IMPACT STUDY

Evaluation of Root Capital's Financial Literacy Training Program for Sorghum Farmers in Ghana

root capital

ACKNOWLDGEMENTS

This study would not have been possible without the important contributions of many individuals and institutions. We would like to thank Faranaya and its employees for participating in this study and actively supporting its implementation, as well as the hundreds of smallholder sorghum farmers in Ghana who generously shared with us their time, perspective, and opinions. We're grateful to the entire Participatory Development Associates (PDA) team and enumeration staff who coordinated and conducted household surveys, and to Ibrahim Ouattara for his excellent oversight of data collection. This study benefited greatly from the technical guidance of our independent advisor, Dan Stein. We also thank the numerous Root Capital staff whose work on this study was instrumental, including colleagues from our Lending, Advisory, Creative, and Impact teams. Finally, we'd like to extend our gratitude to the Mastercard Foundation, whose partnership and generous support made this study possible.

Authors:
Isabel DoCampo and Katie Naeve (Root Capital)
Raymond Hodor, Alexander Afram, and Clement Sefa-Nyarko (Participatory Development Associates)

Contact:
Root Capital
245 Main St, 2nd Floor
Cambridge, MA 02142
(617) 444-4545
knaeve@rootcapital.org

CONTENTS

EXECUTIVE SUMMARY

Root Capital

Root Capital invests in the growth of agricultural enterprises so they can transform rural communities. These businesses purchase crops such as coffee, cocoa, or grains from smallholder farmers. With growth, they become engines of impact that can raise incomes, create jobs, empower women and young people, and preserve vulnerable ecosystems. We supply these businesses with vital resources: access to capital, trade and technical partners, financial training, and conservation practices. We work in hard-to-serve geographies where others don't. To date, we've distributed $1.6 billion to improve the lives of 10 million people in farming communities.

The Mastercard Foundation-Root Capital Partnership

Since 2014, Root Capital and the Mastercard Foundation have partnered to bring essential financing and capacity building to agricultural businesses in West Africa. The latest phase of our partnership, *Expanding the Frontier of Agricultural Finance in West Africa*, began in 2016. Under this initiative, we aimed to achieve three main objectives:

1. Accelerate the bankability and growth of more than 100 high-impact, early-stage agricultural businesses with capital needs under $150,000 and/or business revenues under $300,000;
2. Pilot an expanded set of advisory services, including leadership development for agribusiness employees; financial literacy training for smallholder farmers; mobile technology and mobile money; and local microfinance institution empowerment programs to better serve the agricultural sector; and
3. Contribute to sector learning by developing a framework for documenting and analyzing the costs and impacts associated with early business growth in the agricultural sector.

Purpose of the Study

Root Capital partnered with Participatory Development Associates (PDA)—a research and evaluation firm based in Ghana—to conduct evaluations with two Ghanaian businesses that Root Capital reached with the support of the Mastercard Foundation. These evaluations—conducted with Serendipalm, an oil palm aggregation and processing firm, and Faranaya, a domestic sorghum aggregator—measure Root Capital's impact on the businesses, as well as

each businesses' impact on their suppliers and communities.[1] These enterprises represent diverse segments of Root Capital's portfolio and present a unique learning opportunity about Root Capital's impact.

Root Capital evaluated two engagements with **Faranaya:** 1) the provision of loans and advisory services on various aspects of financial management and 2) Root Capital's Farmer Financial Literacy training, a direct-to-farmer program which sought to build farmers' basic understanding of financial management and farm profitability. This report focuses on that second engagement, exploring the efficacy of the Farmer Financial Literacy training for farmers associated with Faranaya. This report analyzes changes to these farmers' financial knowledge and behaviors as well as their satisfaction with training.

Study Approach

In 2018, Root Capital piloted the Farmer Financial Literacy training with suppliers of Faranaya and conducted a randomized controlled trial to evaluate its impact. The training, which focused on numeracy, microfinance contract negotiation, and debt management, was structured such that a Root Capital consultant trained lead farmers to teach financial literacy concepts to larger groups of farmers affiliated with Faranaya in their villages. Each lead farmer trainer was responsible for a specific village; in total, they reached 400 fellow farmers across 28 villages. Training participants were randomized by village into treatment and control groups. Trainers assigned to treatment villages were to complete their trainings by April 2018, at which time we conducted a midline survey to compare learning outcomes between individuals in the treatment and control communities. Trainers assigned to control villages completed their trainings by December 2018. All farmers were surveyed again in March 2020 to evaluate learning retention. By regressing key outcomes in our April 2018 midline data on treatment status, we estimated the impact of the Farmer Financial Literacy training. We also analyzed summary statistics regarding changes over time in our treatment and control groups between February and April 2018 and March 2020.

Root Capital and PDA co-implemented the evaluation, with each responsible for different aspects to ensure its successful completion. Root Capital staff led client engagement, provided guidance on data collection, and conducted methodological design, data analysis, and report writing. PDA staff assisted in methodological development, managed data collection in the field, conducted data analysis, and co-authored this report.

[1] The findings from our study with Serendipalm can be found on Root Capital's website.

Main Findings

The randomized controlled trial of Root Capital's Farmer Financial Literacy training for farmers associated with Faranaya revealed mixed results on program efficacy. Farmers reported a high degree of satisfaction with the content of the training, but we found only modest gains in financial literacy at midline among farmers who received the training. We found that training participants were more likely than nonparticipants to hold savings accounts at midline, indicating that the training may have encouraged participants to obtain such accounts. However, we found no relationship between the training and likelihood of receiving insurance, nor a significant increase in credit access or comfort in obtaining loans among training participants. We found no change in nonbank borrowing among participants, and found no robust impact of the training on overall financial satisfaction.

These findings highlight several opportunities for Root Capital and other organizations aiming to improve farmer financial literacy through training. Some lead farmers did not participate in the initial training sessions due to logistical reasons; by providing financial incentives and transportation options to lead farmers, we can increase their participation in those sessions. Future interventions could also test these lead farmers after their initial training to ensure that they have sufficient comprehension of financial literacy before they lead group trainings. In qualitative interviews, some participants reported that it was difficult to retain information learned in training; future training could be improved by distributing take-home materials that summarize the content of each session to lead farmers and participants. These adjustments would likely improve the efficacy of the Farmer Financial Literacy training, which was highly regarded by participants, but achieved only modest impacts on participant financial knowledge and behavior.

INTRODUCTION

Faranaya

Located in the Garu District of Ghana's Upper East Region, Faranaya Agribusiness Centre Ltd. was founded in 2012. Faranaya sells sorghum to one buyer, Guinness Ghana Brewery Ltd. (GGBL), a multinational brewery that has operated in Ghana for several decades. Since its relationship with GGBL began in 2012, Faranaya has directly supplied 7,000 metric tons of sorghum to the brewery. Faranaya sources sorghum from approximately 3,000 smallholder sorghum farmers, 40% of whom are women. Faranaya aims to provide its suppliers with consistent market access for their sorghum; the enterprise also promotes optimal sorghum production and community food security.

Faranaya offers its suppliers various programs to maximize their sorghum yields. The business performs on-farm internal inspections for over 75% of its suppliers, as well as centralized trainings on optimal sorghum practices for over half of suppliers. Faranaya began an input support program in 2011, which provides a segment of suppliers with inorganic fertilizer. For the past five years, Faranaya has assisted suppliers in obtaining microcredit and basic financial education from Bawku East Small-Scale Farmers Association (BESSFA) Rural Bank—a local microfinance institution. The enterprise also provides suppliers with an alternative income generation program focused on vegetable production, as well as entrepreneurship programs for women and youth. Employees at Faranaya, meanwhile, benefit from health insurance and pension benefits.

Root Capital has delivered a variety of services to Faranaya since 2013, when we approved a $240,000 loan for general working capital. Between 2014 and 2019, Root Capital extended five additional loans to Faranaya. Since 2013, Root Capital has also advised the business on various topics related to financial management. The enterprise has also participated in Root Capital pilot projects on fertilizer provision and mobile weather alerts. The mobile weather alerts program involved a partnership with Ignitia—a global weather forecasting firm—whereby farmers received text messages regarding local weather updates.

Farmer Financial Literacy Training

Between harvests, farmers require capital for farming inputs and income-generation opportunities. Too often, smallholder farmers lack the numeracy and financial literacy skills needed to access those resources. To confront this issue, Root Capital developed the Farmer Financial Literacy training—a program focused on building farmers' knowledge of numeracy,

financial planning and products, microfinance contract negotiation, and debt management. Root Capital hypothesized that with improved financial literacy, farmers could negotiate mutually beneficial financial service contracts, apply for and use more credit, better manage loans, and enjoy greater satisfaction with their financial services.

In 2018, Root Capital piloted the Farmer Financial Literacy training with approximately 400 Faranaya suppliers. Root Capital staff developed topics for this training with information from diagnostic interviews with farmers associated with Faranaya. Farmers expressed interest in training on numeracy, contract negotiation, and interactions with BESSFA Rural Bank—a local commercial bank that Faranaya has worked with to facilitate farmer access to financial services. Under the program, a Root Capital consultant trained "lead farmers" on the skills needed to teach financial literacy concepts. Following this training, those lead farmers would be equipped to train larger groups of farmers without Root Capital oversight. Faranaya selected lead farmers from their supplier base using several criteria, including English language skills, community visibility, and training experience. During a three-day training, lead farmers received instruction from a Root Capital consultant on relevant financial literacy concepts and developed training workplans and timelines. Each lead farmer was assigned to train peer farmers in one of 28 villages. Faranaya selected 500 farmers to participate in the Farmer Financial Literacy training based on their strong performance in their credit program—401 of these were available to participate. Lead farmers then provided the training to these participants in central locations in each village over a three-day period.

Evaluation Objectives

This evaluation of the Farmer Financial Literacy training seeks to measure:

- The efficacy of the training in building numeracy and financial literacy of smallholder sorghum farmers supplying to Faranaya.
- The impacts of the training on farmers' financial knowledge and their access, use, management, and satisfaction with microfinance products.

The findings of this evaluation will inform the structure and content of any potential future direct-to farmer financial literacy trainings implemented by Root Capital.

