77	0.03	0.12	0.07
p-values: Account Access Only + Education Only = Account + Education	0.96	0.04	0.10	0.16
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel B. Five-Year Endline				
Account Access Only	-0.09	0.08	-0.03	0.06
	(0.07)	(0.06)	(0.07)	(0.07)
	[0.88]	[0.88]	[0.96]	[0.93]
Education Only	0.05	0.07	-0.11	0.12
	(0.07)	(0.08)	(0.07)	(0.06)
	[0.93]	[0.88]	[0.74]	[0.66]
Account + Education	-0.01	0.02	0.08	0.20
	(0.08)	(0.07)	(0.06)	(0.06)
	[0.97]	[0.97]	[0.88]	[0.05]
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	1969	1969	1969	1969
p-values: Account Access Only = Education Only	0.05	0.92	0.26	0.39
p-values: Account Access Only = Account + Education	0.37	0.32	0.10	0.05
p-values: Education Only = Account + Education	0.39	0.45	<0.01	0.19
p-values: Account Access Only + Education Only = Account + Education	0.87	0.16	0.02	0.77
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel C: Comparisons across One-Year and Five-Year Endlines				
p-values: Account Access Only One-year = Account Access Only Five-year	0.24	0.52	0.82	0.37
p-values: Education Only One-year = Education Only Five-year	0.14	0.88	0.11	0.13
p-values: Account + Education One-year = Account + Education Five-year	0.01	0.35	0.82	0.14

Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club), and FWER adjusted p-values in square brackets with a family of hypotheses defined as all treatment effects for an endline survey (i.e. 12 hypotheses per endline survey). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators. Item non-response rates are low and our indices average across non-missing components. The financial education curriculum covers one topic per meeting: (1) myths about the formal financial sector, (2) bank regulation by the Bank of Uganda, (3) how banks function as businesses, (4) the relative costs and benefits of saving versus borrowing, (5) targeted/goal-oriented saving, (6) budgeting and record keeping, (7) prioritizing spending decisions, (8) addressing challenges to saving, (9) making informed decisions about where and how to save, and (10) how to communicate about money. Handouts and homework assignments are used to reinforce each lesson. Members were informed ex-ante that attending seven or more sessions would earn a certificate of completion.

Table 2. Treatment Effects on Savings

	(1) Savings Index of Columns 2-7	(2) Any Savings (1/0)	(3) Total Number of Savings Locations	(4) Savings Balance ('000 UGX): 1% top-coded	(5) Any Resellable Asset (1/0)	(6) Formal Account (1/0)	(7) No Debt (1/0)
Panel A. One-Year Endline							
Account Access Only	0.12	0.01	0.09	45.00	0.01	0.05	0.04
	(0.07)	(0.02)	(0.05)	(37.33)	(0.02)	(0.02)	(0.03)
		[0.99]	[0.54]	[0.82]	[0.99]	[0.13]	[0.74]
Education Only	0.18	0.02	0.15	104.37	0.00	0.05	0.04
	(0.07)	(0.02)	(0.06)	(41.83)	(0.02)	(0.02)	(0.03)
		[0.82]	[0.08]	[0.08]	[0.99]	[0.26]	[0.77]
Account + Education	0.18	0.04	0.14	44.30	0.00	0.09	0.03
	(0.06)	(0.02)	(0.06)	(33.59)	(0.02)	(0.02)	(0.03)
		[0.37]	[0.11]	[0.82]	[0.99]	[<0.01]	[0.82]
Control Group Mean	0.00	0.84	1.28	221.94	0.12	0.16	0.48
Control Group SD	1.00	0.37	0.88	606.00	0.32	0.37	0.50
N	2680	2680	2680	2678	2680	2680	2680
p-values: Account Access Only = Education Only	0.34	0.51	0.29	0.14	0.83	0.75	0.92
p-values: Account Access Only = Account + Education	0.32	0.12	0.36	0.98	0.84	0.14	0.72
p-values: Education Only = Account + Education	0.99	0.29	0.86	0.10	0.99	0.07	0.78
p-values: Account Access Only + Education Only = Account + Education	0.18	0.71	0.20	0.05	0.79	0.75	0.20
Proportion of Obs Equal Zero	0.00	0.14	0.14	0.14	0.88	0.79	0.49
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B. Five-Year Endline							
Account Access Only	0.10	0.02	0.15	99.26	-0.00	-0.00	0.04
	(0.07)	(0.02)	(0.09)	(78.88)	(0.02)	(0.03)	(0.03)
		[0.96]	[0.57]	[0.92]	[0.98]	[0.98]	[0.92]
Education Only	0.12	0.01	0.12	123.41	0.02	0.03	0.01
	(0.07)	(0.02)	(0.09)	(91.02)	(0.02)	(0.03)	(0.03)
		[0.97]	[0.81]	[0.86]	[0.97]	[0.92]	[0.98]
Account + Education	0.19	0.02	0.18	188.15	0.03	0.04	0.04
	(0.07)	(0.02)	(0.08)	(84.08)	(0.02)	(0.03)	(0.03)
		[0.92]	[0.29]	[0.43]	[0.83]	[0.78]	[0.92]
Control Group Mean	0.00	0.86	1.60	552.14	0.13	0.23	0.51
Control Group SD	1.00	0.35	1.14	1202.70	0.33	0.42	0.50
N	1969	1969	1956	1960	1969	1956	1969
p-values: Account Access Only = Education Only	0.72	0.83	0.77	0.79	0.38	0.19	0.32
p-values: Account Access Only = Account + Education	0.17	0.81	0.70	0.31	0.11	0.10	0.83
p-values: Education Only = Account + Education	0.30	0.62	0.49	0.50	0.47	0.72	0.42
p-values: Account Access Only + Education Only = Account + Education	0.81	0.82	0.50	0.78	0.50	0.74	0.69
Proportion of Obs Equal Zero	0.00	0.13	0.13	0.13	0.87	0.75	0.47
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: Comparisons across One-Year and Five-Year Endlines							
p-values: Account Access Only One-year = Account Access Only Five-year	0.75	0.74	0.54	0.49	0.70	0.05	0.99
p-values: Education Only One-year = Education Only Five-year	0.44	0.76	0.75	0.83	0.63	0.67	0.46
p-values: Account + Education One-year = Account + Education Five-year	0.88	0.55	0.62	0.07	0.25	0.13	0.93

Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club), and FWER adjusted p-values in square brackets with a family of hypotheses defined as all treatment effects for an endline survey (i.e. 18 hypotheses per endline survey, excluding the savings index). We do not adjust p-values for the savings index because the index itself reduces the number of hypotheses tested. Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators. Our survey asks about 13 different savings locations (please see Appendix Table 9 for details). Total savings here is top-coded at the 99th percentile; please see Appendix Table 10 for results on other functional forms of savings balances.

Table 3. Treatment Effects on Income

	(1)	(2)	(3)	(4)	(5)
	Income ('000 UGX) last 90 days, top-coded at 99th percentile				
	Total	Formal Wage	Business	Farm	Informal
Panel A. One-Year Endline					
Account Access Only	31.06	-1.39	10.29	10.13	9.13
	(16.22)	(9.07)	(7.51)	(7.56)	(5.81)
	[0.11]	[0.96]	[0.74]	[0.72]	[0.69]
Education Only	32.45	15.12	2.76	5.62	9.11
	(16.44)	(8.80)	(7.56)	(6.50)	(6.40)
	[0.11]	[0.74]	[0.96]	[0.93]	[0.69]
Account + Education	36.34	16.55	7.25	4.07	2.96
	(17.01)	(9.48)	(7.59)	(6.42)	(5.76)
	[0.09]	[0.70]	[0.91]	[0.96]	[0.96]
Control Group Mean	200.79	70.07	38.51	42.93	29.90
Control Group SD	337.78	217.66	120.53	103.85	100.42
N	2661	2661	2661	2661	2661
p-values: Account Access Only = Education Only	0.93	0.09	0.30	0.58	1.00
p-values: Account Access Only = Account + Education	0.76	0.08	0.68	0.45	0.21
p-values: Education Only = Account + Education	0.83	0.89	0.55	0.83	0.27
p-values: Account Access Only + Education Only = Account + Education	0.26	0.84	0.59	0.26	0.06
Proportion of Obs Equal Zero	0.11	0.67	0.77	0.54	0.74
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes
Panel B. Five-Year Endline					
Account Access Only	75.47	-22.25	6.46	37.21	34.31
	(43.46)	(22.76)	(16.89)	(20.15)	(14.69)
	[0.19]	[0.89]	[0.99]	[0.47]	[0.27]
Education Only	71.70	12.06	24.32	-1.25	23.19
	(44.41)	(25.09)	(20.32)	(16.58)	(13.95)
	[0.19]	[0.99]	[0.78]	[1.00]	[0.68]
Account + Education	95.13	8.95	33.35	-0.34	44.42
	(43.15)	(24.74)	(18.43)	(16.89)	(14.87)
	[0.10]	[0.99]	[0.50]	[1.00]	[0.05]
Control Group Mean	482.02	148.29	105.38	112.03	97.27
Control Group SD	673.52	400.81	282.07	273.56	217.91
N	1963	1963	1963	1963	1963
p-values: Account Access Only = Education Only	0.94	0.11	0.38	0.07	0.47
p-values: Account Access Only = Account + Education	0.69	0.14	0.15	0.09	0.53
p-values: Education Only = Account + Education	0.64	0.89	0.68	0.96	0.17
p-values: Account Access Only + Education Only = Account + Education	0.43	0.56	0.93	0.19	0.54
Proportion of Obs Equal Zero	0.09	0.78	0.67	0.59	0.62
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes
Panel C: Comparisons across One-Year and Five-Year Endlines					
p-values: Account Access Only One-year = Account Access Only Five-year	0.28	0.33	0.82	0.15	0.10
p-values: Education Only One-year = Education Only Five-year	0.34	0.90	0.30	0.67	0.30
p-values: Account + Education One-year = Account + Education Five-year	0.13	0.74	0.14	0.78	<0.01

