SAVINGS GROUPS, RISK COPING, AND FINANCIAL INCLUSION IN RURAL AREAS*

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Abstract

Savings groups provide access to financial services to households who are underserved by formal financial institutions and microfinance lenders. Using a clustered randomized control trial, we study the impact of these groups on poverty, risk coping, and sustained access to credit from other lenders in rural Peru. Two years after the introduction of saving groups, treated households exhibit reduced vulnerability to idiosyncratic shocks and greater investments in housing quality, especially in poorer villages. The treatment also leads to increased specialization in agricultural activities in poorer villages, which may be explained by reduced exposure to risks. Our study also provides novel evidence on savings groups' longer-term effects on access to loans from other lenders. Relative to the control, the treated group shows reduced access to formal loans and increased reliance on microfinance loans, which goes against the graduation hypothesis. The negative effect on access to formal loans is driven by villages with higher poverty levels and lower pre-treatment access to formal credit.

KEYWORDS: Saving Groups, Village Savings and Loans Associations, Poverty, Vulnerability, Financial Inclusion, Financial Services, Cluster Randomized Controlled Trial.

JEL CODES: : C93, G20, O12, O13, O16, Q12.

1 Introduction

Most of the rural poor around the world remain excluded from the financial system, which limits their capacity to access savings, credit, and insurance services to invest in their productive activities or to manage idiosyncratic risk and seasonality [Collins et al., 2009]. Formal financial institutions are often absent in the most remote areas due to high screening and transaction costs. Even when present, they may charge high fees and offer products and services that do not satisfy the flexibility required by the rural poor, with seasonal demands for credit that reflect their agricultural orientation [Bauchet et al., 2011; Lopez and Winkler, 2018].

The rural poor thus often satisfy their needs for financial services by relying on informal mechanisms.[1] Demand for informal financial services is not only driven by exclusion from financial markets but can also reflect preferences for some attributes such as convenience, ease of use, and trustworthiness [Lee et al., 2012]. A popular mechanism to deliver informal financial services in the developing world are Village Saving and Loan Associations (VSLAs), also known as savings groups or self-help groups.[2] VSLAs are a savings-led, self-managed microfinance group, very similar to Rotating Savings and Credit Associations (ROSCAs) [Besley et al., 1993]. They consist of 10 to 30 community members who agree to save and lend out this common pool to members who request funding. Interest paid on the loans is proportionally shared among the members according to the amount saved during the cycle of the group. Besides directly promoting financial inclusion, the model provides previously excluded members with the skills to navigate the financial system and fosters good financial habits.

This study evaluates the effectiveness of VSLAs in improving households' well-being, and tests if the model contribute to borrowers' progression up the lending ladder and graduation into access to credit from formal financial institutions. Relying on a clustered randomized control trial, we evaluate the impact of the introduction of savings groups on poverty, risk-coping strategies, and access to credit from other lenders in rural Peru. While previous studies have studied the effect of VSLAs on poverty, wealth, and resilience [Karlan et al., 2017; Ksoll et al., 2016; Beaman et al., 2014; Gash and Odell, 2013] and even on child labor and schooling Burlando and Canidio [2017], the focus on access to credit from other lenders is quite novel. While rural financial markets increasingly embrace and build upon informal services, it remains unclear if graduation into formal services takes place down the road.

The treatment was randomized at the village level and consisted of the promotion of savings groups in 240 villages in an impoverished area in southern Peru between 2014 and 2016. The implementer, a development bank in Peru, introduced the VSLA model by sending officers to gather a community's degree of interest and identify potential members. A savings group was set up when officers identified at least ten people interested in becoming members. Our study relies on rich survey and administrative data, as well as administrative records of the VSLAs'

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[1]Savings mechanisms in rural areas are often combined with income diversification strategies as well as group-based insurance mechanisms to deal with the high risk levels inherent to the lives of the rural poor in developing economies [Dercon, 2002].

[2]VSLAs provide informal financial services in 77 countries and serve over 20 million active participants worldwide. See www.vsla.net, last accessed on September 25, 2020.

operations. Endline survey data and credit bureau records allow us to study a variety of social and financial indicators up to two years after the introduction of the VSLA model.

Administrative records on the operations of the savings groups show that there is demand for the savings and credit services offered: about a quarter of the households in treatment villages join a local savings group. The average member accumulates about US$350 after four years in the group, amount equivalent to the monthly minimum wage in Peru. Members are able to save by complying with their monthly deposits while rarely withdrawing from their savings. In turn, they rely on loans from the group to finance their needs, which is consistent with precautionary savings motives.

Two years after the introduction of savings groups, we fail to find any significant effect on average income or expenditures. However, treated households exhibit a significant change in their risk management and coping strategies consistent with their improved access to savings and credit services. First, the treatment led to average improvements in housing quality, which is directly connected to measures of multidimensional poverty [Conceição, 2019] and better health outcomes. This result is also consistent with a significant drop in health expenditures, particularly in the case of poorer households. Furthermore, the treatment led to a significant reduction of households' exposure to idiosyncratic shocks. This effect is particularly strong in poorer villages, where we find important declines in exposure to hunger, death, and job loss shocks. The treatment also led to an increased specialization in agricultural activities in poorer villages, which may be explained by the reduced exposure to risks experienced by this sub-sample.

Sustained access to financial services through the VSLA model depends on several factors such as the cohesion between group members; the group's ability to deal with rotation rates and work with ultra poor members [Burlando and Canidio, 2017]; the capacity of the group to accumulate capital [Le Polain et al., 2018] and mobilize funds; and the continued support of the sponsoring institution that promotes the group and endows its members with basic skills to self-manage them [Greaney et al., 2016].[3] Thus, an important question is if these informal financial institutions contribute to deeper levels of financial inclusion among its beneficiaries.

Credit bureau records from two years after the intervention was launched show that, on average, the introduction of savings groups *reduces* access to loans from other lenders. This net effect hides a substitution away from traditional formal financial institutions and a switch to microfinance lenders. However, this result varies according to the poverty level: in poorer villages, treated households record a drop in their probability of holding debt from formal lenders, without any changes to their probability of borrowing from microfinance institutions. On the

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[3]For instance, Beaman et al. [2014] shows that the positive effects of a savings group program on savings, housing quality, and food security in Mali only materialized when recruitment activities were organized and directly structured by an NGO, while the implementation of the model with soft support from the NGO did not yield much benefit. Moreover, even if information asymmetries are reduced, the group's rules to allocate credit are not usually guided by expected repayment, but rather reflect risk diversification and subjective criteria. Cassidy and Fafchamps [2018] focus instead on the tendency of the associations to have relatively low heterogeneity in terms of the productive activities of their members, which limits the possibility of intermediation between agricultural and non-agricultural households.

contrary, treated households in richer villages show almost null effects in their access to formal lenders, but an increased likelihood to borrow from (and higher debt balances with) microfinance lenders. Further analysis shows that the reduction in the probability to borrow from formal lenders is mostly driven by households in villages with low pre-treatment access to formal credit who become less likely to have productive loans relative to their counterparts in the control group.

All in all, the results on access to credit from other lenders suggest that access to the VSLA model provides an attractive supply of loans and savings that discourages the use of formal credit, particularly among the poor and those highly excluded from financial markets. While savings groups respond to the need to save by offering a means to do it collectively, they also offer access to small loans, but at relatively high interest rates. Nevertheless, this supply of credit is hassle-free and the cost of the credit is partially returned to the member through dividends paid out on savings.

This study contributes to at least two strands of the literature. First, it contributes to the set of empirical studies that study microfinance models. For several decades, the expansion of microfinance services resulted in a boost to the provision of pro-poor financial services in developing countries around the world. However, the evidence does not yield robust results on the impact of these services on poverty reduction [Banerjee et al., 2015; Crépon et al., 2015]. Moreover, with the exception of a handful of organizations that rely on the village banking model, few microfinance institutions work in remote rural areas where the main productive activities revolve around the agricultural calendar.

More specifically, our paper also contributes to the recent literature on savings groups. VSLAs have many characteristics that make them suitable to successfully reach underserved populations in areas with weak or nonexistent local financial markets. Additionally, since funds are raised internally, the cost of introducing savings groups is much lower than that faced by microfinance lenders. Despite these advantages, their increasing rate of adoption in the rural developing world, and their popularity among donors, there are only a few rigorous experimental studies that are able to address endogeneity and selection issues in program roll-out and treatment take-up to accurately measure the role of savings groups on household well-being. Most of the evidence on the effectiveness of savings groups comes from Africa and the results are mixed [Gash and Odell, 2013]. On one hand, no income or expenditure effects are found for savings groups in Ghana, Malawi, Uganda [Karlan et al., 2017], or Mali [Beaman et al., 2014]. However, Ksoll et al. [2016] report positive effects on household expenditures, meals consumed per day, and number of rooms in the dwelling in northern Malawi, while Karlan et al. [2017] and Beaman et al. [2014] find that savings groups help households manage risk, either through consumption smoothing or food security. Increased human capital investments are present in India [Baland et al., 2020] but not in Mali [Beaman et al., 2014]. The literature has not focused as much on potential spillovers of access to this technology on deeper levels of financial inclusion.

This paper leverages the introduction of the VSLA model in Latin America and poses at least three key contributions relative to previous studies. First, we allow some time for the treatment

to play a role on households' welfare and financial inclusion status. Most previous experimental studies have short follow up periods after the deployment of the intervention, which limits the possibility of finding longer-term effects on poverty and households' well-being. Second, we go beyond survey records and collect high-quality administrative data on the operations of the savings groups to provide insights on the mechanisms that are activated by the treatment. Third, our study relies on unique individual-level credit bureau data that allows us to contribute to the discussion on the role of savings groups in financial inclusion and demand for formal financial services. This novel contribution speaks not only to the literature on microfinance and informal financial services, but to the more general issue of sustainable provision of high quality financial services for the poor. Given the concerns around savings groups' sustainability in the longer term, it is quite important to look at the spillover effects that access to this technology can have on access to financial services from other formal and informal financial institutions.

2 Context and Experimental Design

2.1 The Intervention

Savings groups, also known as self-help groups or VSLAs, are associations created with the common goal of gradually accumulating savings that can be used as capital to meet the financial needs of their members. They establish a mechanism of self-selection and social pressure for the fulfillment of savings commitments and loan repayment [Karlan et al., 2017]. Each savings group is set up as a civic association with ten to thirty members from the same community. The group meets regularly to make savings contributions that are put together into a common fund. This fund is then used to support the economic activities and needs of their members through loans that pay an interest rate and thus provide a return on savings. The operating rules require that all the funds collected should be completely lent out to members of the group at all times. The financial profit generated through lending is proportionally distributed at the end of each year depending on the individual level of savings.

Compared to ROSCAS, the VSLA technology has more flexible rules. First, members can save more than the minimum amount required at each monthly meeting. Second, members are not forced to take the total pot based on a pre-determined order; instead, loans are granted on demand and simultaneously to several members. Savings groups also have a solidarity fund that can be used to help out a member in need of an interest-free loan. The VSLA model also shares a few features with the village banking model including group meetings, the development of a network, and mandatory savings. However, savings groups do not rely on any external funding source and, unlike the village banking model, the loans provided do not seem to be the main focus of the association. VSLAs are self-managed groups that can be thought of as a social savings technology, where commitment to the group facilitates compliance with savings goals.

The Development Finance Corporation (COFIDE), a development bank in Peru, supports financial inclusion in rural areas of the country through the Inclusive Program for Rural Business

Development (PRIDER, by its acronym in Spanish). This program has been promoting the establishment of savings groups since 2005, and has worked in nine different regions of the country so far, forming 1,384 savings groups with up to 18,600 members.[4]

Once PRIDER identifies candidate villages to introduce the savings group model, their officers assess the community's degree of interest and identify potential members. A savings group is set up when officers identify at least ten people interested in becoming members. The group chooses its representatives who are then asked to attend three training sessions about savings, credit, and management of the group's financial transactions. The members of the newly constituted savings group choose a minimum required level of periodic savings. In the group's accounting records, individual deposits represent shares of the group's stock. Members also determine passive and active interest rates; the terms and penalties for delayed payments; and internal rules. They designate a President, Treasurer, and Secretary, appointments that change periodically as a way to share knowledge within the group.