METHODOLOGY

Evaluation Approach

To evaluate the impact of the Farmer Financial Literacy training on farmers' financial knowledge and skills, Root Capital partnered with PDA to conduct a randomized controlled trial. Correctly implemented, this methodology—which involves comparing outcomes between a randomly selected treatment group (which received the intervention) and a control group (which did not)—allows us to attribute any post-intervention differences between the two groups to the training itself.

Prior to the intervention, we randomized the 401 farmers available to participate in the Farmer Financial Literacy training into treatment and control groups. Randomization was conducted at the village level. Each of the 28 villages was randomly assigned to either the treatment or control group, with 14 in each group. We conducted a baseline survey with 196 farmers from the treatment villages and 205 farmers from control villages in February 2018, prior to the training. The baseline survey contained questions on demographics, personal financial management, experience and satisfaction with financial services, and financial literacy which helped us to understand farmers' financial literacy and behaviors and to check whether the two groups were balanced pre-intervention.

In February 2018, Root Capital trained the lead farmers assigned to treatment villages; these lead farmers then trained their assigned farmers by March 2018. In April 2018, we conducted a midline survey to compare learning and behavioral outcomes between individuals in the treatment and control communities. A total of 375 farmers (184 in the treatment group and 191 in the control group) were surveyed at midline. Of farmers who participated in the baseline, 6.5% could not be reached for an interview at the midline. The midline survey included questions on training attendance and satisfaction, in addition to questions on personal financial management, experience and satisfaction with financial services, and financial literacy.

To estimate the impact of the Farmer Financial Literacy training, we conducted ordinary least squares (OLS) regressions of key individual outcomes related to financial literacy, use of financial services, and financial satisfaction on treatment status at midline. These regressions controlled for variables where we observed statistically significant differences between the treatment and control groups at baseline, and included standard errors clustered at the village level. More information on our regression specifications, as well as regression output tables, are located in Section 2 of the Appendix.

The evaluation used a phase-in randomization approach so that all farmers—treatment and control—would receive the training. Lead farmers assigned to control villages were intended to be trained in November 2018 before providing training to farmers in their assigned villages between November and December 2018 (see below section, *Methodological Challenges*, for more information). In March 2020, we conducted an endline survey—after all participants should have received the Farmer Financial Literacy training—with 357 farmers (166 treatment and 191 control), representing 89% of baseline participants. This survey contained similar questions to the baseline and midline questionnaires plus questions about additional financial literacy trainings received between 2018 and 2020. We used this data to analyze continued impact and changes over time in the treatment and control groups between February 2018, April 2018, and March 2020 using summary statistics.

Methodological Challenges

We encountered some difficulties in randomization adherence, training implementation, and data collection that could influence our study results. The program was designed so that trainers assigned to control villages would not be trained until November 2018, to ensure that no farmers in the control group would be trained prior to the March 2018 midline survey. However, 10 comparison trainers mistakenly attended and were trained in March 2018. These erroneously-trained lead farmers were asked to not provide any training to farmers in their villages until November 2018, but it is possible that they shared relevant information with members of control villages prior to the midline survey. If control individuals received training information earlier than planned, our results may underestimate the effect of the training.

Any lead farmer from the control group who was trained too early was not retrained with the rest of the control group in November 2018. Therefore, it is also possible that the quality of some trainings was negatively impacted by the amount of time—approximately nine months—that elapsed between lead farmer training and their trainings with participant farmers. This issue may explain why control individuals performed worse than treatment individuals on some outcomes at endline, even after both groups were trained.

Additionally, lead farmer participation in the March 2018 training—intended for lead farmers working with the treatment group—was very low during the first two days of the three-day session. Ultimately, only 70% of lead farmers in the treatment group participated fully in their intended training. Low initial levels of trainer attendance were due to a number of factors: Trainings were conducted at central locations that were too far or expensive for some lead farmers to reach; lead farmers also appeared to lack information about the timing of their assigned trainings during the first two days of the training event. Midway through the training, Faranaya began offering transportation and Root Capital reimbursed the travel expenses of

lead farmers; Faranaya also took steps to improve communication with lead farmers on when sessions were taking place. These measures helped increase lead farmer participation by the end of the three-day training period. However, it is likely that many trainers did not receive the full training and that study participants therefore did not receive the Farmer Financial Literacy training as intended. This issue was further exacerbated by a natural limitation of this training-of-the-trainers model: Root Capital had little control over the quality of and attendance at the trainings run by lead farmers in their villages. It may be that trainers did not adequately convey financial literacy concepts to participants, negatively impacting the potential of the training to change knowledge or behaviors.

We also observed some attrition between baseline, midline, and endline surveys. Around 11% of respondents we interviewed at baseline could not be reached at endline. Some farmers had moved, had passed away, could not be contacted, or refused to participate in subsequent surveys. Although this attrition could bias our study results, our differential attrition analysis (presented in Appendix Section 1) found little difference between the individuals who left the study and the sample observed at baseline.

FINDINGS

Summary Statistics

The following paragraphs contain summary statistics on the 322 farmers across the treatment and control groups who participated in baseline, midline, and endline surveys. Randomization yielded treatment and control groups that were statistically similar on many observed demographic characteristics and most farm-level characteristics. Data on randomization success in the full baseline sample—as well as an assessment of differential attrition between baseline and midline—are available in the Appendix.

Seventy-seven percent of treatment respondents were male, compared to 71% of control respondents. Treatment respondents were an average of 50 years old at baseline while control respondents were an average of 48 years old. In both groups, 93% of respondents were married. Treatment respondents at baseline had farmed sorghum for an average of seven years and supplied to Faranaya for an average of four years. Control respondents had farmed sorghum for an average of six years and supplied to Faranaya for four. None of these differences between the treatment and control groups were statistically significant.

At baseline, treatment and control farmers both dedicated 2.7 acres of land on average to sorghum production. Treatment farmers produced an average of 671 kilograms of sorghum while control farmers produced an average of 504 kilograms. This was one of the few statistically significant differences found between the treatment and control groups at baseline; this difference could be driven by a large amount of missing data regarding production among control respondents. At baseline, treatment farmers reported earning an average of 697 Ghanaian cedis from sorghum production in the most reason season and 2,575 Ghanaian cedis in total household income that year. Control farmers reported an average of 706 Ghanaian cedis from sorghum production in the most reason season and 2,505 Ghanaian cedis in total household income that year.

Table 1: Demographic Characteristics by Treatment Status, February 2018

Variable	RCT Treatment Group		RCT Control Group		T-Statistic
	Obs	Mean	Obs	Mean	
Male	153	0.7712	169	0.7101	-1.2477
Age	153	50.39216	169	47.68047	1.6006
Married	153	0.9346	169	0.9290	0.1999
Years in Sorghum	153	6.673203	169	6.47929	0.4369
Years Supplying Faranaya	153	3.895425	169	3.852071	0.1328
Sorghum Farm Size	153	2.69281	169	2.664497	0.1479
Sorghum Production	147	670.9388	90	503.7444	**2.0582**
Sorghum Income	143	697.1538	163	706.1718	-0.1125
Total Household Income	150	2575.753	169	2505.586	0.1896

At baseline, 24% of treatment group members reported that they maintained a household budget, compared to 26% of control farmers. Eighty-seven percent of treatment farmers reported that they were able to save money, compared to 93% of control farmers. As per Table 2, this difference was statistically significant. Seven percent of treatment farmers had a checking account at baseline, 31% had a savings account, 58% saved through a savings group, 23% held a loan, and 7% had insurance. Seven percent of control farmers had a checking account, 33% had a savings account, 72% saved through a savings group (a statistically significant difference), 21% held a loan, and 10% had insurance. Treatment farmers scored an average of 8.5 points (out of 22 total) on a quiz related to their financial literacy, while control farmers averaged 8.6 points. This difference was not statistically significant.

Table 2: Financial Characteristics by Treatment Status, February 2018

Variable	RCT Treatment Group		RCT Control Group		T-Statistic
	Obs	Mean	Obs	Mean	
Household Budget	153	0.2418	169	0.2604	-0.3815
Saving	153	0.8693	169	0.9349	**2.0000**
Checking Account	153	0.0718954	169	0.0650888	0.2410
Savings Account	153	0.3137255	169	0.3254438	-0.2245
Savings Group	153	0.5751634	169	0.7218935	**-2.7853**
Loan	153	0.2287582	169	0.2071006	0.4692
Insurance	153	0.0653595	169	0.1005917	-1.1379
Financial Literacy Knowledge Score	153	8.48366	169	8.64497	-0.3739

Intervention Coverage

At midline, 70% of farmers in the treatment group confirmed that they had received training from a lead farmer on budgeting, contracting, and financial literacy. However, Root Capital records indicated that 86% of this group had received the training by this time. At midline, of the individuals in the treatment group who did not report receiving the training, 21% indicated that they had received information on these subjects from formally trained members of their village within the past two months. This finding indicates some degree of spillover; it is possible that some of these treatment farmers were unable to attend the formal trainings, but got the information later from friends or neighbors who had attended.

Nearly 2% of control farmers reported receiving a formal training from Faranaya on budgeting, contracting, and financial literacy between the baseline and midline, despite the fact that they should not have received any training. Just over 1% of control individuals indicated that they received information on these subjects from formally trained farmers in their village. Per our study design, no control farmers should have received the Farmer Financial Literacy training at the time of the midline survey in April 2018. However, any of the following might have occurred prior to the midline survey: control farmers could have attended trainings in treatment villages; farmers in the treatment group could have visited control villages and shared information with friends or other contacts; or the 10 mistakenly trained lead farmers for the control group could have trained some farmers in their communities too early. We do not have records available to confirm which of these options may have occurred. At the endline survey (at which point farmers in both the treatment and control groups should have received the training), 49% of control farmers reported that they had attended a Farmer Financial Literacy training in 2018, indicating that the treatment did not reach all intended recipients.

Given that, at midline, 30% of treatment individuals had not received the Farmer Financial Literacy training as intended and 2% of control individuals may have, the following findings represent an intent-to-treat analysis of outcomes in the originally designated treatment and control groups. As a result, the findings presented below may reflect an underestimate of the true impact of the Farmer Financial Literacy training.

It's also important to consider that after midline, it is possible that study participants received training on financial literacy from other sources. Forty-eight percent of treatment farmers and 42% of control farmers reported that they had received additional trainings on financial literacy between 2018 and 2020, beyond those provided by Root Capital. As a result, endline results could consider the impacts of financial literacy information provided to participants from other sources.