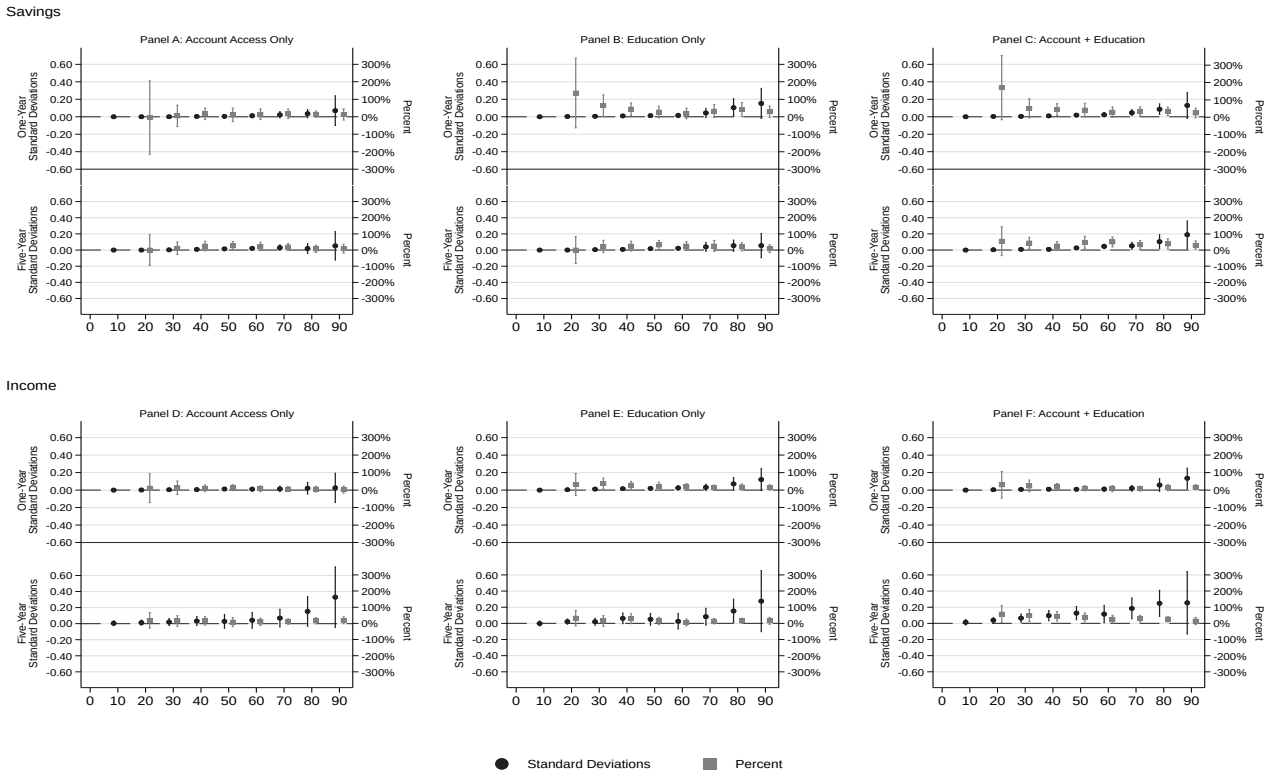
Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club), and FWER adjusted p-values in square brackets with two family of hypotheses per endline: (i) all treatment effects on total earnings for an endline survey (i.e. 3 hypotheses per endline survey), (ii) all treatment effects on earnings components for an endline survey (i.e. 12 hypotheses per endline survey). Each column-panel in Panels A and B report results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators. Please see Appendix Table 11 for results on other functional forms of earnings.

Table 4. Treatment Effects on Mechanisms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Primary Income Source Changed from Baseline	Number of Income Streams in Last 90 Days	Total Days Worked (in last 90)	Business Investment in Last 12 Months	Expenditures and Consumption Index	Patience and Self-Control Index	Risk Tolerance Index	Altruism Index
Number of questions in index					3	4, 6	3	2
Results for index components in					AT12	AT13, AT14	AT15	AT16
Panel A. One-Year Endline								
Account Access Only	-0.03	0.03	3.66	19.54	0.02	0.04	0.02	-0.08
	(0.03)	(0.05)	(2.79)	(33.04)	(0.06)	(0.06)	(0.06)	(0.06)
	[1.00]	[1.00]	[0.97]	[1.00]	[1.00]	[1.00]	[1.00]	[0.99]
Education Only	0.02	0.04	3.19	35.33	0.00	-0.00	-0.07	-0.05
	(0.03)	(0.05)	(2.75)	(30.82)	(0.04)	(0.06)	(0.06)	(0.06)
	[1.00]	[1.00]	[0.99]	[0.99]	[1.00]	[1.00]	[0.99]	[1.00]
Account + Education	0.00	0.02	1.85	37.21	0.01	0.04	-0.07	-0.10
	(0.03)	(0.05)	(2.62)	(34.84)	(0.04)	(0.05)	(0.06)	(0.06)
	[1.00]	[1.00]	[1.00]	[0.99]	[1.00]	[1.00]	[0.99]	[0.91]
Control Group Mean	0.52	1.41	46.70	178.59	0.00	0.00	0.00	0.00
Control Group SD	0.50	0.87	45.22	531.71	1.00	1.00	1.00	1.00
N	2013	2680	2660	2674	2680	2680	2677	2680
p-values: Account Access Only = Education Only	0.22	0.91	0.88	0.61	0.79	0.50	0.18	0.70
p-values: Account Access Only = Account + Education	0.40	0.86	0.54	0.61	0.96	0.88	0.16	0.73
p-values: Education Only = Account + Education	0.67	0.77	0.64	0.95	0.71	0.40	0.98	0.46
p-values: Account Access Only + Education Only = Account + Education	0.77	0.50	0.21	0.71	0.96	0.89	0.82	0.73
Proportion of Obs Equal Zero	0.49	0.11	0.11	0.52	0.00	0.00	0.00	0.00
Controls for Baseline Values	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Panel B. Five-Year Endline								
Account Access Only	-0.06	0.10	4.64	29.95	0.11	-0.04	0.11	0.05
	(0.04)	(0.06)	(3.48)	(73.14)	(0.07)	(0.07)	(0.06)	(0.07)
	[0.95]	[0.89]	[0.97]	[1.00]	[0.97]	[1.00]	[0.93]	[1.00]
Education Only	-0.08	0.03	-1.25	162.57	0.15	-0.01	0.04	-0.01
	(0.04)	(0.06)	(3.41)	(71.35)	(0.08)	(0.07)	(0.07)	(0.08)
	[0.77]	[1.00]	[1.00]	[0.68]	[0.81]	[1.00]	[1.00]	[1.00]
Account + Education	-0.06	0.11	7.21	83.69	0.07	-0.04	0.08	0.04
	(0.03)	(0.06)	(3.78)	(83.78)	(0.07)	(0.07)	(0.07)	(0.08)
	[0.95]	[0.85]	[0.72]	[0.99]	[1.00]	[1.00]	[0.98]	[1.00]
Control Group Mean	0.60	1.52	69.41	398.39	0.00	0.00	0.00	0.00
Control Group SD	0.49	0.91	57.96	1071.70	1.00	1.00	1.00	1.00
N	1504	1968	1968	1924	1962	1969	1969	2810
p-values: Account Access Only = Education Only	0.66	0.25	0.08	0.11	0.63	0.70	0.30	0.42
p-values: Account Access Only = Account + Education	0.97	0.92	0.49	0.57	0.67	0.95	0.72	0.90
p-values: Education Only = Account + Education	0.61	0.17	0.02	0.38	0.39	0.73	0.52	0.51
p-values: Account Access Only + Education Only = Account + Education	0.15	0.81	0.44	0.35	0.11	0.90	0.52	0.96
Proportion of Obs Equal Zero	0.45	0.08	0.08	0.38	0.00	0.00	0.00	0.00
Controls for Baseline Values	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Panel C: Comparisons across One-Year and Five-Year Endlines								
p-values: Account Access Only One-year = Account Access Only Five-year	0.50	0.33	0.81	0.89	0.29	0.40	0.30	0.20
p-values: Education Only One-year = Education Only Five-year	0.03	0.84	0.29	0.08	0.06	0.93	0.23	0.70
p-values: Account + Education One-year = Account + Education Five-year	0.19	0.21	0.18	0.57	0.41	0.35	0.07	0.17

Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club), and FWER adjusted p-values in square brackets with a family of hypotheses defined as all treatment effects for an endline survey (i.e. 24 hypotheses per endline survey). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators. Item non-response rates are low and our indices average across non-missing components.