Each savings group is self-managed, although they usually have the technical support of a promoter during the early years that is subsidized by the sponsoring organization [Greaney et al., 2016]. Once the group is operational, members hold monthly meetings to collect deposits; evaluate new loan requests; disburse new loans; and collect fees and interest on outstanding loans. Promoters attend these meetings, helping with the training of new group officials or guiding the application of the rules under the specific circumstances of the members. Attendance is mandatory and absences are penalized. To retain members during a cycle, additional penalties are imposed on those who decide to abandon the group before the end of the working year: the leaving member gets back the value of her share, but does not receive the financial profit accumulated on her savings during the year.

On top of the financial intermediation that is facilitated, PRIDER's program offers additional support activities aimed at contributing to the development of families. For instance, they focus on restoring weak social ties, strengthening participants' self-esteem, facilitating access to agricultural inputs, offering management tools, and promoting participation in productive associations. The program also offers technical guidance and advice for agricultural businesses.

2.2 Experimental design

In 2014, PRIDER decided to expand its operations to Ayacucho, an impoverished department in southern Peru. Their plan to boost the creation of savings groups considered 120 villages in four provinces: Huamanga, Huanta, Cangallo, and Vilcashuaman. Due to staff capacity constraints, the expansion of the program was rolled out in three phases between 2014 and 2016. Villages located in Huamanga and Huanta were served during 2014 and 2015, respectively, while Cangallo and Vilcashuaman were reached in 2016. Figure 1 chronologically organizes the intervention activities (in bold) as well as the data collection activities (in italics).

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[4]See https://www.cofide.com.pe/inclusion_financiera.php, last visited on October 20, 2021. PRIDER started its operations in Lambayeque and Cajamarca but has expanded its coverage in recent years into Ica, Piura, Loreto, Huanuco, Puno, San Martin, and Ayacucho.

PRIDER pre-identified 260 eligible villages in 23 districts, located in the four target provinces. A village was eligible only if it was defined as rural, as per the 2007 Population and Housing Census, and recorded population size above 150. Villages that were extremely remote or with high risk of violence associated with local terrorist groups were excluded. PRIDER's field officers validated villages' suitability for the expansion of the program, which reduced the number of villages to 240.

Randomization was stratified by roll-out round and district. For each round, we first randomized the treatment at the village level a hundred times and measured the differences across control and treatment groups in terms of their pre-program characteristics.[5] We randomly chose one of the randomization trials among those that did not generate significant differences across groups. Table A.1 in the Appendix shows the resulting balancing test of pre-treatment village characteristics. Figure A.1 in the Appendix shows the geographical locations of the villages included in the experiment by treatment arm and roll-out round.

The expansion of the program in treatment villages was deployed in three rounds, between September 2014 and January 2017. The number of savings groups grew exponentially within this period and then remained flat once PRIDER moved on to other areas. By January 2017, 171 savings groups with a total of 2,176 members were working in 120 treatment villages. That is, 1.4 savings groups were created in each treatment village with an average size of 12.7 members.

2.3   Data and Measurement

Before introducing savings groups in the intervention, we collected baseline data in the control and treatment villages. Follow-up surveys were conducted on a rolling basis, two years after the roll-out of each implementation round.

For the baseline survey, we randomly chose an average of 10 households per village. The actual number of surveys conducted in each village was proportional to the population size. The sampling procedure depended on the geographical extension and spatial distribution of dwellings in the village. Since most of the villages did not have an updated map, the surveyor began the process in the town square of each village. She chose a block of houses on the edge of the town square and picked one as a starting point. The first house with willingness to respond becomes the first observation in that village. The team then skipped three houses and moved clockwise until they found a second household willing to be surveyed. Once two houses were effectively surveyed in a block, the surveyor moved to the block on the opposite diagonal. This process continued until the limits of the village were reached. The team then returned to the town square to repeat the same process in the opposite direction. At the household level, the respondent was chosen among the head of the household and their partner so as to reach a given sex and age quota at the village level.[6]

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[5]Using census data, we construct village-level variables such as the presence of a health center or a school of any educational level near the location, total population, percentage of households with adequate drainage service, percentage of households with electric lighting provided through a public network, and literacy rate.

[6]The quota was established ex-ante so as to replicate the global distributions of sex and age in each village.

The baseline survey covers topics such as characteristics of the respondent; characteristics of the household; employment and time use; non-agricultural business activities; agricultural and forestry activities; savings and credit history; business attitudes; social networks; household vulnerability; and financial knowledge. The questionnaire also gathers basic information about other household members such as relationship with respondent, age, gender, and education level.

A total of 2,369 households were surveyed during the three rounds of baseline surveys, with 1,169 in the treatment group and 1,200 in the control group. Table A.2 in the Appendix reports the number of records by survey round. Tables A.3-A.4 in the Appendix provide basic descriptive statistics, as well as balancing tests of the randomization at the household-level. Consistent with the random treatment assignment, we found few significant differences between the groups. The average age of the respondent in the sample is 42. Only 18% of the sample reported having at least completed secondary school, while 82% said that the language most used at home was Quechua. Over 85% of the households reported engaging in agricultural or livestock activities, although only 35% reported selling at least part of their production in the market in exchange for money.[7] On average, households in the sample spent 27 hours per week working on the family farm.

Two years after each baseline survey round was completed, we revisited the 240 villages in the experimental sample and retraced the sample of households originally surveyed. The follow up questionnaire was similar to the baseline instrument and targeted the same respondent who was initially interviewed.[8] The final sample in the follow up survey consisted of 1,827 households (see Table A.2), which represents a 23% attrition rate. However, the household re-contact rate in the treatment group was higher in treatment villages (81%) than in control ones (74%). Column 1 in Table A.6 confirms that attrition at the household level is differential by treatment status, even after controlling for other important criteria which are orthogonal to the treatment assignment. These differences in re-contact rates vanish when we focus on the last two rounds (see column 2 of Table A.6). At the individual level, attrition rates are not differential by treatment status either in the full sample or in the samples limited to rounds 2 and 3. To take into account potential biases due to differential attrition, all estimation results include survey round fixed effects.

A second source of data are credit bureau administrative records with monthly frequency. These data includes monthly individual-level information on outstanding debt at both traditional banking institutions (i.e., banks; municipal and rural credit unions; and financial institutions targeting micro and small businesses) and most of the informal microfinance lenders (i.e., NGOs

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[7]The difference is comprised of self-consumption and bartering.

[8]Surveyors received a list including the full names of people surveyed at baseline, as well as those of their partner, and contact information (address, reference, telephone number of the person to be surveyed, and a person who could help to contact them). Upon reaching each village, surveyors contacted a key informant, either a local authority or someone from the community, to obtain detailed information about the location of the households to be surveyed. The protocol called for up to three attempts to interview the same respondent as the baseline. If such respondent was not reached, they proceeded to interview the partner/spouse. If no respondent was reached, the household was removed from the sample.

and cooperatives).[9] The latter tend to relax the minimum requirements to get a loan at the cost of higher interest rates when compared to banks [Campion et al., 2010].

For each loan, credit bureau records report pending loan balances, the type of loan, and its status. Loans with formal banking institutions come from the public credit bureau run by the Superintendency of Banks (SBS) between August 2012 and April 2020. These records provide outstanding debt levels with banks and other supervised financial institutions. Loans from non-regulated financial institutions such as cooperatives and NGOs were obtained from two private credit bureaus that operate in Peru, EQUIFAX and SENTINEL. We relied on national identification numbers and names collected in the baseline and endline surveys to search both household heads and their partners in the public and private credit bureau records. Data for the household heads comes from SENTINEL and covers the periods August 2014 through August 2019. Partners' data instead comes from EQUIFAX, covering the months between March 2015 and March 2020.

A third source of data are the transactional records of the savings groups' operations between October 2014 and October 2018. These data provide information on savings and loans operations at the individual-monthly level. All variables measured in soles, both from credit bureau and savings groups' transactional records, are converted to August 2014 dollars.

2.4 Outcome Variables

Households' exposure to shocks, expenditures, wealth, dwelling characteristics, and participation in productive agricultural and non-agricultural activities are all measured relying on survey data. Additionally, the survey also offers information to construct variables such as the probability of saving; the level of financial literacy; and the size and nature of the respondent's key information network. In turn, variables measuring access to credit from other lenders are obtained from credit bureau records. Both survey-based and credit bureau-based outcomes are measured after two years of exposure to the intervention.

Vulnerability levels are captured by a set of dichotomous variables that measure a household's experience of negative shocks such as hunger, disease, death, job loss, theft, damage or loss at home, labor shortage, crop loss, or livestock loss during the past 12 months. Additionally, a summary indicator variable captures exposure to any of these idiosyncratic shocks. To measure consumption levels, we construct households' total monthly expenditures. To dig deeper into consumption patterns, we also measure monthly expenditures in three main categories: food, health, and other. Wealth levels are measured using an asset index that is constructed using a question on the possession of assets (i.e., telephone, internet, cell phone, cable TV, radio, blender, bicycle, stereo, computer, television, and sewing machine), which is then standardized to the control group. Housing quality is also measured by an index that captures the quality of the materials used in the walls, floor, and roof. Survey data on households' diversification in

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[9]Notice that we loosely use the label "informal" to group NGOs and cooperatives offering microloans and microsavings intermediation. These entities are not supervised by the national banking regulator as they are not allowed to capture deposits.

terms of their productive activities allows us to measure if the household owns a non-agricultural business, the number of non-agricultural businesses owned, the number of harvested crops if the household sells harvested crops, and the number of livestock.

Combining survey data and VSLAs' administrative records, we measure take-up of local savings groups by the household members, and the probability of having savings in formal or informal mechanisms, including the savings group. Financial literacy levels are expected to change due to the training received from the sponsor institution at set up and engagement in the regular operations of the group. We obtain a financial literacy score from respondents' answers to the Big Three questions, proposed by Lusardi and Olivia [2011], which measure basic knowledge of interest rates, inflation, and investment diversification.

Access to credit from other lenders is measured both in terms of the extensive and the intensive margins after two years of exposure to the intervention. Recall that we use both the household head's and their partner credit history to measure total access to credit at the household level. We measure the probability of having a loan in the previous 12 months. We are also able to look at this probability by type of lender (formal vs informal) and type of loan (consumption vs productive, in the case of formal lenders only).[10] On the other hand, we measure total debt balance, as well as debt balance by type of lender and loan type.

3   Estimation Strategy

The sample we use to evaluate the effectiveness of the program consists of all households with records in the follow-up survey, as they have data on the outcome variables after two years of exposure to the intervention. To measure the effect of the savings groups, we estimate the intention to treat (ITT) from an OLS regression:

$$Y_{ijkl} = \alpha + \beta T_j + \gamma X_{ij} + \delta_k + \phi_l + \varepsilon_{ijkl} \tag{1}$$

where Y_{ijkl} is the outcome variable for household i located in village j, district k, targeted in round l. T_j is a dummy variable that equals one when the household belongs to a village selected to be supported by PRIDER to introduce the savings group methodology. X_{ij} is a matrix that contains individual and village-level characteristics, including the value of the outcome variable at baseline. Implementation of an analysis of covariance (ANCOVA) to estimate the treatment effects leads to large improvements in power compared to a difference-in-difference specification [McKenzie, 2012]. Considering the stratified randomization process, the regression model also includes fixed effects at the district level, δ_k, and the round of intervention, ϕ_l. ε_{ij} denotes the error term, which we assume is independent between communities, but not within a community and thus we implement the Huber-White correction at the village level.

Additionally, we also focus on the potential heterogeneous impacts of the intervention. To do

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[10]Data on the type of loan granted by NGOs and cooperatives is not reported in the credit bureau records.

so, we rely on an extended regression model as follows:

$$Y_{ijkl} = \alpha + \beta_0 T_j + \gamma X_{ij} + \theta z_{ij} + \beta_1 T_j z_{ij} + \delta_k + \phi_l + \varepsilon_{ijkl} \tag{2}$$

where z_{ij} is a dummy variable that equals one if household i or village j matches the characteristic under analysis and is zero otherwise. In this model, β_0 measures the ITT effect for those with $z_{ij} = 0$, while $(\beta_0 + \beta_1)$ will capture the effect among those with $z_{ij} = 1$. Note that characteristic z_{ij} can be included in matrix X_{ij}.