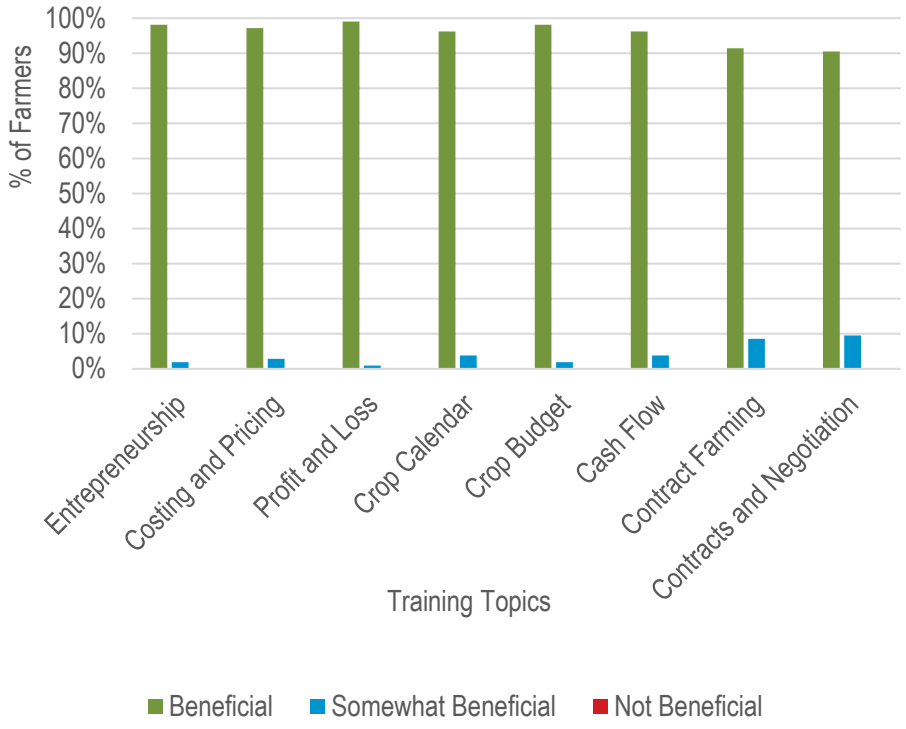
Intervention Impacts

Participants reported a high degree of satisfaction with the training. We also identified positive associations between training participation, financial literacy, and the use of some formal financial services. We did not identify significant impacts of the training on credit use and financial satisfaction.

FINDING 1: At midline, we found that the majority of training attendees were satisfied with the format and content of the Farmer Financial Literacy training.

At midline, 95% of treatment respondents who reported attending the Farmer Financial Literacy training indicated that they were "very satisfied" with the session. As Figure 1 demonstrates, nearly all respondents felt that each area of the training was beneficial. Less than 10% of respondents indicated that the contract farming and contract negotiation components of the training were "somewhat beneficial."

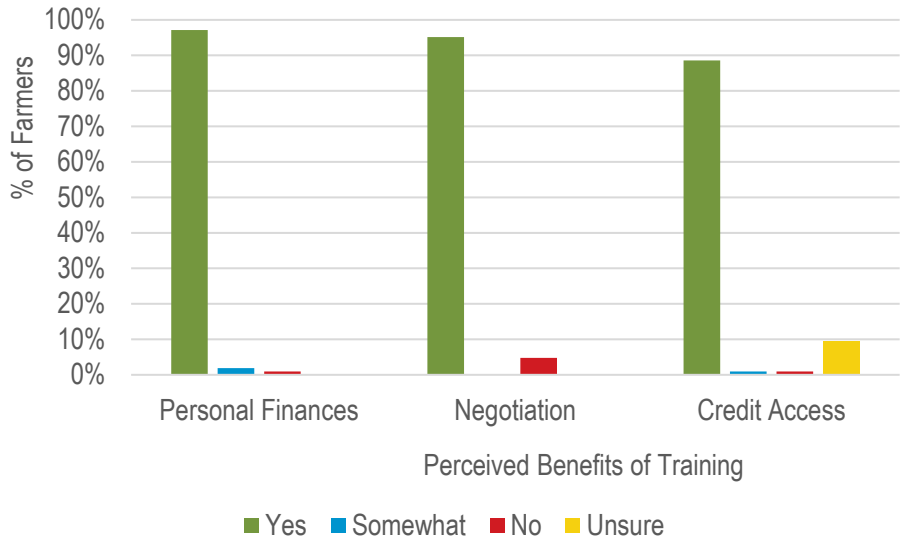
Figure 1: Benefit of Training Topics



The overwhelming majority of farmers reported that they believed the training would improve their ability to manage farm and household finances, farm negotiations, and interactions with financial service providers (Figure 2). The PDA team also captured qualitative reactions to the training from select participants. These farmers described how the training helped them learn

to budget and keep formal records of farm and household finances. Many of them reported that it was the first training on financial literacy they had ever received. One farmer noted that the budgeting training inspired greater financial transparency in their family.

Figure 2: Perceived Benefits of Training



We asked respondents to rate the format, convenience, and level of difficulty of the training. Ninety-nice percent of respondents reported that training material was delivered in an effective format. As shown in Figure 3, 60% of respondents rated the level of difficulty of the training as "just right;" 16% rated the content as "too easy," while 14% found it "too difficult." Women and youth (participants age 35 or younger) were more likely than men and older individuals to find the training too easy, with 27% of women and 33% of youth responding as such.

Figure 3: Training Level of Difficulty

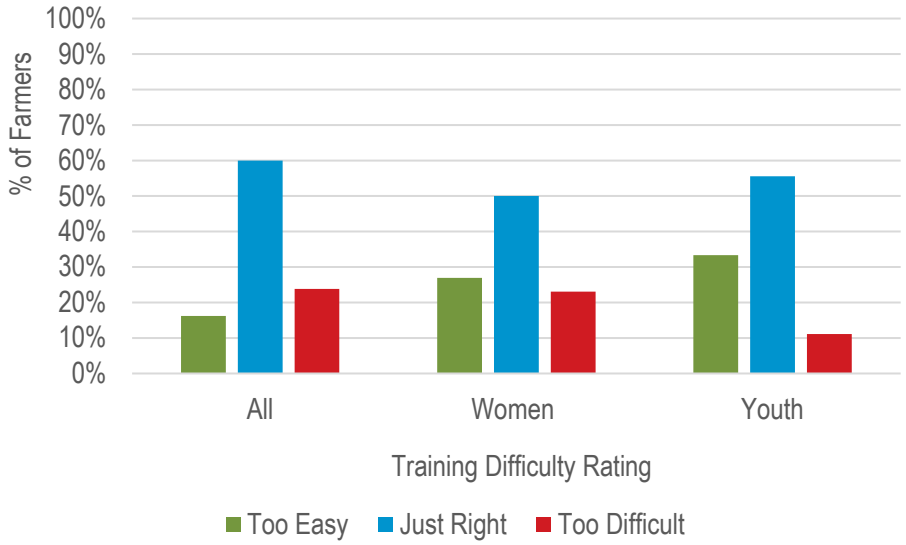
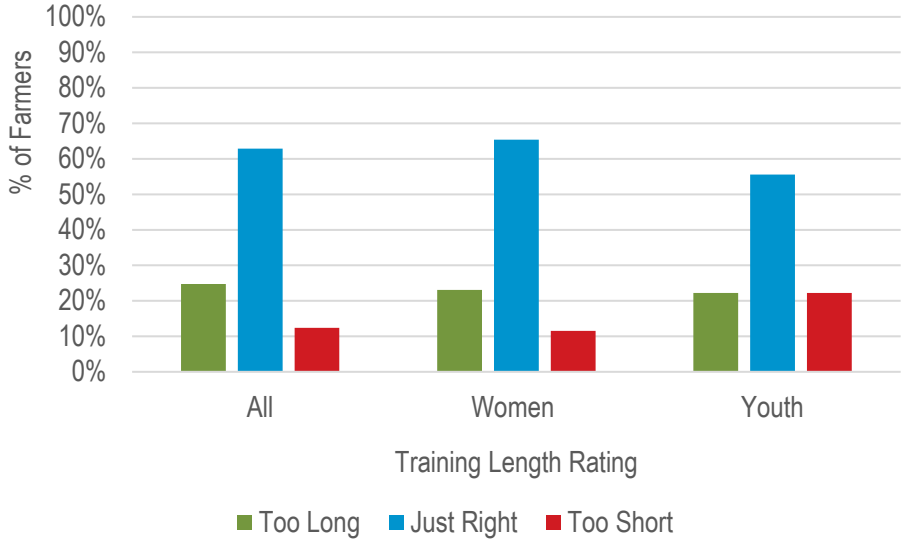
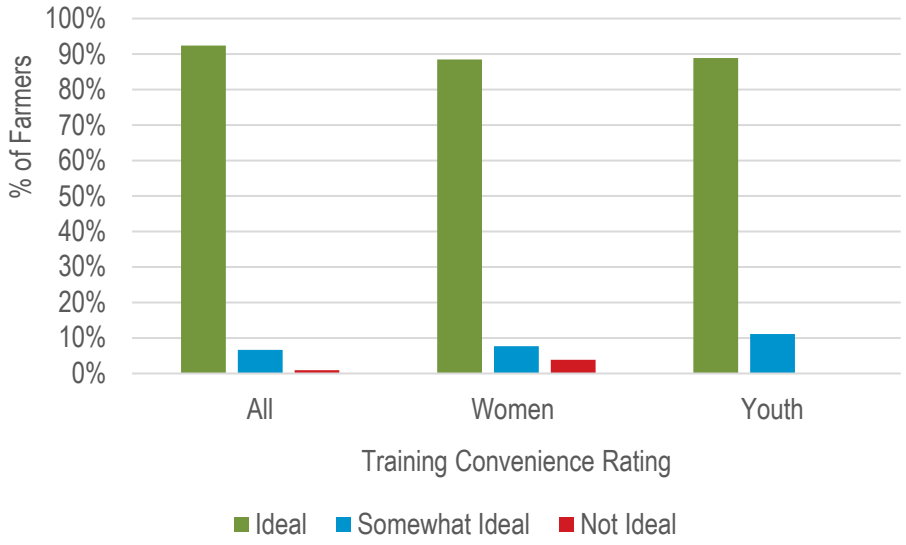


Figure 4: Training Length



The training lasted three full days, with 60% of individuals indicating that three days was an appropriate amount of time, and 23% reporting that the training was too long (Figure 4). Seventy-nine percent of respondents attended all three days of training; this metric did not vary significantly by gender or youth status. Over 90% of respondents reported that the dates of the training were ideal (Figure 5).