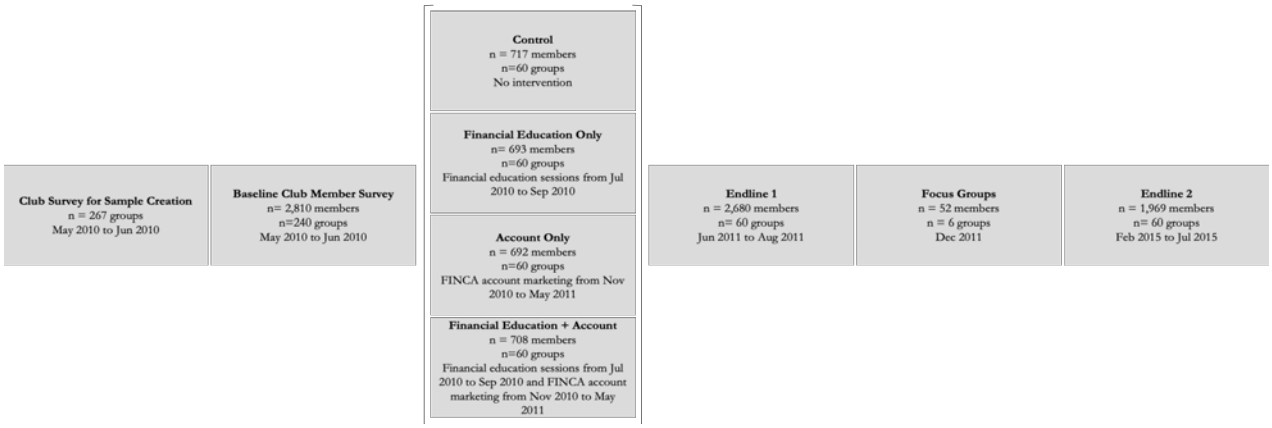
Figure 1. Quantile Treatment Effects for Savings and Income



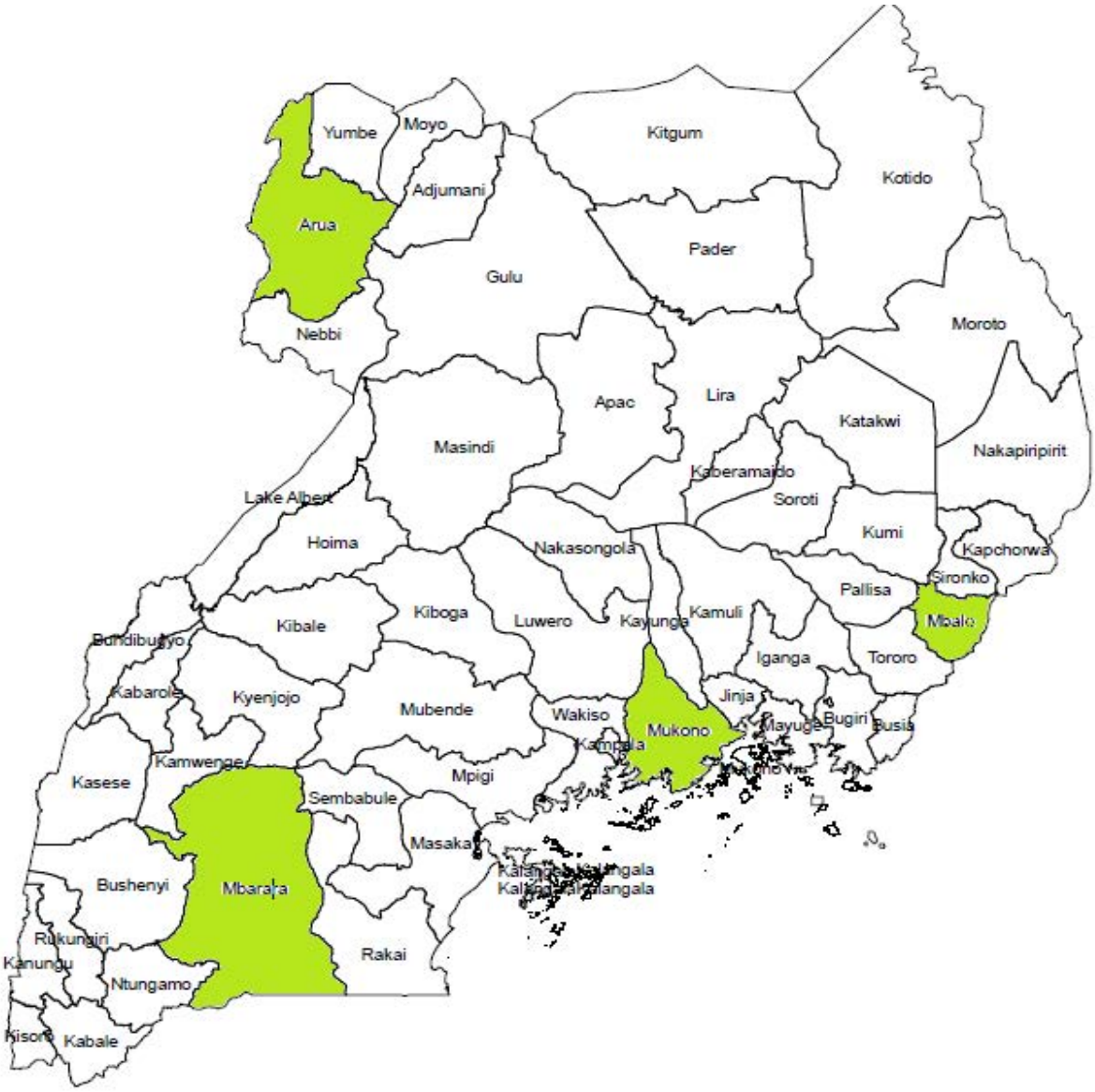
Notes: Treatment effects on the left axis in standard deviation units of the outcome variable, standardized with respect to the full control group. On the right axis we present treatment effects for the unadjusted outcome (i.e. valued in UGX) as a percentage of the relevant control group percentile. Each quantile regression controls for the baseline outcome (with a dummy for missing baseline value where needed) and stratification variable with standard errors clustered at the unit of randomization (the youth club).

For Online Publication: Appendices

Appendix Figure 1. Study Design and Timeline



Appendix Figure 2. District Map of Uganda with Study Areas Highlighted



Notes: Sampling: We chose study areas in consultation with our various implementing partner organizations, then identified 300 clubs in the vicinity of the district capitals in each study area, and then surveyed club officers in April and May 2010 to assess whether each club met the three eligibility criteria described in Section I-A. 267 clubs met the criteria and we randomly selected 240 of these for the study.

Appendix Figure 3a. Word cloud of responses to question: "What do you remember most from the financial education curriculum?"

Appendix Figure 3b. Word cloud of responses to question: "What was your favorite part of the financial education?"

Notes: Questions were asked during a series of focus groups in December 2011 (around five months after the one-year endline survey) with five groups of randomly selected members from the two education arms.

Appendix Table 1. Literature review of savings encouragement RCTs in developing countries

Study	Endline Measurement Horizon(s)			
	Financial Knowledge/ Literacy Impacts	Savings Impacts	Income Impacts	Spending/ Consumption Impacts
Abarcar et al. (2019) [1]	12	12	12	12
Abebe et al. (2018) [2]	5-7	5-7	5-7	5-7
Abraham et al. (2016) [3]		[0,2], 4		
Aggarwal et al. (2020) [4]		[0,9], 26	[0,9]	[0,9]
Aker et al. (2020) [5]		3-14	14	3-14
Ashraf et al. (2015) [6]		[0,48]		
Ashraf et al. (2006a) [7]		6, 12		
Ashraf et al. (2006b) [8]		6-15		
Atkinson et al. (2013) [9]		[0,36]		
Attanasio et al. (2019) [10]	3-29	[0,6], 10, 29		10
Avdeenko et al. (2019) [11]		2		
Banerjee et al. (2020) [12]		[0,24]	24, 36	24, 36
Bastian et al. (2018) [13]	12	[0,12]	12	
Batista and Vicente (2020) [14]		[0,23]		6
Beaman et al. (2014) [15]		36	36	36
Berry et al. (2018) [16]	8	8	8	8
Blumenstock et al. (2018) [17]		[0,25]		
Brune et al. (2016) [18]		14	14	14
Brune et al. (2017) [19]		1-2 weeks		1-2 weeks
Brune et al. (2019) [20]		[0,3]	[0,3]	1-5
Callen et al. (2019) [21]		[0,15], 21, 27	[0,15], 21, 27	[0,15], 21, 27
Carter et al. (2016) [22]		3-26		3-26
Cole et al. (2011) [23]		2, 24		
De Mel et al. (2018) [24]		7-26		
Dizon et al. (2019) [25]		7		
Dupas and Robinson (2013a) [26]		6, 12		6, 12
Dupas and Robinson (2013b) [27]		[4,7]		[4,7]
Dupas et al. (2012) [28]		[0,12]		
Dupas et al. (2018)				
Site 1: Uganda [29]		[0,24]	6-18	6-18
Site 2: Malawi [30]		[0,22]	6-18	6-18
Site 3: Chile [31]		[0,17]		
Flory (2018) [32]		24	24	24
Gertler et al. (2017) [33]		[0,18]		
Habyarimana and Jack (2018) [34]		6, 7		
Jamison et al. (2014) [35]	7-10	[0,8], 10	7-10	7-10
John (2020) [36]		3-6		6
Karlan and Linden (2014) [37]		[0,24]		
Karlan and Zinman (2018) [38]		[0,12]		
Karlan et al. (2016)				
Site 1: The Philippines [39]		3-24		
Site 2: Peru [40]		6-12		
Site 3: Bolivia [41]		10-12		
Kast and Pomeranz (2014) [42]		13-15		13-15
Kast et al. (2012)				
Study 1: Peer Groups [43]		[0,12]		
Study 2: Feedback Messages [44]		[0,3]		
Laajaj (2017) [45]		3-27	3-27	
Lipscomb and Schechter (2018) [46]		[0,13]		
Prina (2015) [47]		[0,12]		12
Salas (2015) [48]		9		
Schaner (2017) [49]		[0,36]		
Schaner (2018) [50]		[0,36]	36, 48	
Somville and Vandewalle (2019) [51]		[1,7]	[1,7]	[1,7]
Supanantaroek et al. (2017) [52]		3		

General Notes:

Time horizons in months unless indicated otherwise.