Since the take up levels were not perfect (see Sub-Section 4.1), we also estimate the treatment-on-the-treated effect (TOT). Fortunately, PRIDER's administrative records on the activities of the savings groups allow us to identify the participation status of each individual originally sampled in our baseline survey. To obtain the TOT effects, we instrument actual membership to a savings group with the original random assignment to the treatment (T_j). This estimator is obtained from a two-stage procedure, where the second stage is given by:

$$Y_{ijkl} = \alpha + \omega \widehat{T}_{ij} + \gamma X_{ij} + \delta_k + \phi_l + \varepsilon_{ijkl} \tag{3}$$

The indicator variable $\widehat{T}_{ij}$ equals one if someone in the household ever joined a savings group. The first stage assumes that affiliation to a savings group ($\widehat{T}_{ij}$) is greatly determined by PRIDER's targeting strategy which selected villages at random. Thus, since T_j is exogenous to the preferences and abilities of individuals in treated localities, it is the perfect candidate to instrument $\widehat{T}_{ij}$:

$$\widehat{T}_{ij} = \tau_1 + \tau_2 T_j + \delta_j + \mu_{ij} \tag{4}$$

The coefficient ω in (3) measures the TOT effects of the intervention. Appendix A reports the results for the TOT estimator (see Tables A.7-A.14).

Following Anderson [2008], sharpened False Discovery Rate (FDR) q-values are computed for each family of outcomes to deal with the potential issue of simultaneous inference. The FDR is the expected proportion of rejections that are Type I errors (false rejections).

All main tables present the average treatment impacts as well as ITT results by poverty level of the village. While all target villages in the sample are drawn from an impoverished region of the country,[11] we expect the treatment to have stronger effects in areas that are relatively poorer as poverty is linked to higher exposure to shocks, lower access to financial services, and limited resilience [Dercon, 2002].

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[11]Seventy-four percent of the districts considered in our experimental sample have more than 60% of their population living in poverty.

4 Results

4.1 Take-up

According to baseline data, almost 70% of the experimental sample regrets spending money instead of saving it, while 54% of those surveyed want to save more than their spouse (see Table A.5). This reveals the importance that targeted households attribute to savings, but it also reflects that they may face behavioral biases or intra-household constraints that limit their ability to reach their savings goals. Moreover, access to credit is quite limited in our sample: only 6% of the households interviewed at baseline report having a loan with a formal financial institution in the previous 12 months and about 25% had a loan with an informal financial institution, a moneylender, or family/friends. We thus expect the VSLAs to satisfy an unmet demand for financial services in the area.

Our ability to appropriately measure the effect of savings groups depends on the take-up rate in treated villages. A low take-up rate imposes limitations to the statistical power of the study [Bruhn and McKenzie, 2009]. We measure participation in PRIDER-sponsored VSLAs both at the household and individual levels, relying on the baseline survey and administrative records on the groups' operations. Figure 2 shows that take-up rates in the baseline survey sample experience a steep boost during the first months after the introduction of the program and a posterior flattening of the growth pattern. Average take-up rates in the treatment group reach 14.3% among those interviewed at baseline, but they significantly rise to 23.5% when we consider participation of any member of the household.[12]

Table 1 tries to assess if observable characteristics are good predictors of take-up rates at the household level. Focusing on the sample of households in treated villages, we estimate the probability of joining a savings group as a function of household head characteristics (age, marital status, education, level of entrepreneurship, trust in others, and level of financial knowledge) as well other household-level variables (language spoken at home, number of children, ratio of household members to bedrooms, and wealth index) as measured at baseline. We also evaluate the association between the household's previous interactions with financial institutions such as previous participation in village banks and access to formal credit.

Column 1 shows that having a female household head is the only relevant characteristic for predicting adoption of the savings group methodology. Take-up rates are 12 percentage points higher when the household head is a woman, which represents a 50% increase relative to average household take-up rates. Other characteristics of the household head or the household do not have a significant influence on participation in savings groups. Column 2 adds the asset index as well as pre-treatment financial access variables. The results remain mostly unaltered, except for a small increase in the coefficient (and significance) of marital status of the head relative to column 1. Moreover, previous participation in village banks has a positive and significant effect

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[12]Related studies of savings groups in Africa reported take-up rates between 32-37% [Beaman et al., 2014; Karlan et al., 2017]. Ksoll et al. [2016] report a 45% take-up rate in treatment areas of Northern Malawi, but control areas reached a 21% take-up rate.

of 8.6 percentage points on the probability of joining a savings group.

This last result reveals that previous experience or geographical exposure to similar informal mechanisms encourages households in treated areas to join a VSLA. It may also suggest that the VSLA model offers additional and valued services relative to village banks. Households may be substituting away from the village banking model to overcome the limited flexibility that it offers (e.g., requirement to take a loan in every period or repayment cycles that are not aligned with the agricultural calendar). Indeed, VSLAs' retention rates over the first three years are quite high. By the end of the first year, 84% of the original members are still members of the group and the retention rate persisted at 64% by the end of the second year (see Table 2). These retention rates are much higher than those reported by village banks in Ayacucho. For instance, Karlan and Valdivia [2011] find that two years after joining a village bank only one out five clients was still an active member. Table 2 also shows that average rotation rates under PRIDER's VSLA model (measured as the ratio of new members to dropouts) were well above 1 in the first two years of operation. In other words, savings groups were able to more than compensate for the loss of members, which is a big challenge for NGOs sponsoring village banks.

4.2   Capital Accumulation and Mobilization in the Savings Groups

On average, each savings group started out with a financial capital of US$98.7, which increased by 5,135% after four years of operation (see panel (a) in Figure 3). At the individual level, the average member accumulates about US$350 after four years, which is about one monthly minimum wage in Peru. This is a significant amount considering that the study sample includes several ultra-poor farmers focused on subsistence agriculture (see table A.3). Savings groups have to lend all the money they collect through stocks (i.e., mandatory savings deposits) and voluntary savings. As total savings held by the group increase over time, so does the number of borrowers and the average loan size. Panels (b) and (c) in Figure 3 show this pattern: by the end of the second year of operations, 75% of the group members have an outstanding loan. The increase in the average size of the loans can be explained by diverse motives: increasing financing needs, increasing pressure for members to take-up loans as the group's stock of savings grows, or a preference for loans over savings to serve household financial needs.

Figure 4 shows the trends of individual purchases and sales of stocks (i.e., savings deposits and withdrawals) as well as those of loan disbursements and repayment. The dotted line in panel (a) shows that, in most periods, average monthly stock purchases amount to US$10. This pattern holds over the three-year period following the creation of the group, with a few peaks in savings deposits at the end of each year of operation (i.e., at 12, 24, and 36 months since the creation of the VSLA). This timing coincides with the end of the cycle and the period in which savings groups distribute the dividends that result from the interest charged for the loans. The average member reinvests a significant portion of her dividends, increasing their balance of savings. In turn, the average member almost never sells their stock: as the solid line in panel (a) shows, withdrawals stay flat throughout the 36 months following the creation of the group. Savings

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withdrawals seem to be exclusively linked to drop out.

In turn, panel (b) shows that members prefer to cover their financing needs through loans, keeping precautionary savings. Average debt disbursement increases in a sustained manner. Repayment rates stay high throughout the three years following the creation of the group, as average repayment flows closely match average debt disbursement. This is an interesting result as the interest rates charged for the loans tend to be high (3-5% a month). However, members may not perceive this as a cost since the interest gains made by the group are then distributed proportionally to individual savings.

4.3 Treatment Impacts on Well-Being and Risk Coping

The previous subsection shows that savings and loan transaction patterns within the groups are consistent with the members assigning a high value to their savings and the specific technology to save offered by the group. Thus, we first show the impact of providing access to VSLAs on the probability of having savings at endline. Column (2) in Table 3 presents the average treatment effects, while columns (4) and (6) present the results by the village's degree of poverty. In general, the probability of saving increases by 7 percentage points, irrespective of the poverty level. This increase in the ability to save is exclusively driven by an increased probability of saving via the savings group; no significant effects are detected in the probability of saving through formal or other informal mechanisms.

One of the central goals of financial inclusion efforts among impoverished households is the possibility to reduce their exposure to negative shocks. While VSLA may not insure households against aggregate shocks such as heavy rains or droughts, they can be very effective in helping the poor deal with unexpected negative shocks to the household related to health or employment, among others. Column (1) in Table 4 indeed reveals that 86% of the households in the control group experienced a negative shock in the past 12 months, with crop losses being the most common (65%), followed by health shocks (42%), job losses (42%), and labor shortages (39%).

To measure the effect of access to the savings group model on households' risk management levels, Table 4 presents the treatment impacts on the probability of experiencing an idiosyncratic shock in the previous 12 months. Column (2) presents the average effects, while columns (4) and (6) present the results by the village's degree of poverty.

On average, households' exposure to negative shocks is reduced by 5 percentage points, and most of this effect is driven by a reduced risk of facing the loss of a family member. When focusing on relatively poorer villages (see column (6)), we notice that the reduction in the probability of facing a shock amounts to 9.4 percentage points, and this effect is significantly different from that experienced by households in richer villages (see column (7)). Among poorer households, the treatment is particularly effective in reducing the likelihood of idiosyncratic events such as hunger, death, and job loss, but yields no effect on crop and livestock losses that are usually connected to aggregate climate shocks. Our results are in line with Beaman et al. [2014], who show that savings groups led to significant improvements in food safety and consumption

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smoothing in Mali.

But how is this reduced exposure to risks achieved? What are the margins of impact that access to financial services trigger through access to the VSLAs? Table 5 presents the estimated ITT effects on consumption spending, asset ownership, and housing quality. Column (2) reveals that there are no average impacts on monthly expenditures or on household assets. This lack of impact on monetary poverty is in line with previous findings on the effect of savings groups in African countries such as Mali, Ghana, Malawi, and Uganda [Beaman et al., 2014; Karlan et al., 2017]. Nevertheless, we find that treated households are able to significantly improve their living conditions in terms of their dwelling. Relative to the control group, treated households improve the quality of their houses by 0.12 S.D, which is mostly explained by increases in the likelihood of having good quality floors (4 percentage points) and roofs (2 percentage points).

The effect on housing quality supports the idea that savings groups facilitate the accumulation of lump sums of money required to make investments in indivisible projects such as those related to housing upgrades [Kaboski and Townsend, 2011], which in turn are likely to have health effects [Haines et al., 2013]. This result is also in line with an average reduction in out-of-pocket health expenditures (see third row in Table 5) and a reduced risk of death in the household (see Table 4). Indeed, health expenditures are particularly reduced among poorer households; since they are likely to start off with worse dwelling conditions, the relative improvements in housing quality can really make a difference in preventing health issues. This is also aligned with the evidence presented above on reduced vulnerability for poorer households, who experience important drops in their probability of facing hunger, death, and job losses. In turn, relatively richer households increase their health expenditures, signaling that reduced death vulnerability for them may be the result of investments in preventive health care.

In sum, although we find no significant treatment effects on monetary poverty, we find two effects that are clearly related to improved living conditions among the poor. First, savings groups reduce households' levels of vulnerability, which is key to reducing the likelihood of permanent effects of temporary shocks. Second, the treatment leads to housing improvements, which seem to be linked to health improvements.

Access to savings and credit through the savings groups can also have important direct and indirect effects on productive activities undertaken by the household. First, the provision of cheap and adequate financial services may foster the household's investment in productive agricultural and non-agricultural activities. Additionally, the technical guidance provided by the program for agricultural businesses may lead households to specialize and shy away from other market activities, especially if the latter were performed by necessity, to complement family income. Second, the social capital and networks developed within the group and across savings groups in the village may foster greater job stability and increased job opportunities, both in the agricultural and non-agricultural sectors. Interactions with the group may also have the added advantage of access to information about market opportunities, prices, and technology, among others. Finally, as households become less exposed to idiosyncratic shocks, their incentives to diversify production and allocate family time to non-agricultural businesses are also depressed.

This may be a particularly strong effect among poorer households who faced reduced risk of job loss as a result of the treatment.

