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EVALUATION OF THE IMPACT OF VILLAGE SAVINGS AND LOAN ASSOCIATIONS USING A NOVEL SURVEY INSTRUMENT

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ABSTRACT

Formal microfinance institutions have been an important tool in the fight against poverty in developing countries, but their reach is necessarily limited. Village Savings and Loan Associations (VSLAs) are an alternative, informal mechanism for saving and borrowing that do not require external capital or ongoing financial or administrative support from a founding organization. This paper evaluates the impact of VSLAs on their members and finds that long-term members fare better along multiple economic, nutritional, and health dimensions compared to a control group of recent joiners.

Keywords: microfinance; village savings and loans associations; Africa; Tanzania

1. INTRODUCTION

During the last decade, microfinance institutions have provided access to financial services to millions of people in developing countries. However, provision of financial services in rural areas remains a major challenge. With poor road quality and lower population density, it can be extremely costly for microfinance organizations to reach the rural poor and consequently, the great majority of rural areas lack access to any formal financial services.

To address this difficulty, CARE International, a nongovernmental humanitarian organization, designed a unique savings-based program called a Village Savings and Loan Association (VSLA). VSLAs allow the poor to become their own bankers. They are built entirely on member savings and interest from loans; they receive no direct capital investment from external organizations. Members, however, do receive a year of intensive training in group governance and money management, which allows them to become self-sufficient and even enables them to establish and train other groups.

As a self-sustainable and self-replicating approach, VSLAs have the potential to improve financial access in more remote areas, but the impact of these groups is not well understood. Previous research suggests that program participants have higher household wealth, better food security and health, and higher education expenditures (Allen and Hobane 2004; Anyango 2005; Anyango et al. 2006), but these studies suffer from methodological weaknesses that preclude interpreting these associations as causal.

The purpose of this study is to expand and improve upon the existing research to better understand the impact of the VSLA program. The study evaluates the impact of one of the oldest VSLA programs in Zanzibar, Tanzania. It is comprised of an individual questionnaire administered to 170 households, including those of current VSLA members, former members, and incipient members. The incipient members serve as a control group in order to isolate and assess the impact of the VSLAs on the longer-term members. The survey data is complemented by three focus group discussions as well as several interviews with key informants within CARE and its affiliated organizations. Finally, a thorough understanding of both the economic and social setting in which the program operates, as well as of the institution itself, facilitates interpretation of the data from the survey and focus group discussions.

The results suggest that participation in the VSLA program has an overall positive impact on various indicators of household and individual welfare, including asset expenditure levels, the development of income-generating activities (IGAs), spending on education, access to health services, nutritional levels, and quality of housing. Overall, these results suggest that the VSLA model is both sustainable and successful at reaching those who do not benefit from traditional microfinance programs.

2. BACKGROUND

(a) Village savings and loan associations (VSLAs)

Proponents have hailed the provision of formal financial services to the poor as an effective tool for alleviating poverty and fostering development. The underlying logic is that providing financial services to the poor enables them to manage their money differently, for example by investing, acquiring productive assets, acquiring new skills, or opening new businesses. Formal microfinance institutions, such as the well-known Grameen Bank, have arisen to funnel investor capital to individuals in developing countries in the form of small loans.

In addition to formal microfinance institutions, more informal mechanisms for saving and borrowing have been developed. One such approach is a rotating savings and credit association (ROSCA). In a ROSCA, a small group of people, generally between 15 and 30, form a group and contribute an agreed amount at regular meetings. The entire fund is then distributed to each member on a rotating basis, until everyone in the group has received a loan. Several studies have attempted to explain the motivation behind ROSCA participation. Anderson and Baland (2002) argue that ROSCA participation is an effective strategy used by women to protect their savings against claims from their husbands. Bauer and Morduch (2008), Gugerty (2007), and Dagnelie and LeMay-Boucher (2008) suggest that individuals use participation in a ROSCA as a device to commit themselves to save money and to deal with self-control problems. Besley, Coate and Loury (1993) argue that individuals who have no access to credit may choose to join a ROSCA to finance the purchase of indivisible durable goods, taking advantage of the gains from intertemporal trade between individuals.

The village savings and loan association (VSLA) model developed by CARE

International improves upon the ROSCA approach in several ways. First, borrowing from the group savings can be done at any time, making it easier for individuals to time their borrowing to better match their consumption-smoothing needs or investment opportunities. Second, members can contribute differing amounts enabling those with greater means to save more, thus increasing the potential amount available to be lent. Finally, borrowers pay interest on loans to the group, which should encourage more savings from those with greater means while simultaneously discouraging borrowing for less productive purposes. The net effect should be that more capital is provided by better off members and used by borrowers for more productive purposes.