Numbers inside brackets indicate a time horizon, in months, for which high frequency data was collected, typically a bank's administrative data on savings.

Study-specific notes:

[1] Endline conducted 12 months since researchers started giving financial incentives to take-up treatment, since take-up had been very low.

[2] Endline conducted between 5 to 7 months after intervention.

[3] Savings data from administrative bank data spanning two months and a 3-4 month endline with questions on outside savings and gambling.

[4] Data from high-frequency phone surveys taken twice a week for 9 months. Only half of the participants were surveyed in these phone surveys. Additionally, 5 and 7 month follow-up surveys conducted for all participants on savings, income, and consumption outcomes, as well as a 26 month survey on savings outcomes.

[5] Savings and consumption outcomes from 3, 6 and 10 month phone surveys, and from a 14 month endline. Income outcomes from the 14 month endline.

[6] On top of 48 months of bank administrative data there was also a 12 month survey to measure total savings. Study is with US-based migrants, but the accounts are in El Salvador.

[7] Savings outcomes from 6 and 12 month follow-up surveys.

[8] Savings outcomes from 6, 10 and 15 month follow-up surveys.

[9] Savings outcomes from bi-monthly administrative portfolio data spanning 3 years, and data on all movements in the accounts.

[10] For savings outcomes there are 6 months of bank administrative data, as well as data from 3 follow-up surveys (3, 10, and 29 month). Financial literacy outcomes are from the 3, 10 and 29 month follow-ups. Consumption outcomes only from 10 month follow-up.

[11] Savings outcomes from 2 month follow-up.

[12] Savings outcomes from 2 years of administrative data. Income and consumption outcomes are from 24 and 36 month follow-up surveys.

[13] Savings outcomes are from 12 months of bank administrative data on transaction and from 12 month follow-up survey. Financial literacy and income outcomes are from the 12 month follow-up. Financial literacy outcomes are financial and business practices scores. An additional 20 month follow-up was scheduled to take place at the time of writing the working paper.

[14] Savings outcomes are from 23 months of administrative data and from a 6 month follow-up survey. Consumption outcomes are from the 6 month follow-up.

[15] And endline survey was conducted at 36 months. A smaller subset of the participants got surveyed either every 2-3 weeks or every 3-4 months over 20 months, in order to examine consumption smoothing outcomes.

[16] The intervention had not ended when the 8 month endline was conducted, so these are short-term impacts.

[17] Savings outcomes from 25 months of administrative data and from a 7 month endline survey.

[18] Savings, income and consumption outcomes from a 14 month follow-up survey.

[19] Savings and consumption outcomes from 1 week and 2 week surveys.

[20] Savings outcomes from 3 months of administrative data and 1 and 3 month follow-ups. Income outcomes from 3 months of administrative data. Consumption outcomes from 1, 3 and 5 month follow-ups. There are two additional 8 and 26 month follow-up surveys on assets.

[21] For 15 months some participants were surveyed monthly and some quarterly. Additionally, both groups got long-term follow-ups at months 21 and 27.

[22] Savings and consumption outcomes from 3, 15 and 26 month follow-up surveys (months after the savings intervention, which happened after the fertilizer subsidy intervention.)

[23] Main outcome is "Opened bank account 2 months after intervention." Then there was an endline 2 years after intervention with other savings outcomes.

[24] Savings outcomes are from 4 follow-up surveys, which were conducted at different times relative to intervention depending on when the accounts were activated. First follow-up: 7-11 month survey, full sample surveyed. Second follow-up: 9-13 month survey, only a sub-sample surveyed. Third follow-up: 13-17 month survey, only a sub-sample surveyed. Fourth follow-up: 19-26 month survey, full sample surveyed.

[25] Savings outcomes from 7 month follow-up survey.

[26] Savings and consumption outcomes from 6 and 12 month follow-up surveys. The reported consumption outcome is "amount spent on preventative health products."

[27] Data collected in self-reported logbooks, recorded daily from 4 to 7 months after intervention.

[28] Savings outcomes from 12 months of bank administrative data.

[29] Savings outcomes from 24 months of administrative data and from 6, 12 and 18 month follow-up surveys. Income and consumption outcomes from 6, 12 and 18 month follow-ups.

[30] Savings outcomes from 22 months of administrative data and from 6, 12 and 18 month follow-up surveys. Income and consumption outcomes from 6, 12 and 18 month follow-ups.

[31] There are 17 months of administrative data on savings. Take-up of accounts was low so there were no follow-ups to measure impact. There are qualitative surveys on why participants did not open an account.

[32] Savings, income and consumption outcomes are from 24 month follow-up survey. Savings outcome is "Has formal savings" dummy. Consumption outcome is a food-access score.

[33] Savings outcomes from 18 months of administrative data.

[34] Savings outcomes from 6 and 7 month follow-up surveys.

[35] Financial literacy, savings, income, and consumptions outcomes from a follow-up survey conducted between 7 and 10 months after intervention. Additionally, there are 8 months of administrative data on savings.

[36] Consumption outcomes from a 6 month follow-up. Savings outcomes from administrative data spanning from baseline to 3-6 months after baseline.

[37] Savings outcomes from administrative data spanning 24 months.

[38] Savings outcomes from 12 months of administrative data.

[39] The client chooses a commitment period ranging between 3 and 24 months. There is bank administrative data on deposits made in that period.

[40] The client chooses a commitment period ranging between 6 and 12 months. There is bank administrative data on deposits made in that period.

[41] The commitment period has a fixed end-date. Depending on when the client signs up the period could range between 9 and 11 months. There is bank administrative data on deposits made in that period.

[42] Outcomes come from follow-up survey conducted between 13 and 15 months after intervention, as well as bank administrative data.

[43] Savings outcomes from administrative data spanning 12 months.

[44] Savings outcomes from administrative data spanning 3 months. The second study came right after the first one, with the same study participants (re-randomizing and stratifying on Study 1 assignment).

[45] Savings and income outcomes from 3, 15 and 27 month follow-up surveys.

[46] Savings outcomes from administrative data on mobile account use spanning 13 months and a 12 month follow-up survey.

[47] Savings outcomes from bank administrative data spanning 12 months. Consumption outcomes from a 12 month follow-up survey.

[48] Data from both a 9 month endline and administrative data from month 9.

[49] Savings outcomes from bank administrative data spanning 36 months and from a 36 month endline survey.

[50] Savings outcomes from administrative data spanning 36 months and from a 36 month follow-up survey. Income outcomes from 36 month and 48 month follow-ups.

[51] Savings, income and consumption outcomes from weekly interviews conducted between months 1 and 4 and then again between months 6 and 7.

[52] Savings outcomes from 3 month follow-up survey.

Appendix Table 2. Baseline Summary Statistics and Balance

	(1)	(2)	(3)	(4)	(5)	(6)
	Mean (SD)					
	Full Sample	Control	Account Only	Education Only	Account + Education	row var on indicators for each treatment
Female	0.43	0.44	0.41	0.42	0.43	0.66
	(0.49)	(0.50)	(0.49)	(0.49)	(0.50)	
Age	23.82	23.31	24.12	23.83	24.02	0.13
	(7.19)	(6.60)	(8.09)	(6.68)	(7.32)	
Education: Highest Level Completed	10.28	10.32	10.11	10.45	10.23	0.35
	(3.56)	(3.49)	(3.51)	(3.70)	(3.54)	
Has Any Formal Account	0.37	0.37	0.36	0.37	0.37	0.95
	(0.48)	(0.48)	(0.48)	(0.48)	(0.48)	
Household Head (1/0)	0.31	0.29	0.32	0.32	0.31	0.68
	(0.46)	(0.46)	(0.47)	(0.47)	(0.46)	
Financial Knowledge Index	-0.02	0.00	-0.09	-0.01	0.00	0.26
	(0.98)	(1.00)	(0.98)	(0.96)	(0.98)	
Financial Planning Index	-0.03	0.00	-0.01	-0.05	-0.06	0.58
	(1.01)	(1.00)	(0.98)	(1.02)	(1.02)	
Financial Agency Index	-0.02	-0.00	-0.05	-0.01	-0.03	0.77
	(0.97)	(1.00)	(0.99)	(0.97)	(0.95)	
Financial Trust Index	-0.01	0.00	-0.01	-0.07	0.02	0.33
	(1.01)	(1.00)	(1.04)	(0.98)	(1.01)	
Total Savings ('000 UGX): 1% top-coded	118.21	117.71	117.90	135.49	101.92	0.30
	(334.81)	(337.75)	(352.38)	(367.29)	(274.74)	
Total Income ('000 UGX): 1% top-coded	140.05	129.47	141.87	150.20	139.15	0.42
	(230.77)	(226.77)	(243.17)	(233.16)	(219.96)	
N	2810	717	692	693	708	

Notes: Unit of observation is the club member. We have many additional baseline variables but, for concision, limit the set here to key demographics and outcome variables. Each cell in Column 6 provides the p-value from an F-test on the joint significance of the three treatment variables, from an OLS regression of the row variable on the treatment assignment dummies and stratification variables.