Table 6 presents the treatment impacts on the choice to participate in diverse productive activities. On average, access to savings groups only yields a significant reduction in the number of harvested crops. However, the results among poorer households exhibit a much more marked pattern of specialization: the treatment reduces the probability of owning a non-agricultural business (with a corresponding drop in the number of businesses) while reducing the number of livestock and crops held by the family unit. We also observe an increase in the investment in crops that are destined for cash markets, although this effect is not statistically significant. These results are in contrast to the increased investment in non-farm activities found by Karlan et al. [2017] and are probably explained by contextual differences and the agricultural focus of the implementing agency in Peru.

The reduction in the level of diversification among poorer households is consistent with an improvement in available financial services, and suggests that the intervention is providing them with the means to focus on activities for which they have a comparative advantage and/or a preference. It is also aligned with the lower levels of vulnerability identified among poorer households. However, we do not find that the treatment expands households' information networks. Table 7 shows that access to the VSLA technology has no effect on the number of people the household relies on to get information or to consult on important decisions.

4.4 Treatment Impacts on Access to Credit from other Lenders

While the previous subsection showed that access to VSLAs leads to promising impacts on households' vulnerability, well-being, and diversification strategies after two years of exposure, a key question remains about the sustainability of these effects further down the line. On one hand, the emergence of savings groups was not spontaneous, despite the fact that they did not require external funding to be created. Once the sponsor institution moves to other areas, the groups face a reduced chance of survival. On the other hand, even if the group survives without further support or guidance, other threats related to the capacity of the group emerge, including keeping rotation rates stable, maintaining group heterogeneity, and mobilizing funds.

Access to the VSLA methodology may be an important stepping stone in terms of deeper financial inclusion levels, particularly for households previously excluded from the financial system. Self-management of the savings groups allows individuals to absorb important financial concepts by participating in real-life financial decisions related to their own resources, which can help them overcome financial literacy and trust issues that restrict their demand for credit from external financial institutions.[13] If VSLAs expand access to credit beyond that obtained directly from the group, the methodology can be regarded as one fostering borrowers' progression up

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[13]The creation of the savings groups implies a training component for the leaders on regular and sustainable management of the group's finances, including decisions on the amount of mandatory monthly savings, the interest rate paid for loans, and selecting group members who will take out loans, among others. But even members who are not trained participate in the meetings and take part of these choices.

the lending ladder. In particular, savings groups may promote graduation into access to credit from formal financial institutions.

Table 3 shows that participation in the savings groups does not affect financial literacy levels among its members. Moreover, as repayment information from the VSLA is not formally shared with credit bureaus or other lenders, it is hard to expect that the borrower can use their good reputation in the group to secure external funding.

Table 8 reports the treatment effects on both the extensive and intensive margins of access to credit from other lenders. In other words, we evaluate changes in the probability of having a loan, as well as on the amount owed, two years after being exposed to the treatment. Since the data from the credit bureaus allow us to observe outstanding debt by type of credit and lender, we further disaggregate treatment impacts by the source of credit. Since we only observe the equilibrium outcomes, we cannot be sure if this is a demand- or a supply-driven effect. However, given the limited scale of our intervention in the target area, we do not expect formal lenders to respond by opening more branches or changing their credit risk assessment process. NGOs and cooperatives, which are more direct competitors of the savings groups, could react by offering more flexible terms or lower interest rates. In this case, it is unclear if the result in equilibrium is purely demand-driven.

Panel A in Table 8 shows that, on average, the treatment reduces the probability of having had a loan in the past 12 months. However, the probability of having received a loan from an informal lender is significantly increased among treated households. If we look at the heterogeneous effects by poverty level, we clearly note a composition effect: relatively poorer households are the ones that experience reductions in their probability of having an external loan, while relatively richer households increase their probability of having a loan from informal lenders. Similarly, panel B shows a tendency to reduce the level of outstanding debt from other lenders, particularly in poorer villages, but these effects are not statistically significant. Moreover, we find a positive treatment effect on the size of the loan balances that relatively richer households keep with informal lenders.

4.5 Alternative Mechanisms

4.5.1 Heterogeneous Impacts by Pre-Treatment Access to Formal Credit

All in all, the results in Table 8 suggest a modest shift away from traditional banking institutions among poorer households and increased preferences for NGOs and cooperatives among richer households. However, the introduction of savings groups may also have differential effects depending on the household's past credit history. For instance, providing access to the VSLA model to previously unbanked households can discourage them from engaging with other formal financial institutions once their demands for financial services are satisfied locally. This is particularly likely in the absence of information sharing between the savings groups and the financial system: previously excluded households cannot rely on their newly developed credit

history to make themselves more attractive to formal lenders.

Table 9 presents heterogeneous treatment impacts by previous access to credit from regulated formal lenders. Since the randomization was conducted at the village level, we rely on pre-treatment data from the credit bureau and measure the percentage of households with access to loans from a formal financial institution in the previous 12 months. Based on this variable, we define three groups of villages: high access (top quartile), low access (bottom quartile), and medium access (villages between the 25th and 75th percentiles).

In general, the treatment did not yield a significant change in the probability of having a loan in the past 12 months among households in villages with high and medium pre-treatment access to formal credit (see panel A). However, access to loans from other lenders is significantly reduced among those who live in low access villages: access to the VSLAs decreases the probability of having a loan from other lenders by 7 percentage points, which represents a 40% drop relative to the control group. This drop comes from a reduced demand for formal productive loans, suggesting that the loans provided by the savings group fulfill households' needs to fund their productive activities.

In terms of the amount of debt held, panel B shows a similar pattern: while the size of the outstanding debt among households in high and medium access villages is unaffected by the treatment, households in low access areas record a drop in their debt portfolio equivalent to -31.61%. Once more, this reduction in debt comes from a relatively lower reliance on productive loans from formal institutions. Households located in areas with medium access to formal credit experience increased reliance on loans from NGOs and cooperatives, which suggests that the VSLA methodology is better complemented with credit from local institutions rather than formal loans.

In sum, these results suggest that the treatment discourages the bancarization of households in villages with low pre-treatment access to loans from formal lenders. Relative to the control group, treated households experience changes in their loan portfolio, with reduced debt from banks and other formal institutions. Moreover, households in villages with medium and high access to formal sources of credit increase their indebtedness level with informal financial institutions.

4.5.2 Heterogeneous Impacts by Sex

Subsection 4.1 showed that women tend to be more likely to join a VSLA. In fact, our take-up analysis revealed that sex one of the very few observable traits that are associated with the demand for savings groups, signaling that women are in higher need of access to quality financial services.

We evaluate whether some of the effects are stronger among women relative to men in our sample. While most of the outcomes on well-being are measured at the household level, we can still look at the effects of the treatment on access to loans from external lenders by sex.

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Recall that the credit bureau records are aggregated at the household level and reflect the credit histories of both the household head and their partner.

Table 10 shows that the access to credit, as measured in terms of both the extensive and intensive margins, is not differentially impacted by the treatment when we look at the individual effects by sex. While women have lower probabilities to have a loan from other lenders than men (see column (1) versus column (3)), column (7) shows that the treatment impacts by sex are not statistically different.

5   Conclusions

Reaching the rural poor with adequate savings and credit services has proven to be extremely difficult for formal financial institutions around the world, even after incorporating lessons from the technologies put forward by the microfinance movement. The rural poor often have to resort to (and many times prefer) informal mechanisms to handle their financial needs, including crop diversification, borrowing from friends and neighbors, and saving cash at home, among others. Village banks and savings groups are probably the most popular group-based methodologies promoting financial inclusion among the rural poor. While both are based on peer support and pressure, savings groups have a more salient focus on savings-based services [Karlan et al., 2014].

Relying on a clustered randomized trial in 240 villages in rural Peru, we study the impact of VSLAs on poverty, risk-coping strategies, and access to credit from other lenders in rural Peru. Two years after the introduction of saving groups, households in treated localities exhibit a significant change in their risk management and coping strategies consistent with their improved access to savings and credit services. First, we observe that group members prefer to cover their financing needs through loans from the VSLA, holding precautionary savings. Households invest in improvements in housing quality that help improve health outcomes. We also see a drop in their health expenditures, particularly in the case of poorer households. Furthermore, the treatment led to a significant reduction in households' exposure to idiosyncratic shocks, an effect that is particularly strong in poorer villages, where we find important declines in exposure to hunger, death, and job loss.

Access to savings and credit through the savings groups also has important effects on the household's allocation of resources to diverse productive activities, particularly among poorer households. The treatment leads to greater specialization in agricultural businesses and a reduction in the number of livestock and crops held by the family. This reduced diversification among poorer households is consistent with an improvement in available financial services, and suggests that the intervention is providing them with the means to focus on activities for which they have a comparative advantage and/or a preference.

Our study also provides novel evidence on savings groups' longer-term effects on access to loans from other lenders. Relative to the control, the treated group shows reduced access to

formal loans and increased reliance on microfinance loans, which goes against the graduation hypothesis. The negative effect on access to formal loans is driven by villages with higher poverty levels and lower pre-treatment access to formal credit.

Our results raise a few key policy questions that need to be further studied. The first is whether charging administrative fees, as in Greaney et al. [2016], could help develop a business model that could improve the sustainability of savings groups around the world. A second question would be whether these groups could serve as a platform to reach the rural poor with additional complementary support to bring them above the poverty line and promote a better link to the formal financial system [Diaz-Martin et al., 2020]. Along those lines, it would be key to connect informal savings groups with formal financial institutions. If good repayment records and savings balances kept in the group become observable to other lenders, group members could rely on their (often newly created) credit histories to secure access to formal loans that can complement the funds they obtain from the VSLA.

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Figures and Tables

Figure 1: Study Timeline
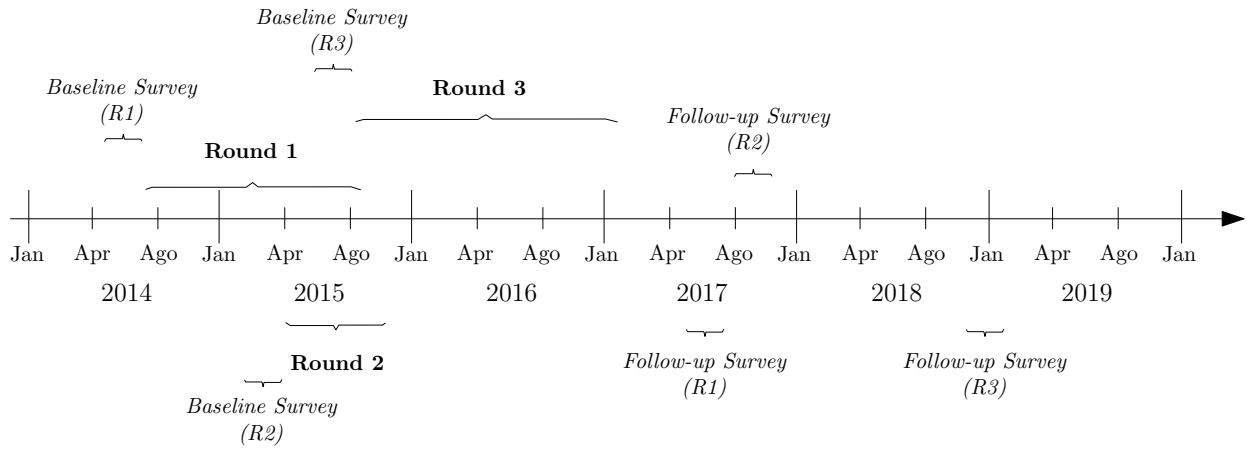
Note: Implementation activities in **bold** and data collection activities in *italics*.

Figure 2: Percentage Household Members Belonging a VSLA
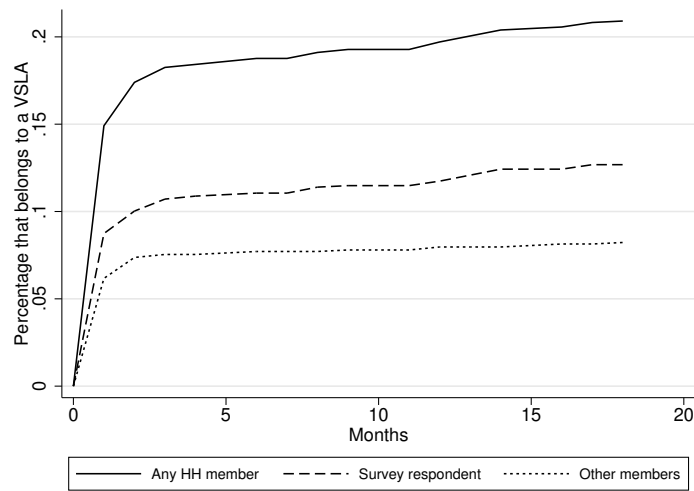
Note: Accumulated percentage up to 18 months after the creation of the corresponding VSLA.