Figure 5: Convenience of Training Dates



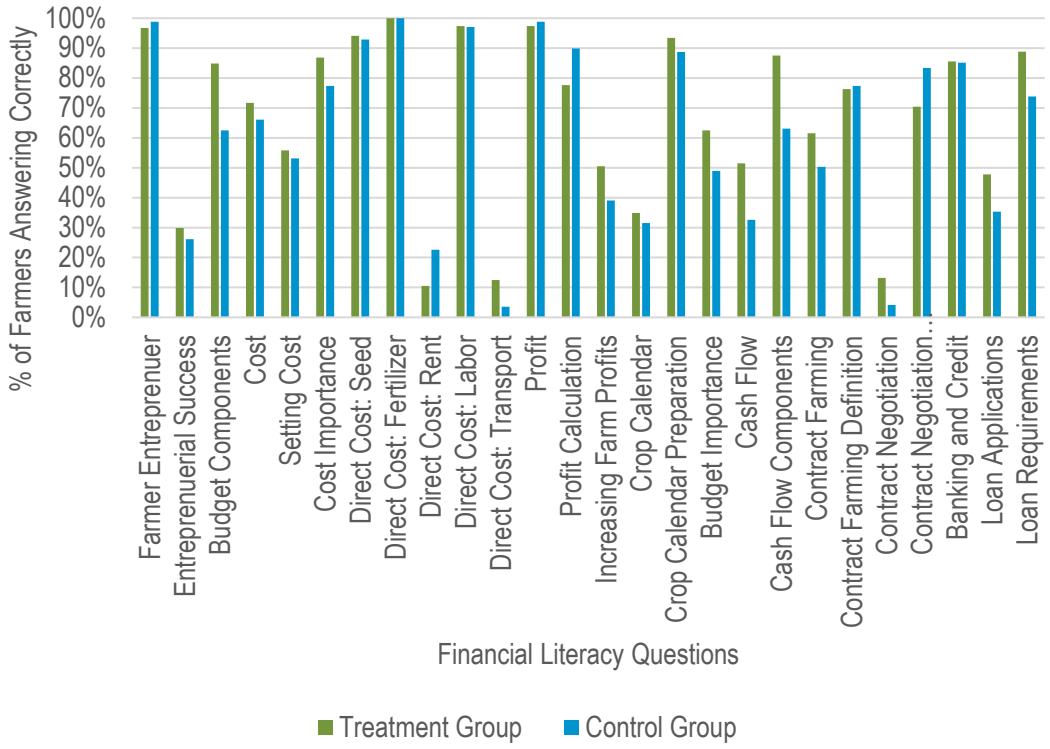
FINDING 2: We observed modest impacts of the training on participants' financial literacy.

At midline, we tested respondents' knowledge on the financial literacy topics covered in the Farmer Financial Literacy training. This test included 26 questions on the definitions and application of concepts such as cash flow, loan applications, crop calendars, budgets, and contract negotiations. As per Figure 6, financial literacy in both the treatment and comparison groups was relatively high at midline, with more than half of respondents answering at least 17 out of 26 questions correctly. The majority of respondents in the treatment and comparison groups answered questions incorrectly about: the skills required to be an entrepreneur; what constitutes a 'direct cost' in production; and the negotiation process. These areas of the training may require improvements to result in substantive farmer learning.

Regressions assessing the impact of treatment status on quiz score (while controlling for baseline financial literacy and baseline savings behavior) indicated that treatment farmers scored an average of seven percentage points higher than did comparison farmers at midline (statistically different from zero at 99% confidence). There was no difference in financial literacy quiz score by gender or youth status. The average quiz score in the treatment group at midline was 56%, while the average quiz score in the control group was 49%. Ten individuals (6.5%) in the treatment group scored above 70% on the assessment. Just three individuals in the comparison group (1.8%) scored 70% or higher. In particular, treatment individuals

outperformed control respondents on questions related to budgets, cash flow, and loan applications.

Figure 6: Financial Literacy Question Responses by Treatment Status



Overall, it appears that the treatment was successful in increasing participant knowledge of financial literacy topics. However, because few individuals scored above 70% at midline, it could be that either participants did not fully absorb training on these topics, or learnings were not retained between the training and the midline survey. Indeed, participants in qualitative interviews indicated that it was difficult to remember all of the content shared during the training. Distributing materials for participants to keep and refer to post-training might be helpful in ensuring that lessons are retained in the long term.

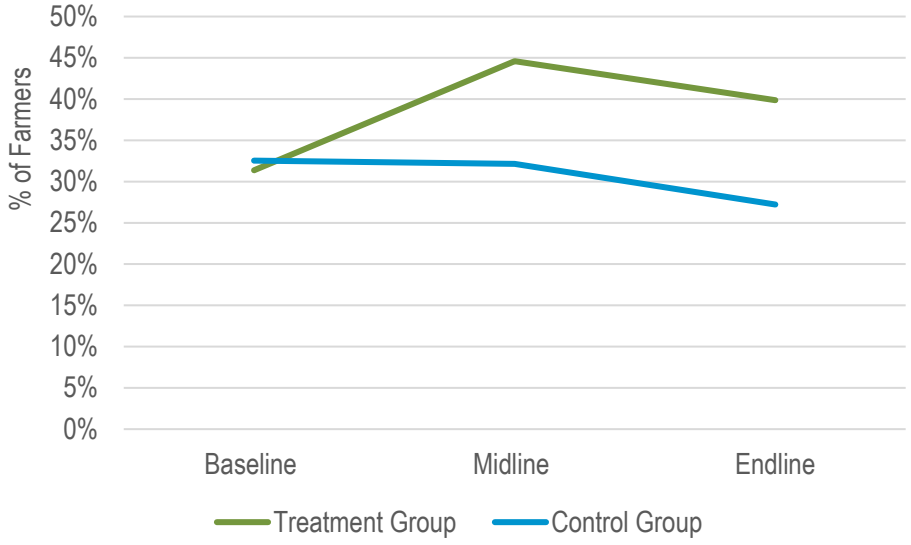
FINDING 3: Treatment group members were more likely to participate in some formal financial services than control group members at midline, though we found no notable differences on borrowing behavior by treatment status.

Use of Financial Services

During the midline assessment, we asked farmers about their interaction with formal financial services. We found ambiguous effects of the training on the likelihood of holding a savings

account. At midline, treatment group respondents were 12 percentage points more likely than control respondents to report holding a savings account (statistically different from zero at 95% confidence), suggesting that the training may have influenced farmers' ability to acquire—or interest in acquiring—a savings account. However, control group members were less likely to hold savings accounts at endline than they were at midline, even though they should have received the Farmer Financial Literacy training during that period. Treatment group farmers experienced a similar decline in the likelihood of holding a savings account between midline and endline. It is possible that the training did not exert a lasting impact on the likelihood of holding a savings account; it also could be an external event in the Garu community, unrelated to the training, led to a decline in savings across groups between midline and endline.

Figure 7: Savings Account by Treatment Status



Per Figure 8, we found no difference on the likelihood of participating in a savings and loan group by treatment status at midline, nor did we identify a statistically significant difference on the likelihood of holding insurance (Figure 9). Relative to midline, treatment farmers were significantly more likely to hold insurance at endline, while insurance holdings among control farmers declined slightly over the same period. Given these inconsistent trends in insurance holdings among training participants, it appears as though factors other than the training influenced insurance holdings.

Figure 8: Savings and Loan Group by Treatment Status

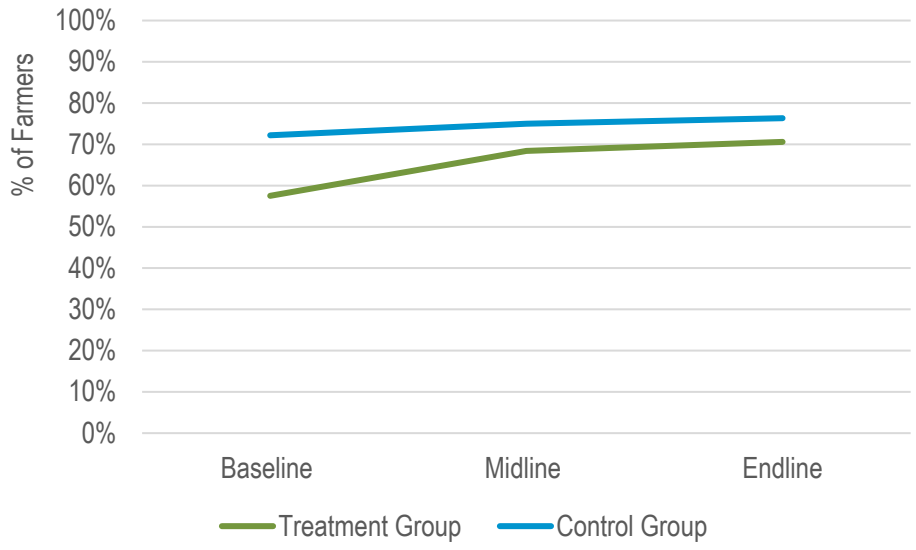
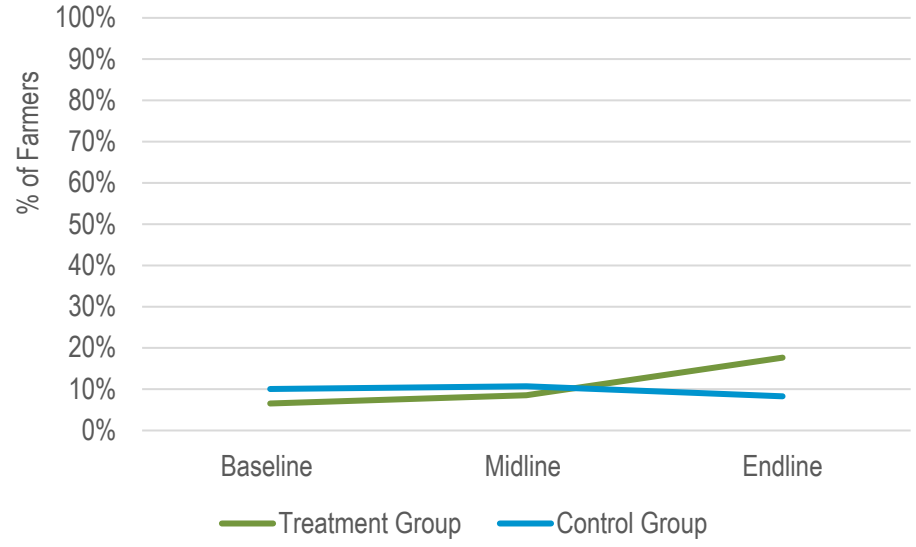


Figure 9: Insurance by Treatment Status



Lending Needs and Preferences

We asked farmers about their interactions with formal and informal lending services. At midline, treatment farmers were 15 percentage points more likely than control farmers to report

holding an active loan (statistically different from zero at 99% confidence). However, this difference was mostly driven by a significant decline in loan holdings among control farmers between baseline and midline (Figure 10). Per Figure 11, the majority of farmers indicated that they felt they could access a loan if they needed one. We identified no statistically significant difference by treatment status on this outcome, but youth farmers were more likely than others to report access to loans.