Appendix Table 3. Account usage and financial education attendance

	(1)	(2)	(3)	(4)
	Mean or Proportion (SE)			*p*-value
	Account Only	Education Only	Account + Education	(1)=(3) or (2)=(3)
Club Opened Savings Account	0.60 (0.06)	-	0.72 (0.06)	0.13
Conditional on Opening Account:				
FINCA Savings Account Balance at Time of One-year Endline Survey ('000 UGX)	107.47 (33.14)	-	180.97 (65.56)	0.25
Non-Zero FINCA Savings Account Balance at Time of One-year Endline Survey	0.86 (0.06)	-	0.73 (0.07)	0.12
Number of FINCA Transactions from Opening through One-year Endline Survey	3.87 (0.60)	-	4.20 (0.72)	0.59
Total financial education sessions attended	-	4.58 (0.28)	4.76 (0.22)	0.56
Attended all financial education sessions	-	0.13 (0.02)	0.13 (0.02)	0.79
Attended session: Myths about the formal financial sector	-	0.50 (0.03)	0.56 (0.03)	0.16
Attended session: Bank regulation by the Bank of Uganda	-	0.45 (0.03)	0.46 (0.03)	0.80
Attended session: How banks function as businesses	-	0.46 (0.03)	0.49 (0.03)	0.34
Attended session: Costs and benefits of saving versus borrowing	-	0.48 (0.03)	0.47 (0.03)	0.90
Attended session: Targeted/goal-oriented saving	-	0.47 (0.03)	0.49 (0.03)	0.44
Attended session: Budgeting and record keeping	-	0.44 (0.03)	0.46 (0.03)	0.68
Attended session: Prioritizing spending decisions	-	0.45 (0.03)	0.46 (0.03)	0.87
Attended session: Addressing challenges to saving	-	0.45 (0.03)	0.47 (0.03)	0.61
Attended session: Decisions about where and how to save	-	0.44 (0.04)	0.45 (0.02)	0.96
Attended session: How to communicate about money	-	0.45 (0.03)	0.45 (0.03)	0.98

Notes: Unit of observation is a club member, sample is those completing endline 1. Account data from FINCA and attendance data from instuctor logs. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each p-value in Column 4 is from a single regression using our usual specification but estimated using only subjects from two arms being compared in the row. For example, in the first four rows - for the savings variables - we only include individuals from clubs assigned to account access only or to account+education.

Appendix Table 4. Attrition: Retention Rates and Sample Composition Across Arms and Endlines

	(1)	(2)	(3)	(4)	(5)	(6)
	Balance: Mean (SD)					Composition
	Control	Account Only	Education Only	Account + Education	p-value of F-test of treatment assignment dummies after regression of row variable on treatment assignment dummies	p-value of F-test of interaction terms after regression of 1=completed survey on treatment assignment dummies, row variables, and row variables interacted with treatment assignment dummies
Panel A. One-Year Endline						
Completed survey	0.95	0.96	0.96	0.95	0.59	
	(0.23)	(0.21)	(0.19)	(0.21)		
Baseline statistics for those completing survey:						
Female	0.44	0.40	0.42	0.43	0.54	
	(0.50)	(0.49)	(0.49)	(0.49)		
Age	23.39	24.16	23.85	24.12	0.16	
	(6.56)	(8.03)	(6.69)	(7.40)		
Education: Highest Level Completed	10.35	10.09	10.47	10.22	0.24	
	(3.50)	(3.52)	(3.68)	(3.56)		
Has Any Formal Account	0.37	0.36	0.37	0.36	0.91	
	(0.48)	(0.48)	(0.48)	(0.48)		
Household Head (1/0)	0.30	0.32	0.32	0.31	0.73	
	(0.46)	(0.47)	(0.47)	(0.46)		
Financial Knowledge Index	0.02	-0.09	-0.01	0.01	0.17	
	(1.00)	(0.98)	(0.96)	(0.98)		
Financial Planning Index	-0.00	-0.01	-0.04	-0.06	0.68	
	(1.00)	(0.99)	(1.02)	(1.03)		
Financial Agency Index	0.00	-0.06	0.00	-0.02	0.68	
	(0.99)	(0.99)	(0.96)	(0.95)		
Financial Trust Index	-0.00	-0.02	-0.07	0.04	0.20	
	(1.00)	(1.05)	(0.97)	(1.01)		
Total Savings ('000 UGX): 1% top-coded	121.61	120.69	132.12	93.46	0.08	
	(346.16)	(359.62)	(357.19)	(235.95)		
Total Income ('000 UGX): 1% Winsor	131.10	141.98	151.41	138.17	0.46	
	(229.95)	(242.81)	(234.08)	(217.35)		
p-value: treatments X all variables above						0.24
p-value: treatments X outcome variables only (indices, savings, income)						0.12
N	678	661	666	675	2680	2810
Panel B. Five-Year Endline						
Completed survey	0.70	0.71	0.69	0.71	0.85	
	(0.46)	(0.45)	(0.46)	(0.46)		
Baseline statistics for those completing survey:						
Female	0.42	0.40	0.43	0.40	0.62	
	(0.49)	(0.49)	(0.50)	(0.49)		
Age	24.07	24.74	24.19	24.56	0.47	
	(6.88)	(8.29)	(6.98)	(7.50)		
Education: Highest Level Completed	10.33	9.99	10.58	10.17	0.06	
	(3.65)	(3.55)	(3.58)	(3.67)		
Has Any Formal Account	0.39	0.34	0.36	0.38	0.42	
	(0.49)	(0.47)	(0.48)	(0.49)		
Household Head (1/0)	0.32	0.34	0.35	0.33	0.88	
	(0.47)	(0.47)	(0.48)	(0.47)		
Financial Knowledge Index	0.06	-0.11	-0.04	0.03	0.02	
	(0.99)	(0.97)	(0.95)	(0.99)		
Financial Planning Index	0.07	0.03	-0.06	-0.05	0.13	
	(0.98)	(0.98)	(1.03)	(1.04)		
Financial Agency Index	0.06	-0.01	-0.00	-0.03	0.51	
	(0.96)	(0.96)	(0.94)	(0.95)		
Financial Trust Index	0.03	-0.04	-0.05	0.07	0.17	
	(1.02)	(1.06)	(0.99)	(0.98)		
Total Savings ('000 UGX): 1% top-coded	134.74	128.82	145.70	105.22	0.19	
	(360.59)	(368.62)	(395.53)	(239.25)		
Total Income ('000 UGX): 1% Winsor	140.29	147.22	156.57	150.15	0.76	
	(231.24)	(248.72)	(239.74)	(231.82)		
p-value: treatments X all variables above						0.02
p-value: treatments X outcome variables only (indices, savings, income)						0.03
N	500	491	478	500	1969	2810

Notes: Unit of observation is the club member. We have many additional baseline variables but, for concision, limit the set here to key demographics and outcome variables. Regressions in Columns 5 and 6 also include stratification variables.

Appendix Table 5. Treatment Effects on Financial Knowledge Summary Measures and Index Components

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	Summary measures		Index Components										
	Financial Knowledge Index - Same as Table 1 Col 1	Knowledge Questions Answered Correctly out of 19	Bank Regulation Index	Answered Correctly: Formal Budget	Answered Correctly: Interest with Borrowing	Answered Correctly: Wants	Answered Correctly: Interest of Savings	Answered Correctly: Rotating Savings	Answered Correctly: Collateral	Answered Correctly: Informal Budget	Answered Correctly: Savings Interest Rate Calculation	Answered Question on Interest Compounding Correctly	Answered Correctly: Loan Interest Rate Calculation
Panel A. One-Year Endline													
Account Access Only	0.01	0.10	0.04	0.01	0.01	0.01	-0.00	-0.12	0.03	0.02	-0.06	-0.01	0.06
	(0.06)	(0.17)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)
Education Only	0.17	0.46	0.11	0.12	0.03	0.15	0.15	0.10	0.01	0.10	-0.03	-0.06	0.01
	(0.06)	(0.17)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)
Account + Education	0.19	0.55	0.16	0.10	0.05	0.13	0.14	0.08	0.03	0.07	-0.05	0.02	0.04
	(0.06)	(0.16)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)
Control Group Mean	0.00	9.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	2.77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
N	2680	2680	2680	2680	2680	2680	2680	2680	2680	2680	2677	2680	2676
p-values: Account Access Only = Education Only	0.01	0.03	0.26	0.05	0.62	0.03	0.01	0.00	0.77	0.17	0.70	0.37	0.31
p-values: Account Access Only = Account + Education	0.00	0.01	0.05	0.15	0.42	0.07	0.01	0.00	0.99	0.42	0.91	0.64	0.64
p-values: Education Only = Account + Education	0.77	0.57	0.38	0.72	0.72	0.77	0.88	0.72	0.77	0.58	0.78	0.15	0.61
p-values: Account Access Only + Education Only = Account + Education	0.96	0.97	0.94	0.73	0.86	0.72	0.96	0.20	0.83	0.53	0.58	0.26	0.69
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No
Panel B: Five-Year Endline													
Account Access Only	-0.09	-0.19	-0.05	-0.05	0.01	0.02	-0.03	-0.04	-0.05	-0.13	-0.08	-0.06	0.03
	(0.07)	(0.18)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)
Education Only	0.05	0.24	0.11	0.05	0.09	0.03	0.00	-0.01	-0.05	-0.05	-0.08	-0.04	0.12
	(0.07)	(0.19)	(0.07)	(0.07)	(0.07)	(0.06)	(0.07)	(0.08)	(0.06)	(0.07)	(0.05)	(0.07)	(0.07)
Account + Education	-0.01	-0.03	-0.00	-0.10	-0.02	0.04	-0.02	0.03	0.01	-0.07	-0.10	0.07	0.09
	(0.08)	(0.21)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.08)	(0.06)	(0.07)	(0.05)	(0.07)	(0.07)
Control Group Mean	0.00	9.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	2.57	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
N	1969	1969	1969	1969	1969	1969	1968	1967	1969	1969	1969	1968	1968
p-values: Account Access Only = Education Only	0.05	0.02	0.04	0.13	0.26	0.85	0.69	0.74	0.99	0.21	0.98	0.83	0.19
p-values: Account Access Only = Account + Education	0.37	0.45	0.57	0.51	0.66	0.84	0.87	0.35	0.38	0.34	0.75	0.11	0.43
p-values: Education Only = Account + Education	0.39	0.21	0.15	0.04	0.13	0.98	0.81	0.53	0.36	0.80	0.75	0.13	0.67
p-values: Account Access Only + Education Only = Account + Education	0.87	0.76	0.54	0.32	0.23	0.83	0.92	0.45	0.23	0.24	0.38	0.10	0.55
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	No