Figure 3: Capital Accumulation and Mobilization of Funds in the VSLAs
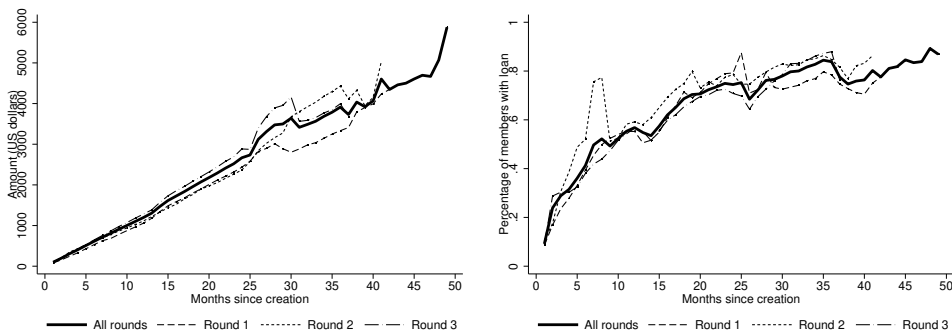
(a) Cumulative group capital

(b) Percentage of members with loans
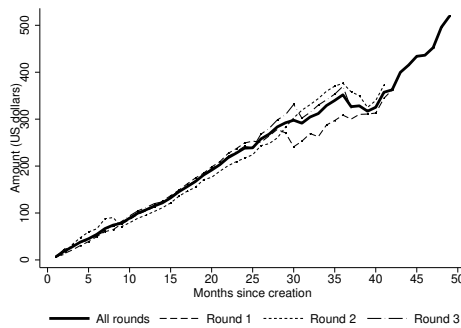
(c) Average loan size

Note: Panel (c) plots the average of loans disbursed divided by the number of members in the savings group. Amounts in panels (a) and (c) are expressed in dollars using a fixed exchange rate from August 2014.

Figure 4: Average Savings and Loan Transactions in the VSLAs: Savings Deposits and Withdrawals and Disbursement and Repayment of Loans

(a) Sales and Purchases

(b) Disbursement and Repayment
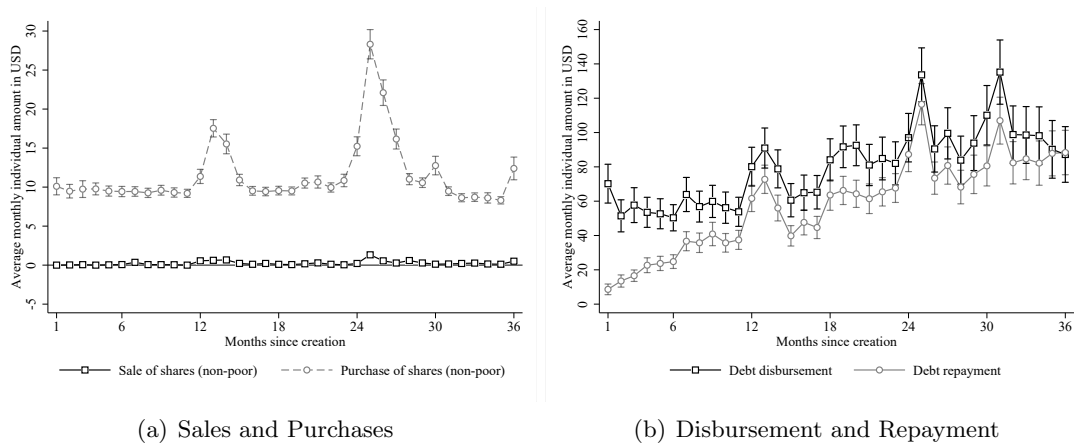
Note: Sales and purchases of stocks in panel (a) are equivalent to withdrawals and deposits of mandatory savings. Amounts in panels (a) and (b) expressed in dollars using a fixed exchange rate from August 2014.

Table 1: Determinants of affilliation to VSLAs

	Household	
	(1)	(2)
Age of household head	−0.002	−0.002
	(0.001)	(0.001)
Gender of household head: Female	0.120**	0.113**
	(0.051)	(0.050)
Marital status of household head: Married	0.060	0.077*
	(0.046)	(0.046)
Educational level of household head: without instruction	−0.008	−0.004
	(0.045)	(0.044)
Entrepreneurship level of respondent	−0.012	−0.014
	(0.017)	(0.017)
Level of financial knowledge of respondent	0.000	0.000
	(0.013)	(0.013)
Trust in people	0.018	0.016
	(0.015)	(0.015)
Trust in friends	−0.005	−0.004
	(0.016)	(0.016)
Trust in acquaintances	0.009	0.008
	(0.020)	(0.020)
Number of children	0.011	0.009
	(0.010)	(0.010)
Ratio of household members to bedrooms	−0.008	−0.007
	(0.010)	(0.010)
Most spoken language at home: Quechua	0.016	0.021
	(0.035)	(0.036)
Assets index		−0.006
		(0.010)
Previous participation in village banks		0.079*
		(0.045)
No previous access to formal financial sector		−0.038
		(0.029)
R2	0.083	0.088
Mean dependent variable	0.229	0.229
Observations	1169	1169

Note: All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable level at baseline, and a dummy that indicates whether the same person answered the baseline and the follow-up survey. We also include a dummy that indicates if an observation has missing data at the village level. In addition, we include a dummy that controls whether or not the respondent is the head of the household. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 2: Rotation and Retention

	Retention (as %)			
Years since creation	Mean	S.E.	95% C.I.	
1 year	0.84	0.018	0.799	0.870
2 years	0.64	0.026	0.589	0.690
3 years	0.29	0.029	0.235	0.347
	Rotation (rate)			
Years since creation	Mean	S.E.	95% C.I.	
1 year	1.33	0.105	1.122	1.534
2 years	1.18	0.075	1.033	1.329
3 years	1.03	0.070	0.896	1.172

Note: The retention rate reflects the percentage of members who are part of the VSLA since its creation. The rotation rate reflects the ratio of the number of new participants over the number of dropouts.

Table 3: Effects on Probability to Save and Financial Literacy by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	P-value (4)-(6) (7)
Pr(Savings)	0.531	0.071**††	0.569	0.070	0.505	0.072**†	0.965
	(0.017)	(0.027)	(0.026)	(0.044)	(0.022)	(0.036)	
Formal and informal	0.513	−0.011	0.533	0.005	0.499	−0.022	0.629
	(0.017)	(0.027)	(0.026)	(0.044)	(0.022)	(0.035)	
VSLAs	0.041	0.192***†††	0.080	0.179***†††	0.013	0.201***†††	0.659
	(0.011)	(0.022)	(0.017)	(0.040)	(0.015)	(0.027)	
Financial Literacy score	0.000	−0.007	0.056	−0.024	−0.039	0.004	0.816
	(0.034)	(0.056)	(0.053)	(0.090)	(0.044)	(0.075)	

Note: $N = 1,827$ observations. Pr(Save) is defined as a dichotomous variable that is equal to one whenever the household declares to hold formal or informal savings balances, including those kept in the VSLAs. Financial Literacy score is measured based on three questions that assess knowledge on interest rates, inflation rates, and investment diversification. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, † † † 1%) based on sharpened FDR q-values.

Table 4: Effects on Household Vulnerability by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	P-value (4)-(6) (7)
Issue during past 12 months	0.861	−0.050*	0.816	0.017	0.893	−0.094**	0.071
	(0.012)	(0.028)	(0.019)	(0.043)	(0.016)	(0.039)	
Hunger	0.369	−0.038	0.346	0.037	0.386	−0.088**	0.051
	(0.016)	(0.028)	(0.025)	(0.049)	(0.021)	(0.037)	
Disease	0.420	−0.036	0.442	−0.020	0.405	−0.047	0.644
	(0.016)	(0.027)	(0.026)	(0.044)	(0.021)	(0.036)	
Death	0.104	−0.047***††	0.096	−0.054*	0.109	−0.043**	0.750
	(0.009)	(0.016)	(0.014)	(0.028)	(0.012)	(0.019)	
Job loss	0.424	−0.047	0.404	−0.005	0.438	−0.074*	0.321
	(0.017)	(0.031)	(0.026)	(0.053)	(0.022)	(0.040)	
Theft	0.112	0.005	0.132	−0.004	0.098	0.012	0.631
	(0.011)	(0.016)	(0.017)	(0.029)	(0.014)	(0.018)	
Damage or loss at home	0.201	−0.021	0.209	−0.063*	0.196	0.006	0.151
	(0.013)	(0.022)	(0.021)	(0.036)	(0.017)	(0.030)	
Labor shortage	0.393	−0.026	0.393	0.000	0.393	−0.043	0.551
	(0.016)	(0.033)	(0.026)	(0.055)	(0.021)	(0.045)	
Crop loss	0.654	−0.015	0.607	0.017	0.687	−0.036	0.476
	(0.016)	(0.033)	(0.025)	(0.055)	(0.021)	(0.044)	
Livestock loss	0.314	−0.028	0.302	−0.043	0.322	−0.017	0.650
	(0.015)	(0.026)	(0.024)	(0.043)	(0.020)	(0.035)	

Note: $N = 1,827$ observations. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, † † † 1%) based on sharpened FDR q-values.

Table 5: Effects on Expenditures and Living Conditions by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	P-value (4)-(6) (7)
Monthly expenditure (log)	5.632	−0.023	5.664	−0.019	5.609	−0.026	0.962
	(0.042)	(0.063)	(0.065)	(0.099)	(0.055)	(0.088)	
Food expenditure (log)	4.723	−0.137	4.696	−0.078	4.742	−0.176	0.785
	(0.096)	(0.166)	(0.149)	(0.258)	(0.125)	(0.230)	
Health expenditure (log)	−0.454	−0.368*	−0.664	0.269	−0.307	−0.785***	0.018
	(0.134)	(0.213)	(0.209)	(0.340)	(0.174)	(0.272)††	
Other expenditure (log)	3.954	−0.082	3.990	−0.206	3.929	−0.001	0.333
	(0.056)	(0.091)	(0.087)	(0.151)	(0.073)	(0.128)	
Household assets index	−0.000	0.013	0.126	0.110	−0.088	−0.050	0.155
	(0.036)	(0.048)	(0.055)	(0.090)	(0.046)	(0.059)	
Housing quality index	−0.000	0.125**†	0.142	0.149	−0.099	0.110*	0.751
	(0.043)	(0.054)	(0.066)	(0.106)	(0.055)	(0.060)	
High quality material in walls	0.043	0.011	0.066	0.014	0.027	0.009	0.850
	(0.008)	(0.010)	(0.013)	(0.021)	(0.011)	(0.011)	
High quality material in floor	0.106	0.041**†	0.151	0.043	0.075	0.039*	0.927
	(0.011)	(0.017)	(0.018)	(0.032)	(0.015)	(0.021)	
High quality material in roof	0.021	0.018**†	0.033	0.027	0.013	0.012	0.474
	(0.007)	(0.009)	(0.011)	(0.017)	(0.009)	(0.010)	

Note: $N = 1,827$ observations. High quality material in walls: brick, cement, or stone mixed with lime or cement. High quality material in floors: parquet, wood, cement, tiles, or asphalt sheets. High quality material in roofs: reinforced concrete. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table 6: Effects on Productive Activities by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	P-value (4)-(6) (7)
Owns a non-agricultural business	0.062	0.001	0.066	0.040	0.060	−0.025*†	0.031
	(0.008)	(0.013)	(0.013)	(0.025)	(0.011)	(0.014)	
No. of non-agricultural business	0.068	−0.006	0.080	0.025	0.060	−0.027**†	0.115
	(0.010)	(0.015)	(0.015)	(0.030)	(0.012)	(0.014)	
No. of harvested crops	1.599	−0.220*	1.192	−0.035	1.883	−0.340**†	0.198
	(0.060)	(0.117)	(0.092)	(0.175)	(0.077)	(0.157)	
Sells harvested crops	0.258	0.014	0.223	0.023	0.282	0.007	0.775
	(0.015)	(0.026)	(0.023)	(0.042)	(0.019)	(0.035)	
Number of livestock	2.041	−0.429	1.484	0.374	2.430	−0.954**†	0.033
	(0.189)	(0.284)	(0.295)	(0.359)	(0.246)	(0.445)	