Figure 10: Currently Held Loan by Treatment Status

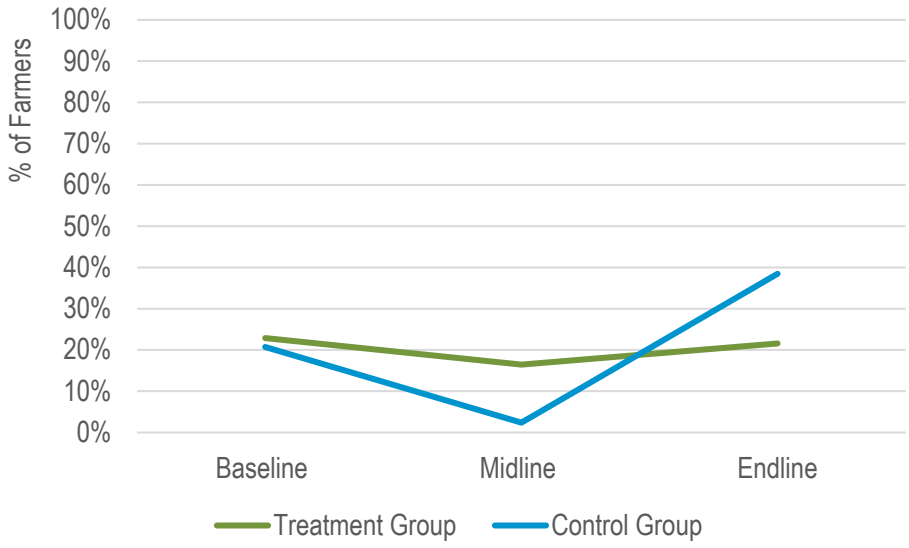
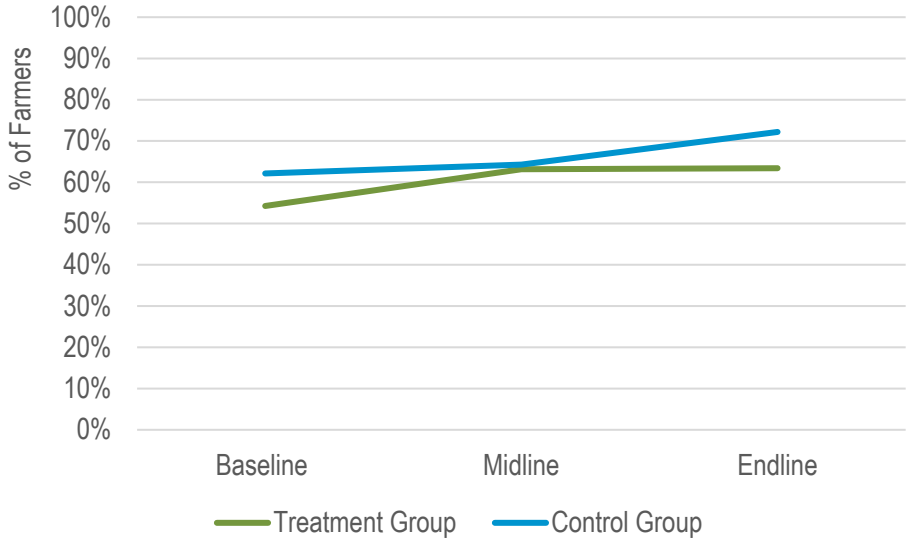


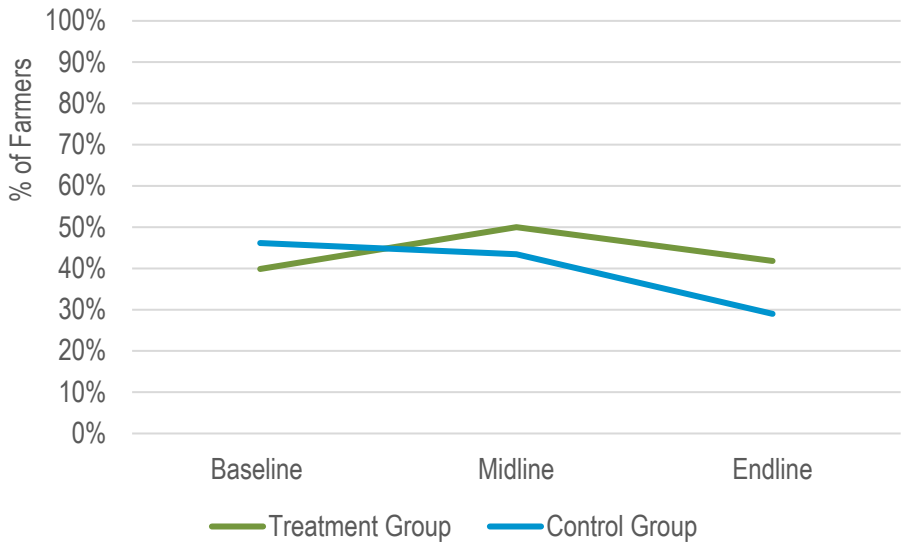
Figure 11: Ready Loan Access by Treatment Status



Fewer than half of the surveyed farmers, however, indicated that they felt comfortable taking out a loan from a bank or financial institution. In fact, between midline and endline, the percentage of farmers who agreed that they felt comfortable borrowing from a bank declined (Figure 12). We found no statistically significant difference by treatment status on this outcome at midline, indicating that the Farmer Financial Literacy training did not impact farmers' confidence in borrowing from local financial institutions. These findings contradict data from qualitative interviews, in which farmers reported that the training helped them to understand how to apply for a loan and how to use borrowed funds. It is possible that among treatment farmers, the training resulted in a slight increase in confidence with formal lending—expressed in the midline soon after training—but that this confidence dissipated by the endline survey in 2020.

We also found that women were consistently less likely to feel comfortable borrowing from a financial institution than were men.

Figure 12: Comfortable Loan Access by Treatment Status



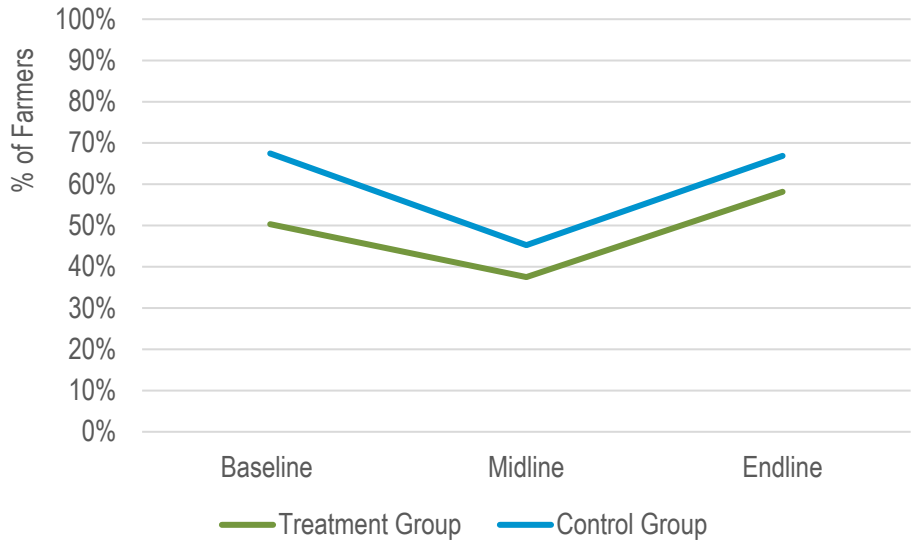
Correspondingly, we found that very few study participants—out of a total 322 individuals—took out loans from a formal financial institution during the study period. Table 3 illustrates data on loan applications to BESSFA Bank, and other formal financial institutions, at each study period. In all time periods, men represented the majority of bank borrowers.

Table 3: Loan Applications by Treatment Status

	Baseline: Applied for a loan in 2017		Midline: Applied for a loan between baseline and midline		Endline: Applied for a loan in 2019	
	BESSFA	Other Financial Institution	BESSFA	Other Financial Institution	BESSFA	Other Financial Institution
Treatment Group	8	7	2	3	4	4
Control Group	9	0	1	0	6	4

In general, participants in this study appear to more commonly borrow from non-bank sources: friends, family members, or savings and loan groups. At midline, 38% of respondents in the treatment group and 45% in the control group reported that they had borrowed money from a non-bank source since the initial training in February 2018. This difference was not statistically significant, and we found no difference by youth status—though we did find that women were 12 percentage points more likely to have obtained a non-bank loans than were men. In both groups, funds were primarily used to cover household expenses. Borrowing from non-bank sources increased between midline and endline. Overall, it does not appear that the intervention encouraged farmers to obtain credit from formal financial institutions more frequently.