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 3-13 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Unit of observation is a club member-endline. Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 6. Treatment Effects on Financial Planning Index Components

	(1)	(2)	(3)	(4)	(5)
		Index Components			
	Financial Planning Index - Same as Table 1 Col 2	Regularly Keeps Track of Money Spent	Regularly Plans for How to Spend Expected Money	Ratio of Financial Plans Succeeded to Plans Made	Prepares for Emergencies
Panel A. One-Year Endline					
Account Access Only	0.03	-0.01	-0.02	0.03	0.08
	(0.06)	(0.06)	(0.05)	(0.05)	(0.06)
Education Only	0.09	0.05	-0.02	0.04	0.12
	(0.06)	(0.06)	(0.06)	(0.05)	(0.07)
Account + Education	-0.06	-0.03	-0.12	-0.05	0.06
	(0.06)	(0.06)	(0.06)	(0.05)	(0.07)
Control Group Mean	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00	1.00
N	2680	2680	2680	2680	2680
p-values: Account Access Only = Education Only	0.40	0.25	0.89	0.82	0.60
p-values: Account Access Only = Account + Education	0.17	0.85	0.12	0.15	0.71
p-values: Education Only = Account + Education	0.03	0.15	0.12	0.08	0.40
p-values: Account Access Only + Education Only = Account + Education	0.04	0.43	0.33	0.10	0.12
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes	No
Panel B: Five-Year Endline					
Account Access Only	0.08	0.09	0.01	0.10	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
Education Only	0.07	0.01	-0.03	0.05	0.13
	(0.08)	(0.06)	(0.08)	(0.08)	(0.07)
Account + Education	0.02	-0.00	0.04	0.04	-0.06
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Control Group Mean	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00	1.00
N	1969	1969	1969	1950	1969
p-values: Account Access Only = Education Only	0.92	0.23	0.62	0.50	0.06
p-values: Account Access Only = Account + Education	0.32	0.18	0.66	0.35	0.34
p-values: Education Only = Account + Education	0.45	0.82	0.39	0.93	0.01
p-values: Account Access Only + Education Only = Account + Education	0.16	0.26	0.57	0.30	0.04
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes	No

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2-5 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 7. Treatment Effects on Financial Agency Index Components

	(1)	(2)	(3)	(4)
		Index Components		
	Financial Agency Index - Same as Table 1 Col 3	HH/Family would not be angry if saved alone	Involved in household's financial decisions	Always make decisions about own money
Panel A. One-Year Endline				
Account Access Only	-0.05	-0.02	-0.08	-0.01
	(0.06)	(0.06)	(0.06)	(0.06)
Education Only	0.01	-0.00	-0.01	0.03
	(0.06)	(0.06)	(0.06)	(0.06)
Account + Education	0.10	0.08	0.04	0.06
	(0.06)	(0.06)	(0.06)	(0.06)
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	2680	2680	2680	2680
p-values: Account Access Only = Education Only	0.25	0.81	0.27	0.45
p-values: Account Access Only = Account + Education	0.01	0.07	0.06	0.23
p-values: Education Only = Account + Education	0.12	0.15	0.41	0.67
p-values: Account Access Only + Education Only = Account + Education	0.10	0.23	0.13	0.69
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline				
Account Access Only	-0.03	-0.01	-0.08	0.03
	(0.07)	(0.06)	(0.07)	(0.06)
Education Only	-0.11	-0.21	-0.03	0.04
	(0.07)	(0.07)	(0.06)	(0.07)
Account + Education	0.08	-0.10	0.08	0.16
	(0.06)	(0.07)	(0.05)	(0.07)
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	1969	1968	1969	1968
p-values: Account Access Only = Education Only	0.26	0.01	0.52	0.96
p-values: Account Access Only = Account + Education	0.10	0.18	0.02	0.06
p-values: Education Only = Account + Education	0.01	0.14	0.05	0.11
p-values: Account Access Only + Education Only = Account + Education	0.02	0.22	0.04	0.38
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2-4 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 8. Treatment Effects on Bank Trust Index Components

	(1)	(2)	(3)
		Index Components	
	Financial Trust Index - Same as Table 1 Col 4	Trust that savings in formal bank would not be stolen	Trust that savings would be repaid if bank robbed
Panel A. One-Year Endline			
Account Access Only	-0.01	-0.01	-0.01
	(0.06)	(0.06)	(0.05)
Education Only	0.22	0.09	0.22
	(0.05)	(0.05)	(0.05)
Account + Education	0.32	0.21	0.25
	(0.05)	(0.05)	(0.06)
Control Group Mean	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00
N	2680	2680	2680
p-values: Account Access Only = Education Only	0.00	0.05	0.00
p-values: Account Access Only = Account + Education	0.00	0.00	0.00
p-values: Education Only = Account + Education	0.07	0.03	0.57
p-values: Account Access Only + Education Only = Account + Education	0.16	0.09	0.56
Proportion of Obs Equal Zero	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes
Panel B: Five-Year Endline			
Account Access Only	0.06	0.05	0.03
	(0.07)	(0.07)	(0.07)
Education Only	0.12	-0.00	0.16
	(0.06)	(0.06)	(0.06)
Account + Education	0.20	0.19	0.10
	(0.06)	(0.07)	(0.07)
Control Group Mean	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00
N	1969	1966	1968
p-values: Account Access Only = Education Only	0.39	0.44	0.04
p-values: Account Access Only = Account + Education	0.05	0.05	0.33
p-values: Education Only = Account + Education	0.19	0.00	0.35
p-values: Account Access Only + Education Only = Account + Education	0.77	0.12	0.36
Proportion of Obs Equal Zero	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 3-13 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 9. Treatment Effects on Savings Locations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total Number of Savings Locations	Pocket (1/0)	Box or Tin at Home (1/0)	Hidden Place at Home (1/0)	ROSCA (1/0)	Savings and Credit Co-operative (SACCO) (1/0)	Telecom Account (1/0)	Formal Group Account (1/0)	Formal Individual Account (1/0)	Another Person (1/0)	Resellable Assets (1/0)	Business Investment (1/0)
Panel A: One-Year Endline												
Account Access Only	0.09	0.01	-0.02	-0.01	0.04	0.01	-0.01	0.05	0.01	-0.01	0.01	0.00
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
Education Only	0.15	0.00	-0.00	-0.01	0.03	0.02	0.01	0.01	0.04	0.05	0.00	0.00
	(0.06)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
Account + Education	0.14	0.00	-0.02	0.02	0.05	0.00	0.00	0.06	0.04	0.01	0.00	0.00
	(0.06)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
Control Group Mean	1.28	0.04	0.19	0.21	0.10	0.14	0.03	0.01	0.16	0.16	0.12	0.04
Control Group SD	0.88	0.21	0.40	0.41	0.30	0.35	0.17	0.09	0.36	0.37	0.32	0.20
N	2680	2680	2680	2680	2680	2680	2680	2680	2680	2680	2680	2680
p-values: Account Access Only = Education Only	0.29	0.46	0.40	0.95	0.62	0.92	0.05	0.00	0.27	0.02	0.83	0.92
p-values: Account Access Only = Account + Education	0.36	0.37	0.92	0.33	0.53	0.70	0.33	0.47	0.34	0.46	0.84	0.97
p-values: Education Only = Account + Education	0.86	0.88	0.49	0.33	0.23	0.62	0.31	0.00	0.93	0.08	0.99	0.89
p-values: Account Access Only + Education Only = Account + Education	0.20	0.35	0.86	0.33	0.68	0.45	0.76	0.82	0.59	0.35	0.79	0.77
Proportion of Obs Equal Zero	0.14	0.95	0.81	0.79	0.88	0.85	0.97	0.96	0.82	0.83	0.88	0.96
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline												
Account Access Only	0.15	0.02	-0.00	-0.02	0.04	0.05	0.03	-0.01	-0.00	0.03	-0.00	0.02
	(0.09)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)
Education Only	0.12	0.01	-0.03	-0.01	0.01	0.02	0.01	0.02	0.02	-0.02	0.02	0.03
	(0.09)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Account + Education	0.18	-0.00	0.01	-0.01	0.01	0.03	0.00	0.00	0.04	0.04	0.03	0.03
	(0.08)	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.01)	(0.03)	(0.02)	(0.02)	(0.02)
Control Group Mean	1.60	0.07	0.18	0.14	0.20	0.20	0.15	0.04	0.21	0.08	0.13	0.09
Control Group SD	1.14	0.25	0.39	0.35	0.40	0.40	0.36	0.20	0.41	0.28	0.33	0.29
N	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956
p-values: Account Access Only = Education Only	0.77	0.58	0.44	0.58	0.19	0.45	0.43	0.06	0.44	0.05	0.36	0.57
p-values: Account Access Only = Account + Education	0.70	0.29	0.75	0.81	0.21	0.52	0.30	0.48	0.13	0.59	0.10	0.61
p-values: Education Only = Account + Education	0.49	0.58	0.25	0.76	0.95	0.84	0.80	0.21	0.41	0.00	0.48	0.97
p-values: Account Access Only + Education Only = Account + Education	0.50	0.31	0.36	0.70	0.27	0.30	0.31	0.51	0.51	0.26	0.52	0.47
Proportion of Obs Equal Zero	0.13	0.93	0.82	0.87	0.78	0.77	0.84	0.96	0.78	0.90	0.87	0.89
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators. We do not include the two savings locations with very low frequencies: "other" (1.9% for the one-year endline and 1.6% at the five-year endline) and "hole in ground" (0% at both endlines).