Note: $N = 1,827$ observations. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table 7: Effects on Information Network by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	P-value (4)-(6) (7)
Total number of people	1.749	−0.016	1.698	0.049	1.785	−0.059	0.525
	(0.036)	(0.081)	(0.057)	(0.119)	(0.047)	(0.113)	
By type of relationship							
Family	1.673	−0.026	1.580	0.037	1.739	−0.067	0.509
	(0.036)	(0.076)	(0.056)	(0.107)	(0.047)	(0.110)	
No Family	0.076	0.009	0.118	0.010	0.046	0.008	0.980
	(0.014)	(0.019)	(0.021)	(0.045)	(0.018)	(0.019)	
By place of residence							
Village	1.374	0.052	1.330	0.105	1.405	0.017	0.489
	(0.032)	(0.061)	(0.050)	(0.093)	(0.042)	(0.082)	
No village	0.375	−0.069	0.368	−0.058	0.380	−0.076	0.849
	(0.026)	(0.043)	(0.040)	(0.071)	(0.034)	(0.057)	

Note: $N = 1,827$ observations. The size of the network is measured as the number of people that the respondent consults before making important decisions. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable level at baseline, and a dummy that indicates whether the same person answered the baseline and the follow-up survey. Debt amounts expressed in dollars using a fixed exchange rate from August 2014, and winsorised at the 1% and 99% levels. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table 8: Effects on Access to Credit and Indebtedness, by District Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	P-value (4)-(6) (7)
A. Pr(Had a loan in the past 12m)	0.365	−0.033**	0.357	−0.003	0.370	−0.053**	0.142
	(0.016)	(0.017)	(0.025)	(0.024)	(0.021)	(0.023)	
Formal loans	0.305	−0.021	0.291	−0.003	0.315	−0.034	0.358
	(0.016)	(0.016)	(0.024)	(0.024)	(0.020)	(0.022)	
Productive loans	0.275	−0.016	0.255	0.011	0.288	−0.034	0.202
	(0.015)	(0.017)	(0.024)	(0.026)	(0.020)	(0.023)	
Consumption loans	0.078	−0.012	0.069	0.005	0.084	−0.022	0.211
	(0.009)	(0.011)	(0.014)	(0.015)	(0.012)	(0.015)	
Informal loans	0.104	0.026**	0.113	0.052***††	0.098	0.009	0.104
	(0.011)	(0.013)	(0.018)	(0.019)	(0.015)	(0.018)	
B. Outstanding debt (logs)	2.177	−0.106	2.018	−0.007	2.288	−0.170	0.509
	(0.117)	(0.123)	(0.182)	(0.178)	(0.152)	(0.168)	
Formal loans	1.825	−0.096	1.671	−0.037	1.933	−0.135	0.684
	(0.109)	(0.124)	(0.170)	(0.180)	(0.142)	(0.165)	
Productive loans	1.597	−0.032	1.438	0.107	1.708	−0.122	0.349
	(0.105)	(0.121)	(0.164)	(0.185)	(0.137)	(0.159)	
Consumption loans	0.360	−0.062	0.350	−0.102	0.367	−0.036	0.617
	(0.050)	(0.064)	(0.078)	(0.093)	(0.065)	(0.089)	
Informal loans	0.513	0.178**	0.555	0.235*	0.484	0.141	0.560
	(0.069)	(0.079)	(0.108)	(0.119)	(0.090)	(0.106)	

Note: $N = 1,827$ observations. The probability of having had a loan in the past 12 months and the size of outstanding debt are measured at the household level (i.e., aggregate records of head and spouse) 24 months after being exposed to the intervention. Loans are classified into productive and consumption debt, in the case of formal lenders. Loan balances are expressed in dollars using a fixed exchange rate from August 2014 and they are winsorised at the 1% and 99% levels. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, and the value of the dependent variable level at baseline. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table 9: Effects on Access to Credit and Indebtedness, by Village's Previous Level of Access to Credit from Formal Lenders

	Global		High Access		Medium Access		Low Access		P-value (4)-(8)	P-value (6)-(8)
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	Control Mean (7)	ITT Effect (8)	(9)	(10)
A. Pr(Had a loan in the past 12m)	0.365	−0.033**	0.591	−0.028	0.358	−0.019	0.176	−0.070*†	0.361	0.244
	(0.016)	(0.017)	(0.032)	(0.030)	(0.023)	(0.026)	(0.030)	(0.036)		
Formal loans	0.305	−0.021	0.524	0.001	0.291	−0.010	0.137	−0.066**†	0.116	0.170
	(0.016)	(0.016)	(0.031)	(0.029)	(0.022)	(0.027)	(0.029)	(0.031)		
Productive loans	0.275	−0.016	0.481	0.002	0.261	−0.002	0.116	−0.068**†	0.115	0.108
	(0.015)	(0.017)	(0.030)	(0.032)	(0.021)	(0.027)	(0.029)	(0.031)		
Consumption loans	0.078	−0.012	0.144	−0.005	0.072	−0.027*	0.030	0.000	0.871	0.198
	(0.009)	(0.011)	(0.018)	(0.026)	(0.013)	(0.014)	(0.017)	(0.017)		
Informal loans	0.104	0.026**	0.149	0.025	0.108	0.034	0.056	0.003	0.503	0.277
	(0.011)	(0.013)	(0.023)	(0.026)	(0.016)	(0.021)	(0.022)	(0.020)		
B. Outstanding debt (logs)	2.177	−0.106	3.932	−0.258	2.069	0.082	0.816	−0.380*	0.696	0.107
	(0.117)	(0.123)	(0.233)	(0.246)	(0.165)	(0.191)	(0.219)	(0.214)		
Formal loans	1.825	−0.096	3.354	−0.191	1.712	0.022	0.676	−0.260	0.841	0.302
	(0.109)	(0.124)	(0.219)	(0.285)	(0.154)	(0.190)	(0.207)	(0.193)		
Productive loans	1.597	−0.032	2.962	−0.038	1.489	0.045	0.584	−0.241	0.531	0.289
	(0.105)	(0.121)	(0.211)	(0.266)	(0.148)	(0.195)	(0.200)	(0.184)		
Consumption loans	0.360	−0.062	0.700	−0.156	0.329	−0.057	0.115	−0.004	0.392	0.664
	(0.050)	(0.064)	(0.102)	(0.158)	(0.070)	(0.087)	(0.096)	(0.092)		
Informal loans	0.513	0.178**	0.778	0.118	0.538	0.339***††	0.229	−0.089	0.317	0.014
	(0.069)	(0.079)	(0.143)	(0.156)	(0.098)	(0.126)	(0.134)	(0.128)		

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Note: $N = 1,827$ observations. The probability of having had a loan in the past 12 months and the size of outstanding debt are measured at the household level (i.e., aggregate records of head and spouse) 24 months after being exposed to the intervention. Loans are classified into productive and consumption debt, in the case of formal lenders. Loan balances are expressed in dollars using a fixed exchange rate from August 2014 and they are winsorised at the 1% and 99% levels. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, and the value of the dependent variable level at baseline. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table 10: Effects on Access to Credit After Two Years, by Sex

	Global		Male		Female		P-value
	Control Mean (1)	ITT Effect (2)	Control Mean (3)	ITT Effect (4)	Control Mean (5)	ITT Effect (6)	(4)-(6) (7)
A. Pr(Had a loan in the past 12m)	0.360	−0.024	0.455	−0.040*	0.252	−0.002	0.251
	(0.015)	(0.017)	(0.020)	(0.024)	(0.022)	(0.022)	
Formal loans	0.290	−0.018	0.388	−0.025	0.178	−0.005	0.521
	(0.014)	(0.016)	(0.019)	(0.024)	(0.021)	(0.019)	
Productive loans	0.256	−0.015	0.346	−0.028	0.153	0.005	0.287
	(0.014)	(0.016)	(0.019)	(0.025)	(0.020)	(0.018)	
Consumption loans	0.070	−0.009	0.100	−0.008	0.036	−0.009	0.928
	(0.008)	(0.010)	(0.011)	(0.016)	(0.012)	(0.011)	
Informal loans	0.098	0.018	0.100	0.019	0.095	0.018	0.981
	(0.010)	(0.012)	(0.014)	(0.016)	(0.015)	(0.017)	
B. Outstanding debt (logs)	2.060	−0.047	2.588	−0.062	1.456	−0.011	0.830
	(0.106)	(0.123)	(0.143)	(0.177)	(0.153)	(0.160)	
Formal loans	1.678	−0.098	2.251	−0.063	1.021	−0.115	0.821
	(0.098)	(0.116)	(0.132)	(0.177)	(0.141)	(0.145)	
Productive loans	1.455	−0.038	1.938	−0.044	0.901	−0.012	0.890
	(0.094)	(0.112)	(0.127)	(0.178)	(0.136)	(0.139)	
Consumption loans	0.315	−0.042	0.441	0.018	0.170	−0.105*	0.260
	(0.044)	(0.058)	(0.060)	(0.094)	(0.064)	(0.058)	
Informal loans	0.474	0.124*	0.438	0.110	0.516	0.138	0.845
	(0.061)	(0.068)	(0.084)	(0.096)	(0.090)	(0.101)	

Note: $N = 2,123$ observations. The probability of having had a loan in the past 12 months and the size of outstanding debt are measured at the household level (i.e., aggregate records of head and spouse) 24 months after being exposed to the intervention. Loans are classified into productive and consumption debt, in the case of formal lenders. Loan balances are expressed in dollars using a fixed exchange rate from August 2014 and they are winsorised at the 1% and 99% levels. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, and the value of the dependent variable level at baseline. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.
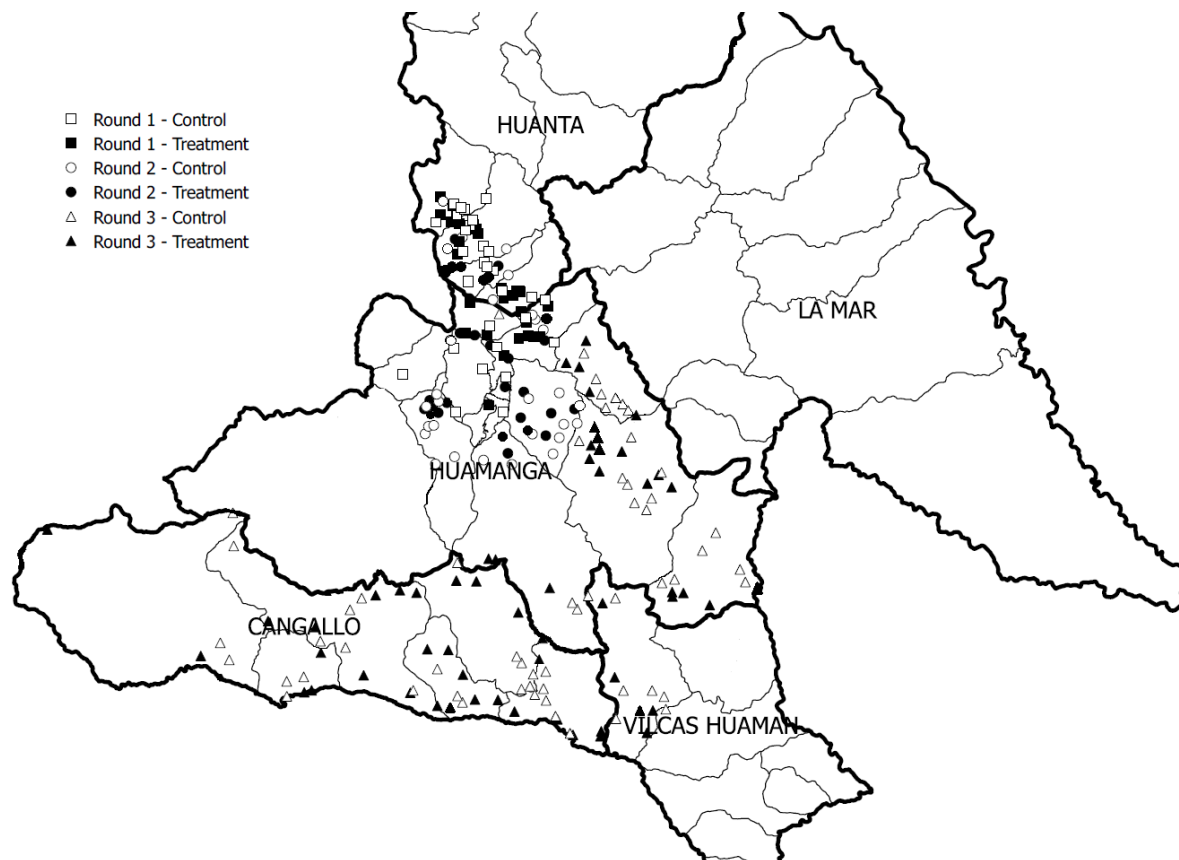
A Appendix

Figure A.1: Villages Included in the Experiment

Note: The map represents the treated and control villages in the department of Ayacucho, including provinces Huanta, Huamanga, Cangallo and Vilcas Huaman. The lines with the largest width delimit province borders, while the lighter ones refer to district borders. The black filled shapes represent the treated villages, while the unfilled shapes represent the control villages. The squares represent the first round; circles are the second round, and triangles are the third round.