Figure 13: Borrowing from Non-Bank Sources

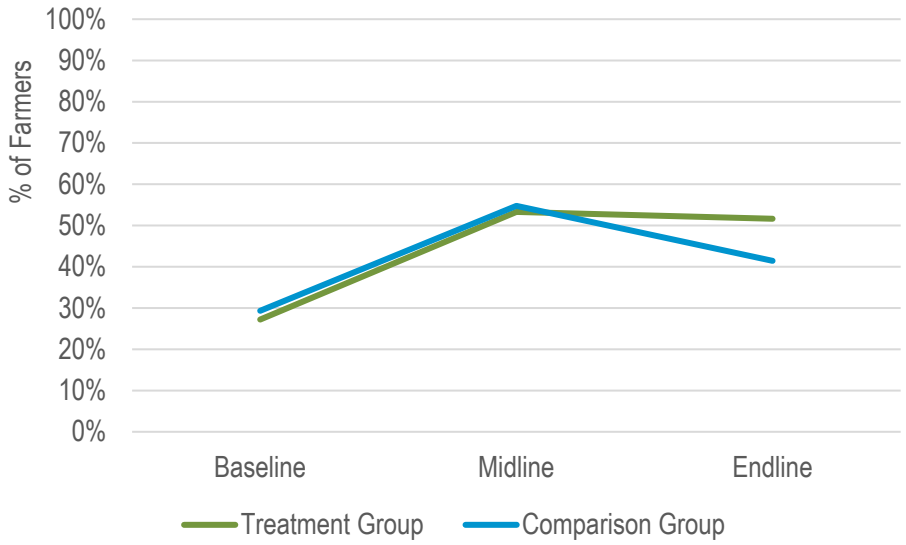


FINDING 4: We did not identify statistically significant impacts of the training on personal financial behaviors or financial satisfaction.

Personal Financial Behaviors

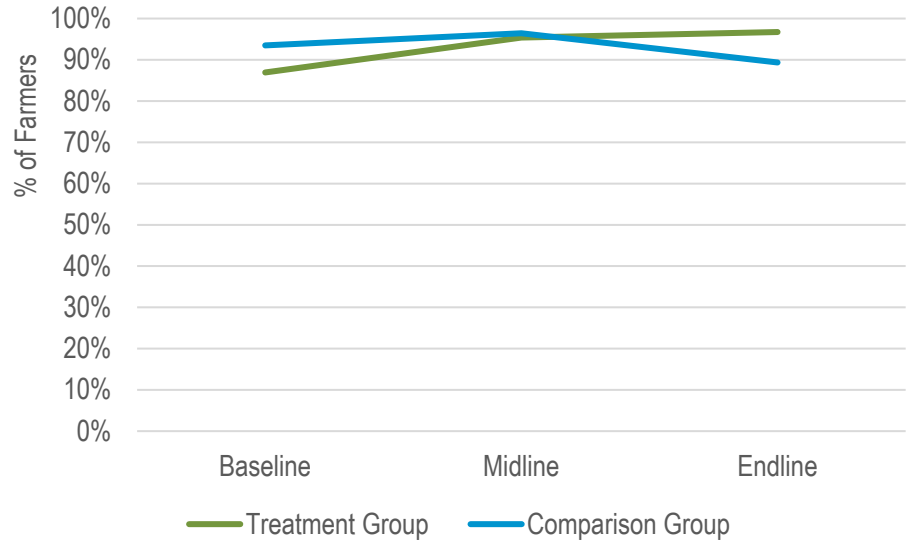
During each round of surveying, we asked farmers if their household maintained a budget. While the use of a household budget increased markedly among all respondents from baseline to midline, we found no statistically significant difference on this outcome by treatment status at midline. As such, the increase in budget use is not attributable to the Farmer Financial Literacy training. Curiously, budget use decreased among both treatment and control farmers between midline and endline—the period during which control farmers should have received the training. We found no difference on this metric by gender or youth status.

Figure 14: Budget Use by Treatment Status



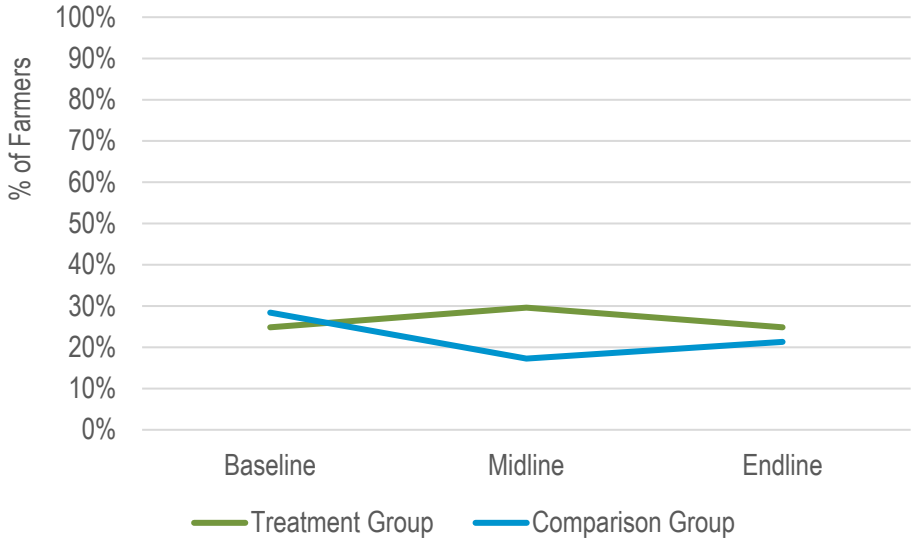
We asked respondents whether their households were actively saving money over the study period. Active saving increased between baseline and midline for both groups, and we found no statistically significant difference in active savings between the treatment and control groups at midline. Again, between midline and endline, there was a slight decrease in likelihood to save among members of the control group—during the period in which they were meant to receive the training. As a result, it appears unlikely that the treatment had a significant impact on saving behavior. We found no difference on this metric by gender or youth status.

Figure 15: Active Savings by Treatment Status



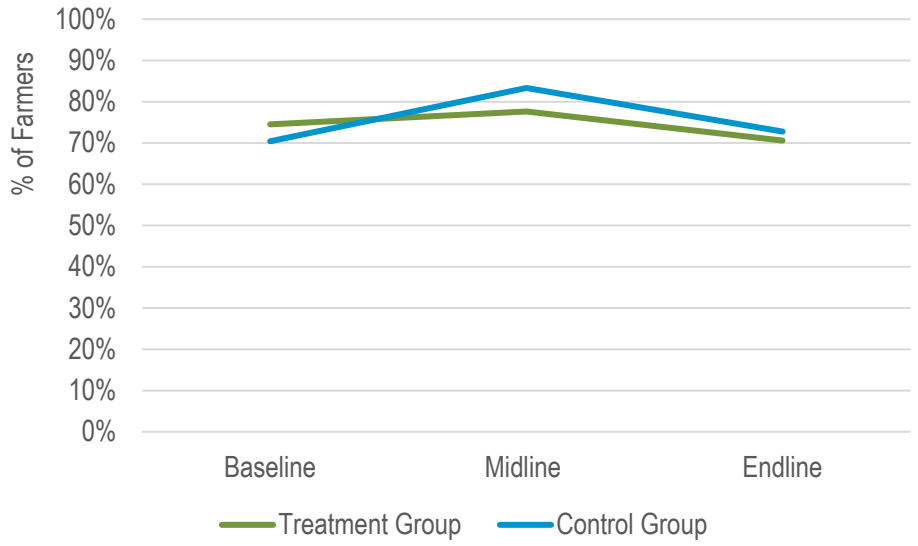
We also asked respondents how they save their money. At midline, we found no difference on the likelihood that farmers were saving money at home, through a savings group, or through other sources. However, we found that farmers in the treatment group were 13 percentage points more likely than control farmers at midline to report saving through a bank account (statistically different from zero at 95% confidence). This gap between treatment and control participants declined between midline and endline (Figure 16).

Figure 16: Saving Via Bank Account by Treatment Status



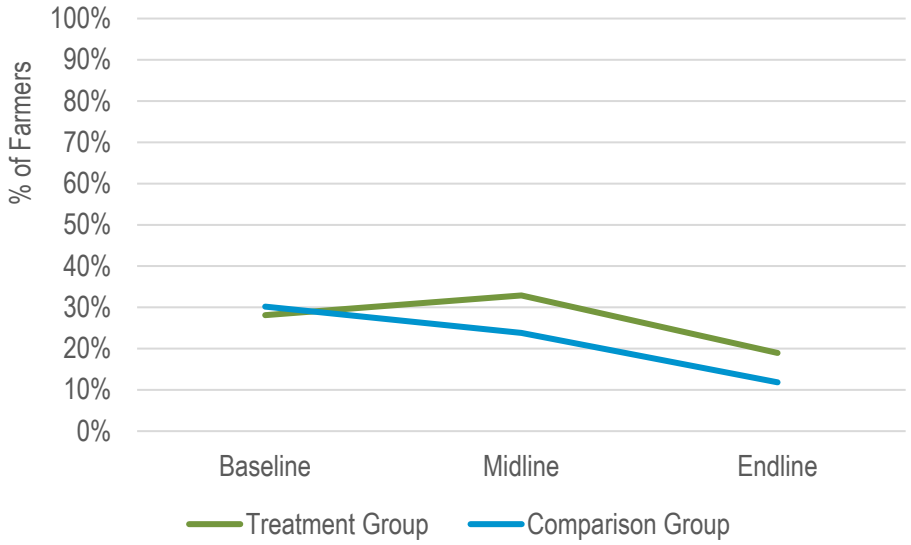
We found no statistically significant difference by treatment status at midline on self-reported ability to pay expenses on time (Figure 17). In both groups, respondents reported that their ability to pay expenses on time improved between baseline and midline, but declined slightly between midline and endline. In all time periods, men were more likely to report paying expenses on time than were women.

Figure 17: Paying Expenses on Time by Treatment Status



At midline, treatment farmers were more likely than control farmers to report being able to face a major expense. As per Figure 18, this measure rose for treatment farmers between baseline and midline, with treatment farmers 10 percentage points more likely than comparison farmers to report being able to face a major expense (statistically different from zero at 90% confidence). This difference appears to be driven primarily by a decline in control farmers' ability to pay for expenses. In both groups, the ability to face major expenses declined slightly between baseline and endline; it is possible that external financial trends in the Garu community could have exerted a negative impact of participant financial well-being throughout the study period We found no statistically significant difference on this outcome by gender or youth status.