Appendix Table 10. Treatment Effects on Savings (Other Functional Forms)

	(1)	(2)	(3)	(4)
	Savings Balance ('000 UGX)			
	Top 1% Top-Coded	No Top-Coding	Top 5% Top-Coded	Inverse Hyperbolic Sine
Panel A. One-Year Endline				
Account Access Only	45.00	45.62	23.96	0.17
	(37.33)	(55.67)	(16.74)	(0.16)
Education Only	104.37	138.58	49.21	0.34
	(41.83)	(66.63)	(17.91)	(0.15)
Account + Education	44.30	8.51	38.80	0.37
	(33.59)	(43.68)	(17.15)	(0.13)
Control Group Mean	221.94	247.09	162.94	3.97
Control Group SD	606.00	867.99	296.60	2.44
N	2678	2678	2678	2678
p-values: Account Access Only = Education Only	0.14	0.18	0.14	0.27
p-values: Account Access Only = Account + Education	0.98	0.42	0.36	0.15
p-values: Education Only = Account + Education	0.10	0.03	0.55	0.82
p-values: Account Access Only + Education Only = Account + Education	0.05	0.03	0.16	0.48
Proportion of Obs Equal Zero	0.14	0.14	0.14	0.14
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline				
Account Access Only	99.26	-33.54	47.55	0.21
	(78.88)	(122.10)	(51.95)	(0.18)
Education Only	123.41	168.82	71.54	0.19
	(91.02)	(163.11)	(56.88)	(0.18)
Account + Education	188.15	302.58	107.03	0.39
	(84.08)	(211.54)	(53.78)	(0.17)
Control Group Mean	552.14	662.66	480.80	5.09
Control Group SD	1202.70	2202.81	853.50	2.57
N	1960	1960	1960	1960
p-values: Account Access Only = Education Only	0.79	0.16	0.69	0.95
p-values: Account Access Only = Account + Education	0.31	0.09	0.29	0.30
p-values: Education Only = Account + Education	0.50	0.55	0.56	0.25
p-values: Account Access Only + Education Only = Account + Education	0.78	0.51	0.88	0.98
Proportion of Obs Equal Zero	0.13	0.13	0.13	0.13
Controls for Baseline Values	Yes	Yes	Yes	Yes

Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 11. Treatment Effects on Income (Other Functional Forms)

	(1)	(2)	(3)	
	Total Income ('000 UGX)			
	Top 1% Top-Coded	No Top-Coding	Top 5% Top-Coded	Inverse Hyperbolic Sine
Panel A. One-Year Endline				
Account Access Only	31.06	28.45	23.13	0.09
	(16.22)	(34.60)	(13.07)	(0.11)
Education Only	32.45	29.92	26.63	0.26
	(16.44)	(31.16)	(13.16)	(0.11)
Account + Education	36.34	28.48	25.96	0.18
	(17.01)	(36.37)	(13.03)	(0.10)
Control Group Mean	200.79	233.86	180.99	4.50
Control Group SD	337.78	714.61	259.51	2.24
N	2661	2661	2661	2661
p-values: Account Access Only = Education Only	0.93	0.96	0.78	0.15
p-values: Account Access Only = Account + Education	0.76	1.00	0.82	0.38
p-values: Education Only = Account + Education	0.83	0.96	0.96	0.47
p-values: Account Access Only + Education Only = Account + Education	0.26	0.52	0.19	0.28
Proportion of Obs Equal Zero	0.11	0.11	0.11	0.11
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline				
Account Access Only	75.47	113.15	61.22	0.24
	(43.46)	(62.83)	(34.22)	(0.14)
Education Only	71.70	122.65	48.01	0.23
	(44.41)	(59.64)	(33.37)	(0.14)
Account + Education	95.13	177.40	86.54	0.36
	(43.15)	(96.51)	(32.86)	(0.14)
Control Group Mean	482.02	491.36	443.27	5.61
Control Group SD	673.52	739.64	533.12	2.30
N	1963	1963	1963	1963
p-values: Account Access Only = Education Only	0.94	0.89	0.72	0.96
p-values: Account Access Only = Account + Education	0.69	0.53	0.50	0.38
p-values: Education Only = Account + Education	0.64	0.60	0.29	0.35
p-values: Account Access Only + Education Only = Account + Education	0.43	0.63	0.65	0.59
Proportion of Obs Equal Zero	0.09	0.09	0.09	0.09
Controls for Baseline Values	Yes	Yes	Yes	Yes

Notes: Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 12. Treatment Effects on Expenditure and Consumption Index Components

	(1)	(2)	(3)	(4)
		Index Components		
	Expenditures and Consumption Index - Same as Table 4 Col 5	Human Capital Spending Last 12 months (UGX '000)	Total Spending Last 7 Days ('000 UGX)	Total Meals with Meat Last 7 Days
Panel A. One-Year Endline				
Account Access Only	0.02	0.03	-0.01	0.08
	(0.06)	(0.08)	(0.04)	(0.06)
Education Only	0.00	-0.01	0.01	0.09
	(0.04)	(0.05)	(0.05)	(0.05)
Account + Education	0.01	0.01	0.00	0.10
	(0.04)	(0.05)	(0.04)	(0.06)
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	2680	2674	2680	2679
p-values: Account Access Only = Education Only	0.79	0.53	0.60	0.78
p-values: Account Access Only = Account + Education	0.96	0.72	0.63	0.66
p-values: Education Only = Account + Education	0.71	0.56	0.88	0.84
p-values: Account Access Only + Education Only = Account + Education	0.96	0.88	0.91	0.41
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline				
Account Access Only	0.11	0.15	0.04	0.10
	(0.07)	(0.07)	(0.07)	(0.08)
Education Only	0.15	0.14	0.11	-0.01
	(0.08)	(0.07)	(0.10)	(0.08)
Account + Education	0.07	0.06	0.06	0.12
	(0.07)	(0.08)	(0.07)	(0.08)
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	1962	1915	1956	1969
p-values: Account Access Only = Education Only	0.63	0.91	0.50	0.19
p-values: Account Access Only = Account + Education	0.67	0.35	0.83	0.78
p-values: Education Only = Account + Education	0.39	0.40	0.60	0.11
p-values: Account Access Only + Education Only = Account + Education	0.11	0.05	0.42	0.79
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2-4 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 13. Treatment Effects on Patience Index Components

	(1)	(2)	(3)	(4)	(5)
		Index Components			
	Patience Index	Chose 6K USH in 2 weeks over 2K USH now	Chose 8K USH in 2 weeks over 2K USH now	Chose 4K USH in 2 weeks over 2K USH now	Chose 6K USH in 4 weeks 2K USH in 2 weeks
Panel A. One-Year Endline					
Account Access Only	0.04	0.04	0.03	0.02	-0.01
	(0.05)	(0.05)	(0.07)	(0.09)	(0.06)
Education Only	-0.02	0.02	-0.05	-0.10	0.00
	(0.06)	(0.06)	(0.07)	(0.09)	(0.05)
Account + Education	-0.04	-0.05	0.01	0.10	-0.09
	(0.06)	(0.06)	(0.07)	(0.09)	(0.06)
Control Group Mean	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00	1.00
N	2677	2677	1676	1007	2677
p-values: Account Access Only = Education Only	0.32	0.68	0.27	0.19	0.78
p-values: Account Access Only = Account + Education	0.17	0.11	0.83	0.40	0.16
p-values: Education Only = Account + Education	0.67	0.28	0.36	0.04	0.07
p-values: Account Access Only + Education Only = Account + Education	0.44	0.18	0.73	0.16	0.29
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline					
Account Access Only	0.07	0.09	0.09	0.07	-0.02
	(0.07)	(0.07)	(0.08)	(0.11)	(0.07)
Education Only	-0.09	-0.06	-0.08	0.02	-0.07
	(0.07)	(0.06)	(0.09)	(0.12)	(0.07)
Account + Education	-0.00	0.07	-0.01	-0.11	-0.05
	(0.07)	(0.07)	(0.08)	(0.11)	(0.07)
Control Group Mean	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00	1.00
N	1969	1969	1319	649	1968
p-values: Account Access Only = Education Only	0.02	0.03	0.04	0.61	0.41
p-values: Account Access Only = Account + Education	0.24	0.80	0.21	0.07	0.57
p-values: Education Only = Account + Education	0.24	0.04	0.39	0.28	0.78
p-values: Account Access Only + Education Only = Account + Education	0.92	0.63	0.87	0.21	0.70
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2-5 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 14. Treatment Effects on Self-Control Index Components