Table A.1: Villages Randomization Balance Check

Variable	Control mean (1)	T-C (2)	N (3)
Total population	236.838 [133.501]	-6.312 [17.311]	235
Percentage of households with adequate drainage service	0.692 [0.249]	0.007 [0.035]	235
Percentage of households that have electricity by public grid	0.358 [0.327]	0.027 [0.029]	235
Literacy rate	0.711 [0.075]	0.011 [0.008]	235
There is any health facility	0.171 [0.400]	0.016 [0.047]	235
There is a full equiped hospital	0.000 [0.000]	0.000 [0.000]	235
There is a health center	0.000 [0.000]	0.000 [0.000]	235
There is a posta	0.171 [0.400]	0.016 [0.047]	235
There is a school of any educational level	0.692 [0.464]	-0.031 [0.064]	235
There is a school of early childhood educational level	0.265 [0.443]	-0.011 [0.057]	235
There is a school of primary educational level	0.598 [0.492]	-0.056 [0.058]	235
There is a school of secondary educational level	0.137 [0.345]	-0.001 [0.042]	235

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

Table A.2: Number of Individuals at Baseline and Follow-up

		Baseline			Follow-up		
		Treatment	Control	Total	Treatment	Control	Total
Round 1	Individuals	278	316	594	213	180	393
	Villages	*31*	*31*	*62*	*31*	*30*	*61*
Round 2	Individuals	281	260	541	235	216	451
	Villages	*27*	*27*	*54*	*27*	*27*	*54*
Round 3	Individuals	610	624	1234	494	489	983
	Villages	*62*	*62*	*124*	*62*	*61*	*123*
Total number of surveys		1169	1200	2369	942	885	1827
Total number of villages		*120*	*120*	*240*	*120*	*118*	*238*

Note: The two villages not reported in the follow-up were lost due to access problems.

Table A.3: Balance - Individual characteristics and productive activities

Variable	Control mean (1)	T-C (2)	N (3)
Age	41.577	0.251	2369
	[12.501]	[0.584]	
Education: At least secondary education	0.190	−0.017	2369
	[0.392]	[0.020]	
Quechua as most used language at home	0.823	−0.003	2369
	[0.382]	[0.028]	
Marital status: married or cohabitant	0.830	0.025	2369
	[0.376]	[0.016]	
Housing quality index (floor, ceiling, wall)	0.000	0.125	2369
	[1.000]	[0.085]	
Asset Index	0.000	0.059	2369
	[1.000]	[0.057]	
Family labor allocation (weekly hours)	54.355	0.967	2369
	[25.363]	[1.425]	
Family farm unit	26.188	1.901	2369
	[21.024]	[1.390]	
Family business	4.184	−0.164	2369
	[14.490]	[0.702]	
Dependent work	8.851	−1.237	2369
	[16.275]	[1.010]	
Domestic activities	15.132	0.467	2369
	[13.739]	[0.756]	
Has a family business	0.954	0.022	2369
	[0.209]	[0.011]*	
Non-agricultural	0.165	0.029	2369
	[0.371]	[0.024]	
Agricultural	0.859	0.053	2369
	[0.348]	[0.025]**	
Livestock	0.742	0.041	2369
	[0.438]	[0.029]	
Forestry	0.052	0.001	2369
	[0.221]	[0.016]	
Sell at least part of the agricultural crop	0.350	0.017	2369
	[0.477]	[0.040]	

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

Table A.4: Balance - Business attitudes, social capital and household vulnerability

Variable	Control mean	T-C	N
	(1)	(2)	(3)
Entrepreneurship index	0.000	0.081	2369
	[1.000]	[0.068]	
Financial knowledge index	0.000	0.008	2369
	[1.000]	[0.056]	
Trust index	0.000	0.131	2369
	[1.000]	[0.062]**	
In people, in general	−0.000	0.095	2369
	[1.000]	[0.060]	
In friends	0.000	0.113	2369
	[1.000]	[0.061]*	
Among his acquaintances	−0.000	0.128	2369
	[1.000]	[0.058]**	
Problems experienced at home in the last year (No.)	1.759	0.085	2369
	[1.709]	[0.120]	
Long illnesses or death	0.271	0.003	2369
	[0.445]	[0.023]	
Job loss	0.178	0.013	2369
	[0.383]	[0.026]	
Loss of crops or livestock	0.558	0.034	2369
	[0.497]	[0.033]	
Others	0.410	0.012	2369
	[0.492]	[0.031]	

Note: Significance levels (* 10%; ** 5%; *** 1%) captured through OLS estimation accounting for clustered (village) standard errors. Standard errors (deviations) of coefficients (control means) are in brackets. Financial knowledge is measured based on three questions that assess knowledge on interest rates, inflation rates, and investment diversification. Entrepreneurship index based on: propensity for new ideas and solutions, persistence in plans, seeking improvement of activities, communicativeness and sociability, goals and re-evaluation of goals, peer motivation, expectations about government, preference for not receiving orders.

Table A.5: Balance - Attitudes towards savings and credit history

Variable	Control mean (1)	T-C (2)	N (3)
Usage of extra money			
Spends it	0.541	0.007	2369
	[0.499]	[0.026]	
Saves it	0.384	0.003	2369
	[0.487]	[0.028]	
Savings attitudes			
Saves after expenses	0.545	0.024	2369
	[0.498]	[0.028]	
Regrets spending	0.688	0.023	2369
	[0.463]	[0.026]	
Wants to save more than his/her spouse	0.538	0.018	2369
	[0.499]	[0.033]	
Saves his/her money separately	0.335	0.048	2369
	[0.472]	[0.027]*	
Places where money is kept			
Inside the home	0.298	0.027	2369
	[0.458]	[0.028]	
Outside the home	0.052	0.018	2369
	[0.221]	[0.013]	
Household has at least one loan	0.254	0.049	2369
	[0.436]	[0.027]*	
Formal	0.061	−0.002	2369
	[0.239]	[0.011]	
Informal	0.254	0.049	2369
	[0.436]	[0.027]*	

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

Table A.6: Attrition Level at Follow-up by Treatment Status

	Household		Respondent	
	Full sample (1)	Rounds 2 & 3 (2)	Full sample (3)	Rounds 2 & 3 (4)
Treatment	0.058**	0.002	0.025	-0.015
	(0.023)	(0.023)	(0.023)	(0.025)
R-squared	0.056	0.048	0.068	0.060
Mean in control	0.738	0.798	0.564	0.613
Observations	2369	1775	2369	1775

Note: All regressions include individual characteristics such as age, gender, in a couple, speaks native language, uneducated, and also the census characteristics of each populated center used in randomization as controls, and district fixed effects. We also include a dummy to control whether or not an observation has missing data for its characteristics at the village level. The variables in columns (1) and (2) correspond to the socioeconomic characteristics of the head of household. We include age, gender, martial status, most spoken language at home, educational level, entrepreneurship level, level of financial knowledge, confidence level in people, friends and acquaintances, and participation in savings groups as controls. Columns (2) and (4) include only those surveyed in round 2 and 3. Errors clustered at the community level. *** p<0.01,** p<0.05,* p<0.1.

Table A.7: TOT Effects on Probability to Save and Financial Literacy by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	P-value (4)-(6) (7)
Pr(Savings)	0.531	0.370***††	0.569	0.388**	0.505	0.360**†	0.908
	(0.017)	(0.126)	(0.026)	(0.198)	(0.022)	(0.157)	
Formal and informal	0.513	−0.060	0.533	0.022	0.499	−0.107	0.642
	(0.017)	(0.140)	(0.026)	(0.228)	(0.022)	(0.169)	
Financial Literacy score	0.000	−0.038	0.056	−0.128	−0.039	0.015	0.808
	(0.034)	(0.288)	(0.053)	(0.471)	(0.044)	(0.358)	

Note: $N = 1,827$ observations. Pr(Save) is defined as a dichotomous variable that is equal to one whenever the household declares to hold formal or informal savings balances, including those kept in the VSLAs. Financial Literacy score is measured based on three questions that assess knowledge on interest rates, inflation rates, and investment diversification. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.8: TOT Effects on Household Vulnerability by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	P-value (4)-(6) (7)
Issue during past 12 months	0.861	−0.261*	0.816	0.074	0.893	−0.452**	0.080
	(0.012)	(0.147)	(0.019)	(0.229)	(0.016)	(0.188)	
Hunger	0.369	−0.200	0.346	0.179	0.386	−0.418**†	0.061
	(0.016)	(0.144)	(0.025)	(0.265)	(0.021)	(0.177)	
Disease	0.420	−0.188	0.442	−0.115	0.405	−0.231	0.693
	(0.016)	(0.142)	(0.026)	(0.237)	(0.021)	(0.175)	
Death	0.104	−0.244***††	0.096	−0.297*	0.109	−0.214**†	0.640
	(0.009)	(0.082)	(0.014)	(0.155)	(0.012)	(0.091)	
Job loss	0.424	−0.243	0.404	−0.045	0.438	−0.358*	0.354
	(0.017)	(0.160)	(0.026)	(0.279)	(0.022)	(0.191)	
Theft	0.112	0.028	0.132	−0.020	0.098	0.056	0.645
	(0.011)	(0.080)	(0.017)	(0.151)	(0.014)	(0.084)	
Damage or loss at home	0.201	−0.112	0.209	−0.336	0.196	0.018	0.162
	(0.013)	(0.116)	(0.021)	(0.211)	(0.017)	(0.145)	
Labor shortage	0.393	−0.136	0.393	−0.008	0.393	−0.209	0.571
	(0.016)	(0.174)	(0.026)	(0.288)	(0.021)	(0.211)	
Crop loss	0.654	−0.077	0.607	0.084	0.687	−0.169	0.481
	(0.016)	(0.171)	(0.025)	(0.291)	(0.021)	(0.210)	
Livestock loss	0.314	−0.144	0.302	−0.237	0.322	−0.092	0.613
	(0.015)	(0.135)	(0.024)	(0.238)	(0.020)	(0.165)	

Note: $N = 1,827$ observations. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.9: Effects on Expenditures and Living Conditions by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	P-value (4)-(6) (7)
Monthly expenditure (log)	5.632	−0.120	5.664	−0.108	5.609	−0.127	0.978
	(0.042)	(0.326)	(0.065)	(0.521)	(0.055)	(0.418)	
Food expenditure (log)	4.723	−0.713	4.696	−0.457	4.742	−0.861	0.819
	(0.096)	(0.869)	(0.149)	(1.371)	(0.125)	(1.119)	
Health expenditure (log)	−0.454	−1.926*	−0.664	1.260	−0.307	−3.75***††	0.023
	(0.134)	(1.117)	(0.209)	(1.832)	(0.174)	(1.350)	
Other expenditure (log)	3.954	−0.429	3.990	−1.105	3.929	−0.039	0.312
	(0.056)	(0.472)	(0.087)	(0.826)	(0.073)	(0.610)	
Household assets index	−0.000	0.067	0.126	0.574	−0.088	−0.225	0.154
	(0.036)	(0.246)	(0.055)	(0.483)	(0.046)	(0.281)	
Housing quality index	−0.000	0.658**†	0.142	0.833	−0.099	0.559*	0.684
	(0.043)	(0.297)	(0.066)	(0.612)	(0.055)	(0.303)	
High quality material in walls	0.043	0.058	0.066	0.077	0.027	0.048	0.810
	(0.008)	(0.054)	(0.013)	(0.113)	(0.011)	(0.052)	
High quality material in floor	0.106	0.211**†	0.151	0.237	0.075	0.196*	0.837
	(0.011)	(0.091)	(0.018)	(0.172)	(0.015)	(0.103)	
High quality material in roof	0.021	0.094**†	0.033	0.147	0.013	0.063	0.459
	(0.007)	(0.048)	(0.011)	(0.103)	(0.009)	(0.048)	