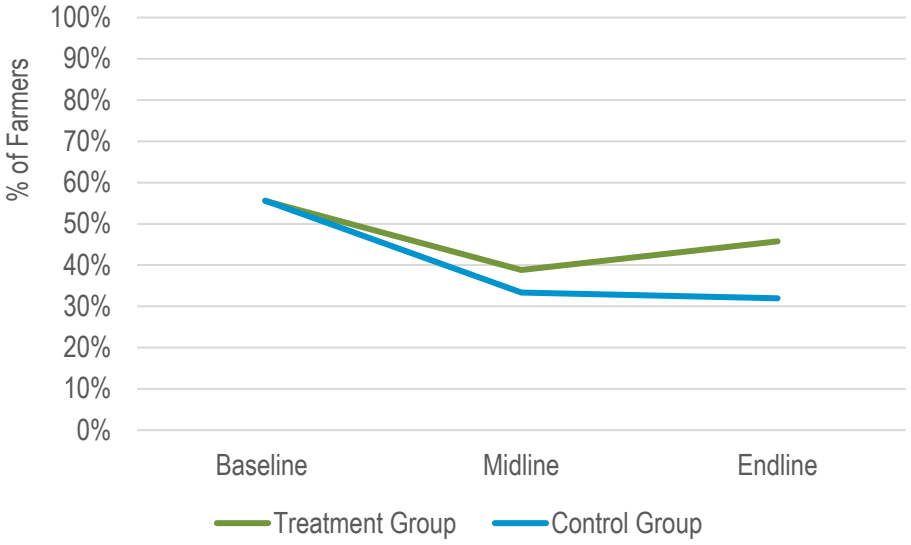
Figure 18: Ability to Face Major Expense by Treatment Status



Financial Satisfaction

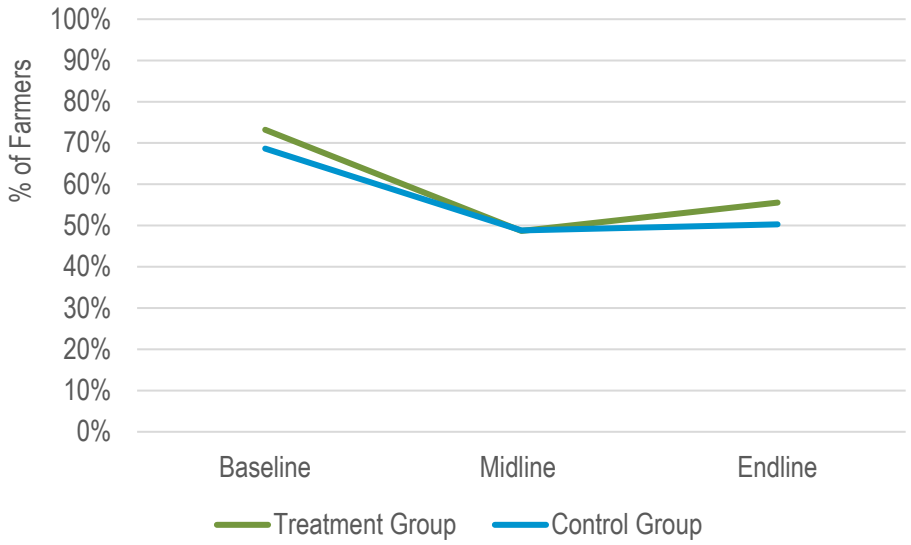
In each study period, we asked farmers if they felt satisfied with their current financial situation. Among all participants, on average, financial satisfaction declined between baseline and midline, and we found no statistically significant difference on this measure by treatment status at midline (Figure 19). Satisfaction recovered slightly for treatment farmers between midline and endline.

Figure 19: Overall Financial Satisfaction by Treatment Status



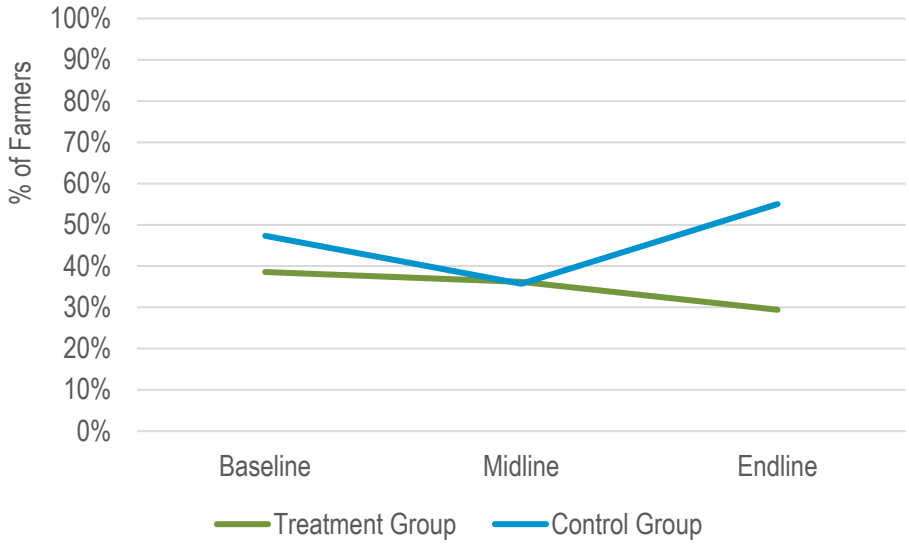
Despite this decline in overall financial satisfaction during the study period, we found that farmers worried less about paying for living expenses between baseline and endline. Fewer farmers in both groups reported worrying about paying for expenses between baseline and midline. This level of worry then increased slightly among treatment farmers between midline and endline. We observed no statistically significant differences on this variable between the two groups and no differences by gender or youth status.

Figure 20: Worry about Paying for Living Expenses by Treatment Status



We also surveyed farmers on whether they felt they had too much debt and found no statistically significant difference at midline. Curiously, control farmers reported a spike in debt concerns between midline and endline. These results indicate that the Farmer Financial Literacy training had little impact on financial satisfaction among participants.

Figure 21: 'I Have Too Much Debt Right Now' by Treatment Status



CONCLUSION

The randomized controlled trial of Root Capital's Farmer Financial Literacy training for farmers associated with Faranaya revealed mixed results on the intervention's efficacy. Farmers reported a high degree of satisfaction with the training's content, but we found only modest gains in financial literacy among training participants relative to nonparticipants at midline. It is possible that farmers were unable to retain learnings between the training and the midline survey one month later. It is also possible that lead farmers did not adequately explain concepts or that something else hindered farmers' comprehension. Attendance issues—with only 70% of treatment farmers reporting that they attended the Farmer Financial Literacy training at midline—may also contribute to the modest impact identified.

We found that training participants were more likely than nonparticipants to hold savings accounts at midline, indicating that the training may have encouraged participants to obtain such accounts. However, we found no relationship between the training and likelihood of receiving insurance or credit. We also found no significant increase in credit access or comfort obtaining loans among training participants, and we found no change in nonbank borrowing among participants vs. nonparticipants. We also found no robust impact of the training on overall financial satisfaction.

While we found few differences in outcomes for younger participants compared to older ones, differences by gender were stark. Though we found no difference by gender in knowledge gains acquired via the Farmer Financial Literacy training, men appeared more likely than women to engage with formal financial institutions across the study period. Men were more likely to hold current accounts and reported greater comfort in accessing loans than did women. Women were more likely to participate in informal financial arrangements like savings groups, borrowing from nonbank sources, and saving money in their homes.

KEY TAKEAWAYS FOR ROOT CAPITAL

These findings highlight several opportunities for Root Capital to improve our approach in future direct-to-farmer training. Under our training-of-the-trainers model, the success of our intervention relies on robust training and mobilization of lead farmers. In this intervention, many lead farmers did not attend their full three-day training due to inadequate communication, transportation costs, and a lack of compensation. By providing financial incentives and transportation options to lead farmers, we can increase their participation in initial trainings. Our intervention model also did not include any knowledge assessment for lead farmers after they received training, limiting our understanding of their understanding of the material and capacity to train others. In future interventions that rely on a training-of-the-trainers model, Root Capital could test trainers directly prior to their group trainings to ensure that lead farmers have the requisite comprehension of financial literacy to teach their peers.

Furthermore, Root Capital staff did not directly monitor the training that lead farmers provided to other farmers. As a result, we could not directly verify if trainings occurred for the planned duration and with all planned farmer participants. We were also not able to observe training quality. If Root Capital staff were to attend farmer trainings, it could help improve training quality or understand better the limitations of the training-of-the-trainers model. With presence at the training, Root Capital staff could also answer questions, correct inaccuracies, or document training issues that could affect participant learning. Future training could also be improved by distributing hard-copy materials to lead farmers and participants summarizing the content of each session. These materials could help to improve knowledge retention and standardize what information is taught.

As noted above, we found persistent gender gaps in financial behaviors across the study period, indicating that the training did not exert an equalizing force on the financial literacy and capacity of men and women. In the future, our trainings could be tailored to better understand the particular challenges faced by women in understanding financial concepts or using financial services. We could then tailor modules to better target those challenges.

Meanwhile, to ensure training continuity and sustainability, Root Capital could involve local financial institutions, like BESSFA Rural Bank, more directly in future training. By collaborating with these institutions, Root Capital could provide financial entry programs for successful participants or equip local financial entities to provide similar training in the future. Doing so would help ensure that interventions will lead to tangible and lasting financial outcomes for participants as they interact with local banks.

These adjustments would likely improve the efficacy of the Farmer Financial Literacy training program, which was highly regarded by Faranaya participants, but achieved only modest impacts on participant financial knowledge and behaviors. Such improvements could help ensure that a training in high demand by clients and farmer-suppliers can better deliver on its goal to strengthen the financial and credit capacity of smallholder producers.

APPENDIX

Section 1: Randomization Success and Differential Attrition

Tables 4 and 5 detail the presence of statistically significant differences on key farm characteristics, demographics, and financial behaviors between the 401 treatment and control participants surveyed at baseline. On the overwhelming majority of characteristics, we found no statistically significant differences between the treatment and control groups, indicating that our randomization process was largely successful. We did find a statistically significant difference on the likelihood of participating in a savings group, with treatment participants 14 percentage points less likely than control participants to belong to a savings group. This difference persisted in the 322-person sample available in all three survey periods, and we controlled for this variable in all regression specifications.