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Index Components					
	Self-Control Index	Future based time inconsistency: Pos. is more consistent	Present-biased time inconsistency): Pos. is more consistent	Plans to do things and postpones (Pos. less often)	Acts without thinking about results (Pos. less often)	Spends money received too quickly (Pos. less often)	Puts most of money in safe place to avoid spending it
Panel A. One-Year Endline							
Account Access Only	0.03	-0.06	0.02	0.02	0.11	-0.03	
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	
Education Only	0.01	-0.05	-0.02	0.01	0.09	0.00	
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)	
Account + Education	0.07	-0.02	0.03	0.09	0.02	0.05	
	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)	(0.06)	
Control Group Mean	0.00	0.00	0.00	0.00	0.00	0.00	
Control Group SD	1.00	1.00	1.00	1.00	1.00	1.00	
N	2680	2677	2677	2680	2680	2680	
p-values: Account Access Only = Education Only	0.81	0.93	0.51	0.78	0.80	0.48	
p-values: Account Access Only = Account + Education	0.40	0.55	0.80	0.26	0.13	0.14	
p-values: Education Only = Account + Education	0.26	0.62	0.39	0.18	0.18	0.32	
p-values: Account Access Only + Education Only = Account + Education	0.65	0.28	0.65	0.50	0.02	0.28	
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00	0.00	
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes	Yes	
Panel B: Five-Year Endline							
Account Access Only	-0.07	-0.09	0.07	-0.12	-0.05	-0.00	0.02
	(0.08)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.09)
Education Only	0.01	0.07	0.04	-0.04	-0.03	0.03	-0.07
	(0.08)	(0.05)	(0.07)	(0.07)	(0.07)	(0.07)	(0.09)
Account + Education	-0.03	-0.07	0.09	-0.14	-0.03	0.06	0.02
	(0.08)	(0.06)	(0.06)	(0.08)	(0.08)	(0.07)	(0.09)
Control Group Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00	1.00	1.00	1.00
N	1969	1968	1968	1967	1966	1969	1423
p-values: Account Access Only = Education Only	0.27	0.02	0.64	0.30	0.76	0.63	0.33
p-values: Account Access Only = Account + Education	0.62	0.78	0.77	0.73	0.73	0.39	0.95
p-values: Education Only = Account + Education	0.54	0.03	0.46	0.17	0.96	0.73	0.31
p-values: Account Access Only + Education Only = Account + Education	0.81	0.60	0.82	0.90	0.58	0.79	0.55
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes	Yes	Yes	No

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2-7 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 15. Treatment Effects on Risk Tolerance Index Components

	(1)	(2)	(3)	(4)
		Index Components		
	Risk Tolerance Index - Same as Table 4 Col 7	Less Risk Averse - 100% vs Coin	Less Risk Averse - Coin Choice	Less Risk Averse - Ambiguity
Panel A. One-Year Endline				
Account Access Only	0.02	0.02	0.04	-0.02
	(0.06)	(0.06)	(0.06)	(0.05)
Education Only	-0.07	-0.12	-0.00	-0.00
	(0.06)	(0.05)	(0.06)	(0.06)
Account + Education	-0.07	-0.04	-0.01	-0.07
	(0.06)	(0.06)	(0.06)	(0.05)
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	2677	2677	2674	2677
p-values: Account Access Only = Education Only	0.18	0.01	0.44	0.76
p-values: Account Access Only = Account + Education	0.16	0.30	0.40	0.32
p-values: Education Only = Account + Education	0.98	0.16	0.92	0.21
p-values: Account Access Only + Education Only = Account + Education	0.82	0.43	0.57	0.52
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes
Panel B: Five-Year Endline				
Account Access Only	0.11	0.02	0.05	0.15
	(0.06)	(0.06)	(0.07)	(0.06)
Education Only	0.04	-0.01	0.06	0.03
	(0.07)	(0.06)	(0.07)	(0.06)
Account + Education	0.08	0.07	0.06	0.05
	(0.07)	(0.06)	(0.06)	(0.07)
Control Group Mean	0.00	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00	1.00
N	1969	1965	1944	1968
p-values: Account Access Only = Education Only	0.30	0.66	0.86	0.07
p-values: Account Access Only = Account + Education	0.72	0.42	0.93	0.15
p-values: Education Only = Account + Education	0.52	0.19	0.92	0.76
p-values: Account Access Only + Education Only = Account + Education	0.52	0.45	0.54	0.17
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes	Yes

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2-4 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 16. Treatment Effects on Altruism Index Components

	(1)	(2)	(3)
		Index Components	
	Altruism Index - Same as Table 4 Col 8	Chose More Altruistic Money Option	Willing to Make Sacrifices for People Around Them
Panel A: One-Year Endline			
Account Access Only	-0.08	-0.06	-0.05
	(0.06)	(0.06)	(0.06)
Education Only	-0.05	-0.01	-0.07
	(0.06)	(0.06)	(0.05)
Account + Education	-0.10	-0.04	-0.11
	(0.06)	(0.06)	(0.06)
Control Group Mean	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00
N	2680	2677	2680
p-values: Account Access Only = Education Only	0.70	0.37	0.63
p-values: Account Access Only = Account + Education	0.73	0.70	0.35
p-values: Education Only = Account + Education	0.46	0.61	0.56
p-values: Account Access Only + Education Only = Account + Education	0.73	0.71	0.85
Proportion of Obs Equal Zero	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes
Panel B: Five-Year Endline			
Account Access Only	0.05	0.08	0.00
	(0.07)	(0.07)	(0.08)
Education Only	-0.01	-0.01	-0.02
	(0.08)	(0.07)	(0.08)
Account + Education	0.04	0.08	-0.01
	(0.08)	(0.07)	(0.08)
Control Group Mean	0.00	0.00	0.00
Control Group SD	1.00	1.00	1.00
N	2810	2810	2810
p-values: Account Access Only = Education Only	0.42	0.22	0.76
p-values: Account Access Only = Account + Education	0.90	0.99	0.84
p-values: Education Only = Account + Education	0.51	0.25	0.90
p-values: Account Access Only + Education Only = Account + Education	0.96	0.93	0.96
Proportion of Obs Equal Zero	0.00	0.00	0.00
Controls for Baseline Values	Yes	Yes	Yes

Notes: To calculate the index in Column 1 we take the mean of its non-missing components in Columns 2 and 3 (each of which has control group mean zero and SD 1) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.

Appendix Table 17. Treatment Effects on Other Mechanisms

	(1)	(2)	(3)	(4)	(5)
	Price Awareness Index	Basic Numeracy Index	Expected Future Standing in Community	Expects Emergency in Next 6 Months	Expects Emergency in Next 3 Months
Number of questions in index	8	3			
Panel A: One-Year Endline					
Account Access Only	-0.08	-0.03	0.09	0.01	0.05
	(0.07)	(0.06)	(0.13)	(0.03)	(0.03)
Education Only	0.08	0.02	-0.00	0.01	0.04
	(0.06)	(0.06)	(0.14)	(0.03)	(0.03)
Account + Education	0.10	0.07	0.34	0.03	0.05
	(0.07)	(0.05)	(0.13)	(0.03)	(0.03)
Control Group Mean	0.00	0.00	7.31	0.75	0.64
Control Group SD	1.00	1.00	2.11	0.43	0.48
N	2680	2680	2680	2680	2680
p-values: Account Access Only = Education Only	0.02	0.39	0.53	0.89	0.58
p-values: Account Access Only = Account + Education	0.02	0.07	0.06	0.52	0.93
p-values: Education Only = Account + Education	0.82	0.37	0.01	0.57	0.65
p-values: Account Access Only + Education Only = Account + Education	0.34	0.31	0.18	0.94	0.33
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.24	0.33
Controls for Baseline Values	No	Yes	Yes	No	No
Panel B: Five-Year Endline					
Account Access Only	0.01	-0.01	-0.05	0.03	-0.01
	(0.08)	(0.08)	(0.14)	(0.03)	(0.03)
Education Only	0.04	0.01	-0.07	0.01	0.01
	(0.08)	(0.07)	(0.14)	(0.03)	(0.03)
Account + Education	0.03	0.04	0.21	-0.02	0.02
	(0.09)	(0.07)	(0.13)	(0.04)	(0.03)
Control Group Mean	0.00	0.00	7.14	0.68	0.63
Control Group SD	1.00	1.00	1.93	0.47	0.48
N	1969	1969	1968	1965	1966
p-values: Account Access Only = Education Only	0.71	0.83	0.93	0.47	0.52
p-values: Account Access Only = Account + Education	0.78	0.52	0.07	0.14	0.22
p-values: Education Only = Account + Education	0.97	0.64	0.05	0.40	0.58
p-values: Account Access Only + Education Only = Account + Education	0.90	0.69	0.10	0.19	0.47
Proportion of Obs Equal Zero	0.00	0.00	0.00	0.31	0.36
Controls for Baseline Values	No	Yes	Yes	No	No

Notes: To calculate the indices in Columns 1 and 2 we take the mean of the index's non-missing standardized components (the components are not shown separately in this table) and then restandardize to SD=1 so that treatment effect estimates are in standard deviation units. Unit of observation is a club member-endline. Standard errors in parentheses, clustered at the unit of randomization (the youth club). Each column-panel in Panels A and B reports results for a single OLS regression of the dependent variable listed in the column heading on the treatment variables listed in the row headings (control group is the omitted category), the baseline value of the dependent variable if available (with a dummy for missing baseline value where needed), and the stratification variables for randomization: an indicator for the club's members having above median total savings at baseline and region indicators.