Note: $N = 1,827$ observations. High quality material in walls: brick, cement, or stone mixed with lime or cement. High quality material in floors: parquet, wood, cement, tiles, or asphalt sheets. High quality material in roofs: reinforced concrete. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.10: Effects on Productive Activities by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	P-value (4)-(6) (7)
Owns a non-agricultural business	0.062	0.004	0.066	0.206	0.060	−0.113*†	0.034
	(0.008)	(0.066)	(0.013)	(0.137)	(0.011)	(0.066)	
No. of non-agricultural business	0.068	−0.033	0.080	0.130	0.060	−0.127*†	0.126
	(0.010)	(0.075)	(0.015)	(0.160)	(0.012)	(0.066)	
No. of harvested crops	1.599	−1.145*	1.192	−0.262	1.883	−1.65**†	0.233
	(0.060)	(0.622)	(0.092)	(0.934)	(0.077)	(0.770)	
Sells harvested crops	0.258	0.072	0.223	0.127	0.282	0.040	0.750
	(0.015)	(0.136)	(0.023)	(0.220)	(0.019)	(0.169)	
Number of animals	2.041	−2.239	1.484	1.746	2.430	−4.56**†	0.037
	(0.189)	(1.471)	(0.295)	(1.903)	(0.246)	(2.170)	

Note: $N = 1,827$ observations. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable at baseline, a dummy that indicates whether the same person answered the baseline and the follow-up survey, and controls for rounds. We also include a dummy that indicates if an observation has missing data at the village level. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Daggers denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.11: TOT Effects on Information Network by District's Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	P-value (4)-(6) (7)
Total number of people	1.749	−0.083	1.698	0.249	1.785	−0.275	0.521
	(0.036)	(0.414)	(0.057)	(0.626)	(0.047)	(0.536)	
By type of relationship							
Family	1.673	−0.136	1.580	0.181	1.739	−0.318	0.507
	(0.036)	(0.393)	(0.056)	(0.562)	(0.047)	(0.517)	
No Family	0.076	0.047	0.118	0.054	0.046	0.043	0.965
	(0.014)	(0.099)	(0.021)	(0.237)	(0.018)	(0.089)	
By place of residence							
Comunidad	1.374	0.270	1.330	0.563	1.405	0.101	0.472
	(0.032)	(0.319)	(0.050)	(0.520)	(0.042)	(0.397)	
No Comunidad	0.375	−0.359	0.368	−0.328	0.380	−0.377	0.916
	(0.026)	(0.232)	(0.040)	(0.395)	(0.034)	(0.273)	

Note: $N = 1,827$ observations. The size of the network is measured as the number of people that the respondent consults before making important decisions. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, the value of the dependent variable level at baseline, and a dummy that indicates whether the same person answered the baseline and the follow-up survey. Debt amounts expressed in dollars using a fixed exchange rate from August 2014, and winsorised at the 1% and 99% levels. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.12: TOT Effects on Access to Credit and Indebtedness, by District Level of Poverty

	Global		Non-poor		Poor		
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	P-value (4)-(6) (7)
A. Pr(Had a loan in the past 12m)	0.365	−0.174**	0.357	−0.034	0.370	−0.257**	0.142
	(0.016)	(0.088)	(0.025)	(0.125)	(0.021)	(0.114)	
Formal loans	0.305	−0.112	0.291	−0.023	0.315	−0.163	0.358
	(0.016)	(0.085)	(0.024)	(0.127)	(0.020)	(0.108)	
Productive loans	0.275	−0.086	0.255	0.047	0.288	−0.163	0.202
	(0.015)	(0.087)	(0.024)	(0.134)	(0.020)	(0.110)	
Consumption loans	0.078	−0.060	0.069	0.021	0.084	−0.107	0.211
	(0.009)	(0.056)	(0.014)	(0.081)	(0.012)	(0.073)	
Informal loans	0.104	0.137*	0.113	0.279**†	0.098	0.053	0.104
	(0.011)	(0.070)	(0.018)	(0.112)	(0.015)	(0.086)	
B. Outstanding debt (logs)	2.177	−0.555	2.018	−0.093	2.288	−0.821	0.509
	(0.117)	(0.634)	(0.182)	(0.932)	(0.152)	(0.802)	
Formal loans	1.825	−0.503	1.671	−0.232	1.933	−0.659	0.684
	(0.109)	(0.631)	(0.170)	(0.940)	(0.142)	(0.786)	
Productive loans	1.597	−0.165	1.438	0.536	1.708	−0.569	0.349
	(0.105)	(0.625)	(0.164)	(0.999)	(0.137)	(0.755)	
Consumption loans	0.360	−0.323	0.350	−0.553	0.367	−0.191	0.617
	(0.050)	(0.327)	(0.078)	(0.477)	(0.065)	(0.424)	
Informal loans	0.513	0.930**	0.555	1.291*	0.484	0.721	0.560
	(0.069)	(0.429)	(0.108)	(0.696)	(0.090)	(0.521)	

Note: $N = 1,827$ observations. The probability of having had a loan in the past 12 months and the size of outstanding debt are measured at the household level (i.e., aggregate records of head and spouse) 24 months after being exposed to the intervention. Loans are classified into productive and consumption debt, in the case of formal lenders. Loan balances are expressed in dollars using a fixed exchange rate from August 2014 and they are winsorised at the 1% and 99% levels. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, and the value of the dependent variable level at baseline. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.13: TOT Effects on Access to Credit and Indebtedness, by Village's Previous Level of Access to Credit from Formal Lenders

	Global		High Access		Medium Access		Low Access		P-value (4)-(8)	P-value (6)-(8)
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	Control Mean (7)	TOT Effect (8)	(9)	(10)
A. Pr(Had a loan in the past 12m)	0.365	−0.174**	0.591	−0.123	0.358	−0.082	0.176	−1.008	0.361	0.244
	(0.016)	(0.088)	(0.032)	(0.124)	(0.023)	(0.113)	(0.030)	(0.789)		
Formal loans	0.305	−0.112	0.524	−0.002	0.291	−0.045	0.137	−0.960	0.116	0.170
	(0.016)	(0.085)	(0.031)	(0.117)	(0.022)	(0.117)	(0.029)	(0.691)		
Productive loans	0.275	−0.086	0.481	0.002	0.261	−0.009	0.116	−0.982	0.115	0.108
	(0.015)	(0.087)	(0.030)	(0.128)	(0.021)	(0.118)	(0.029)	(0.724)		
Consumption loans	0.078	−0.060	0.144	−0.022	0.072	−0.119**	0.030	0.008	0.871	0.198
	(0.009)	(0.056)	(0.018)	(0.105)	(0.013)	(0.061)	(0.017)	(0.245)		
Informal loans	0.104	0.137*	0.149	0.107	0.108	0.150	0.056	0.034	0.503	0.277
	(0.011)	(0.070)	(0.023)	(0.106)	(0.016)	(0.096)	(0.022)	(0.291)		
B. Outstanding debt (logs)	2.177	−0.555	3.932	−1.062	2.069	0.369	0.816	−5.495	0.696	0.107
	(0.117)	(0.634)	(0.233)	(0.999)	(0.165)	(0.816)	(0.219)	(4.140)		
Formal loans	1.825	−0.503	3.354	−0.792	1.712	0.103	0.676	−3.748	0.841	0.302
	(0.109)	(0.631)	(0.219)	(1.154)	(0.154)	(0.815)	(0.207)	(3.301)		
Productive loans	1.597	−0.165	2.962	−0.163	1.489	0.201	0.584	−3.481	0.531	0.289
	(0.105)	(0.625)	(0.211)	(1.066)	(0.148)	(0.842)	(0.200)	(3.155)		
Consumption loans	0.360	−0.323	0.700	−0.644	0.329	−0.249	0.115	−0.041	0.392	0.664
	(0.050)	(0.327)	(0.102)	(0.639)	(0.070)	(0.370)	(0.096)	(1.306)		
Informal loans	0.513	0.930**	0.778	0.528	0.538	1.490***†	0.229	−1.310	0.317	0.014
	(0.069)	(0.429)	(0.143)	(0.637)	(0.098)	(0.576)	(0.134)	(1.837)		

Note: $N = 1,827$ observations. The probability of having had a loan in the past 12 months and the size of outstanding debt are measured at the household level (i.e., aggregate records of head and spouse) 24 months after being exposed to the intervention. Loans are classified into productive and consumption debt, in the case of formal lenders. Loan balances are expressed in dollars using a fixed exchange rate from August 2014 and they are winsorised at the 1% and 99% levels. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, and the value of the dependent variable level at baseline. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.

Table A.14: TOT Effects on Access to Credit After Two Years, by Sex

	Global		Male		Female		P-value
	Control Mean (1)	TOT Effect (2)	Control Mean (3)	TOT Effect (4)	Control Mean (5)	TOT Effect (6)	(4)-(6) (7)
A. Pr(Had a loan in the past 12m)	0.360	−0.121	0.455	−0.206*	0.252	−0.010	0.251
	(0.015)	(0.082)	(0.020)	(0.122)	(0.022)	(0.101)	
Formal loans	0.290	−0.087	0.388	−0.131	0.178	−0.024	0.521
	(0.014)	(0.078)	(0.019)	(0.123)	(0.021)	(0.089)	
Productive loans	0.256	−0.072	0.346	−0.146	0.153	0.022	0.287
	(0.014)	(0.080)	(0.019)	(0.127)	(0.020)	(0.084)	
Consumption loans	0.070	−0.044	0.100	−0.040	0.036	−0.043	0.928
	(0.008)	(0.049)	(0.011)	(0.081)	(0.012)	(0.050)	
Informal loans	0.098	0.091	0.100	0.099	0.095	0.084	0.981
	(0.010)	(0.059)	(0.014)	(0.082)	(0.015)	(0.080)	
B. Outstanding debt (logs)	2.060	−0.233	2.588	−0.318	1.456	−0.050	0.830
	(0.106)	(0.598)	(0.143)	(0.893)	(0.153)	(0.733)	
Formal loans	1.678	−0.483	2.251	−0.338	1.021	−0.532	0.821
	(0.098)	(0.563)	(0.132)	(0.892)	(0.141)	(0.666)	
Productive loans	1.455	−0.190	1.938	−0.229	0.901	−0.055	0.890
	(0.094)	(0.548)	(0.127)	(0.899)	(0.136)	(0.637)	
Consumption loans	0.315	−0.209	0.441	0.083	0.170	−0.483*	0.260
	(0.044)	(0.279)	(0.060)	(0.479)	(0.064)	(0.268)	
Informal loans	0.474	0.614*	0.438	0.587	0.516	0.637	0.845
	(0.061)	(0.347)	(0.084)	(0.497)	(0.090)	(0.473)	

Note: $N = 2,123$ observations. The probability of having had a loan in the past 12 months and the size of outstanding debt are measured at the household level (i.e., aggregate records of head and spouse) 24 months after being exposed to the intervention. Loans are classified into productive and consumption debt, in the case of formal lenders. Loan balances are expressed in dollars using a fixed exchange rate from August 2014 and they are winsorised at the 1% and 99% levels. All regressions include village characteristics such as population size, literacy rate, households with drains, households with electrical energy, education center with secondary level or less, and health center, as well as district fixed effects, and the value of the dependent variable level at baseline. We also include a dummy that indicates if an observation has missing data at the village level. Regressions also includes controls for rounds. Clustered errors at the village level in parentheses. Stars denote significance levels (* 10%; ** 5%; *** 1%) based on unadjusted p-values. Dags denote significance levels († 10%, †† 5%, ††† 1%) based on sharpened FDR q-values.