Table 4: Randomization Success at Baseline on Demographic and Farm Characteristics

Baseline Variable	Treatment Group		Control Group		T-Statistic
	Observations	Mean	Observations	Mean	
Male	196	1.229592	205	1.297561	-1.5436
Age	196	49.73469	205	47.34146	1.6135
Married	196	0.9387755	205	0.9365854	0.0904
Years in Sorghum	196	6.602041	205	6.307317	0.7429
Years Supplying Faranaya	196	3.734694	205	3.741463	-0.0237
Sorghum Farm Size	196	2.709184	205	2.582927	0.7752
Sorghum Income	184	714.0978	194	709.134	0.0662
Total Household Income	190	2649.084	202	2390.238	0.8208

Table 5: Randomization Success at Baseline on Financial Behaviors and Knowledge

Baseline Variable	Treatment Group		Control Group		T-Statistic
	Observations	Mean	Observations	Mean	
Household Budget	196	0.255102	205	0.2585366	-0.0785
Checking Account	196	0.0816327	205	0.0682927	0.5065
Savings Account	196	0.3214286	205	0.3170732	0.0933
Savings Group	196	0.5714286	205	0.7121951	**-2.9665**
Loan	196	0.2142857	205	0.2146341	-0.0085
Insurance	196	0.0816327	205	0.097561	-0.5566
Financial Literacy Knowledge Score	196	8.459184	205	8.609756	-0.3843

Tables 6 and 7 detail the presence of differential attrition between the baseline sample of 401 individuals and the 322 people present at baseline, midline, and endline. We identified no statistically significant differences by treatment status on the majority of baseline farm characteristics, demographics, and financial behaviors. We found that individuals who departed the study were, on average, newer members of Faranaya, with 3.18 years of supplying to Faranaya at baseline, compared to 3.87 years at endline. We controlled for this variable in our regression specifications to assess whether length of Faranaya membership is significantly associated with our outcomes of interest.

Table 6: Differential Attrition from Baseline to Endline on Demographic and Farm Characteristics

Baseline Variable	Study Participants		Attrited Individuals from Baseline		T-Statistic
	Observations	Mean	Observations	Mean	
Male	322	0.7391	79	0.7215	-0.9887
Age	322	48.96894	79	46.64557	-1.2447
Married	322	0.931677	79	0.9620253	0.9985
Years in Sorghum	322	6.571429	79	5.962025	-1.2237
Years Supplying Faranaya	322	3.872671	79	3.189873	**-1.9114**
Sorghum Farm Size	322	2.67795	79	2.508861	-0.8262
Sorghum Income	307	699.6808	71	762.8732	0.6586
Total Household Income	318	2394.277	74	3037.486	1.6009

Table 7: Differential Attrition from Baseline to Endline on Financial Behaviors and Knowledge

Baseline Variable	Study Participants		Attrited Individuals from Baseline		T-Statistic
	Observations	Mean	Observations	Mean	
Household Budget	322	0.2515528	79	0.278481	0.4898
Checking Account	322	0.068323	79	0.1012658	0.996
Savings Account	322	0.3198758	79	0.3164557	-0.0583
Savings Group	322	0.6521739	79	0.6075949	-0.7399
Loan	322	0.2173913	79	0.2025316	-0.2877
Insurance	322	0.0838509	79	0.1139241	0.8365
Financial Literacy Knowledge Score	322	8.568323	79	8.405063	-0.3315

Section 2: Regression Results

Table 8: Regression Results on Financial Literacy and Financial Service Use at Midline

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Quiz Score	No Current Account	No Saving Account	No Saving Group	Not Insured	No Loan	Loan Access	Loan Comfort	No Nonbank Loan
Treatment Group	4.54***	-0.0469	-0.120**	-0.0147	0.0336	-0.2***	0.0310	0.0778	0.00453
	(0.737)	(0.0300)	(0.0550)	(0.06)	(0.0409)	(0.052)	(0.063)	(0.0686)	(0.0618)
Baseline Quiz Score	0.0694								
	(0.140)								
Baseline Not Actively Saving	-1.273	0.0550	0.156	0.179	-0.128**	0.0602	-0.23**	-0.188	0.153**
	(1.775)	(0.0359)	(0.0959)	(0.129)	(0.0582)	(0.062)	(0.092)	(0.121)	(0.0568)
Baseline No Saving Group	-0.401	0.0178	0.105*	-0.4***	0.0415	-0.0480	0.0750	-0.00857	-0.243***
	(1.014)	(0.0343)	(0.0587)	(0.083)	(0.0358)	(0.048)	(0.070)	(0.0712)	(0.0534)
Baseline Years of Faranaya Membership	0.0660	-0.00311	-0.00239	-0.0110	0.00095	-0.0024	0.021*	0.0195*	-0.00639
	(0.124)	(0.0036)	(0.0082)	(0.008)	(0.0056)	(0.007)	(0.011)	(0.0103)	(0.0104)
Female	-0.740	0.0338	0.0556	-0.2***	-0.0139	0.0137	0.100	-0.165*	-0.118**
	(0.928)	(0.0148)	(0.0590)	(0.045)	(0.0381)	(0.04)	(0.061)	(0.0646)	(0.0660)
Youth	0.0012	-0.0611	0.0281	-0.0641	-0.102*	0.011	0.156**	0.0775	0.0258
	(1.070)	(0.0403)	(0.0700)	(0.06)	(0.0575)	(0.04)	(0.067)	(0.0760)	(0.0715)
Baseline No Current Account		0.193***							
		(0.0619)							
Baseline No Savings Account			0.360***						
			(0.0557)						
Baseline Not Insured					0.0288				
					(0.0356)				
Baseline No Loan						-0.02			
						(0.03)			
Baseline Loan Access							0.103*		
							(0.056)		
Baseline Loan Comfort								0.158***	
								(0.0555)	
Baseline No Nonbank Loan									0.108*

									(0.0572)
Control Mean	0.4935	0.0299	0.3214	0.75	0.1071	0.0238	0.6429	0.4345	0.4524
Observations	322	313	316	320	320	320	320	320	320
R-squared	0.095	0.136	0.226	0.261	0.043	0.076	0.091	0.086	0.158
Robust standard errors in parentheses									
*** p<0.01, ** p<0.05, * p<0.1									

Table 9: Regression Results on Personal Financial Behaviors at Midline

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	No Budget	Not Saving	Home Savings	Bank Savings	Save w/ Savings Group	Other Saving
Treatment Group	-0.000799	0.00318	0.00920	0.134***	-0.0386	-0.00822
	(0.0579)	(0.0226)	(0.0523)	(0.0438)	(0.0431)	(0.0395)
Baseline No Budget	0.0328					
	(0.0664)					
Baseline Not Actively Saving	0.200	0.0914	-0.0452	-0.104	-0.192*	0.0956
	(0.121)	(0.0657)	(0.104)	(0.0724)	(0.0998)	(0.0990)
Baseline Save w/ Savings Group	-0.0304	0.000178	-0.0833	-0.0466	0.349***	-0.163***
	(0.0746)	(0.0256)	(0.0665)	(0.0551)	(0.0597)	(0.0522)
Baseline Years of Faranaya Membership	-0.000571	-0.00115	-0.0106	0.00152	0.00514	0.0108
	(0.00774)	(0.00303)	(0.00763)	(0.00845)	(0.00734)	(0.00747)
Male	0.110*	-0.0295	-0.108*	-0.00375	0.208***	-0.116***
	(0.0588)	(0.0214)	(0.0584)	(0.0508)	(0.0378)	(0.0331)
Youth	-0.110	0.0178	0.00291	-0.0405	0.0422	0.0583
	(0.0709)	(0.0345)	(0.0751)	(0.0553)	(0.0604)	(0.0595)
Baseline Home Savings			0.0657			
			(0.0588)			
Baseline Bank Savings				0.348***		
				(0.0608)		
Baseline Other Saving						-0.0856
						(0.0522)
Control Mean	1.280***	0.0357	0.2857	0.1726	0.7917	0.1369
	(0.116)					
Observations		320	320	320	320	320
R-squared	285	0.028	0.031	0.181	0.300	0.115
Robust standard errors in parentheses						
*** p<0.01, ** p<0.05, * p<0.1						

Table 10: Regression Results on Financial Satisfaction at Midline

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Financial Satisfaction	No Major Expense	Too Much Debt	Payment On Time	Financial Worry
Treatment Group	0.0347	-0.0956*	0.0285	-0.0639	-0.00639
	(0.0503)	(0.0562)	(0.0814)	(0.0412)	(0.0562)
Baseline Financial Satisfaction	0.108**				
	(0.0487)				
Baseline Not Actively Saving	0.191**	-0.0946	-0.117	-0.0969	-0.00585
	(0.0902)	(0.0774)	(0.111)	(0.0838)	(0.129)
Baseline Save w/ Savings Group	-0.0425	-0.0240	0.0752	-0.0191	-0.0143
	(0.0779)	(0.0701)	(0.0669)	(0.0439)	(0.0722)
Baseline Years of Faranaya Membership	0.00608	-0.00235	-0.00809	0.0135	0.00915
	(0.00712)	(0.00762)	(0.0117)	(0.00831)	(0.00959)
Male	-0.00601	0.00220	-0.0810	-0.109	-0.0132
	(0.0658)	(0.0610)	(0.0557)	(0.0649)	(0.0596)
Youth	0.00452	-0.0495	-0.0407	-0.0225	0.116
	(0.0789)	(0.0630)	(0.0663)	(0.0597)	(0.0738)
Baseline Inability to Pay Major Expenses		0.312***			
		(0.0645)			
Baseline Debt			0.0944*		
			(0.0508)		
Baseline Ability to Make Payments On Time				0.0795	
				(0.0636)	
Baseline Financial Worry					0.0748
					(0.0521)
Control Mean	0.275**	1.271***	0.408***	0.889***	0.410***
	(0.120)	(0.156)	(0.126)	(0.103)	(0.104)
Observations					
R-squared	320	320	320	320	320
Robust standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					