This study examines the VSLA program in Zanzibar, Tanzania. Tanzania has the highest rate of extreme poverty in the world, with 88.5 percent of the population subsisting on less than US$1.25 per day and 96.6 percent on less than US$2 per day (World Bank 2009a). The Tanzanian population is also poorly educated – in 2007 only 69.4 percent were literate (World Bank 2009b). Access to credit is severely limited. As of 2007, just 10 percent of the population had access to formal financial services, up from 6.4 percent in 2001 (World Bank 2009a).

In the region of this study, a VSLA consists of 15 to 30 people who save a small amount every week. A share is usually Tsh1,000 (US$0.90) with members contributing up to three shares per week, which corresponds to approximately 8 percent of average weekly income. The value of each share remains low so as to allow the poorest members to participate. The group's funds are kept in a cash box that is fitted with three padlocks, the keys of which are held by different officers in

the group. This system improves transparency and makes it easier to refuse loans to non-members, such as one's husband (Allen and Staehle 2007). After several months, the savings accumulated by the group become large enough to launch the loan function. All members have the right to take out a loan regardless of the number of shares they have contributed, but can only take out a loan equal to at most three times the value of their shares. Most loans are short-term, generally around one month, at an interest rate determined by the group, usually 5 percent per month. This is low compared to moneylenders who often charge up to 30 percent per month, but slightly higher than non-governmental organization affiliated microfinance institutions, which generally charge less than 4 percent per month (Mutesasira 1999). Each group is able to set their own repayment terms. However, a VSLA never fines borrowers for late loan repayment as this may aggravate any underlying crisis the household may be facing. It is assumed that the embarrassment of being late is sufficient penalty (Allen and Staehle 2007).

On a date chosen by the members, usually after about a year, the savings and accrued interest are divided among the members in proportion to each individual's savings. This event, known as an "auction audit," is usually scheduled so as to occur when members are most likely to need money, such as at the start of the school year or before a major holiday, in order to encourage the use of savings to meet pressing needs and discourage their use for unnecessary expenditures. After the disbursement of funds, the groups normally re-form immediately and start a new cycle of savings and lending.

The VSLA model is lauded for its transparency and adaptability for illiterate

members. All operations (deposits, withdrawals, loans, loan repayments) occur at weekly meetings with the entire group present so that all activities remain transparent. Record keeping was also designed to be as simple and as transparent as possible. Each member has an individual passbook, which is stamped every week, with each stamp representing one share. Only loan disbursement is recorded in the group ledger (Allen and Staehle 2007).

VSLAs are built entirely on member savings and interest from loans; they receive no direct capital investment from CARE or any other supporting organization. CARE's role is to supply extensive training on group dynamics, governance and money management. Each VSLA elects a Community Contact Person (CCP or village trainer). After approximately a year of supervision, if the CCP passes a certification test, the field officer from CARE moves on to another group and starts the process again, leaving the CCP in charge. Meanwhile, a local umbrella organization, called an Apex organization, is created to support and monitor existing groups while fostering the growth of new groups. After several years, once the necessary systems have been put in place, the Apex organization is left in charge of the continued promotion of the VSLA model and CARE is able to move on to new areas.

CARE first introduced the VSLA program in Zanzibar in 2001. After two years of successful implementation, CARE left the area, leaving the Jozani Credit Development Organization (JOCDO) to oversee the continuation of the model. Over the past seven years, under the guidance of JOCDO, the number of VSLAs in the area has grown to 233.

(b) Previous literature

Microfinance is often believed to help the poor to protect and diversify their sources of income, thus enabling increased household expenditures. MkNelly and Dunford (1999) find that clients of the Lower Pra Rural Bank Credit with Education program in Ghana increased their incomes by US$18 compared to non-clients, and significantly diversified their income sources. Similarly, Dunn and Arbunkle (2001) find that microfinance clients in Lima, Peru had over 50 percent higher income than non-clients. Khandker (2005) finds that each additional 100 Taka (US$1.22) of credit to women in Bangladesh increased total annual household expenditure by more than 20 Taka (US$0.24). There have been other studies that failed to find a beneficial effect. Masanjala and Tsoka (1997) and Ssendi and Anderson (2009) find little impact of microfinance participation on income or household assets.

The evidence on the impact of microfinance programs on education is similarly mixed. Children of microfinance clients are more likely to go to school and stay in school longer (Neponen 2003; Littlefield et al. 2003). Barnes (2001) finds that the Zambuko Trust program in Zimbabwe had a positive impact on the education of boys aged 6 to 16, but no effect on the education of girls within the client-household. Pitt and Khandker (1998), however, find that microfinance program participation in Bangladesh increased the probability of enrollment for girls. In Thailand, Coleman (1999) finds little impact on education expenditures, which may be seen as a proxy for either access to or quality of education.

Households of microfinance clients, particularly those of female clients, do generally seem to have better nutrition and health statuses compared to non-client households (Pronyk et al. 2007; Littlefield et al. 2003; Hossain 1988). Pitt et al. (2003) find that women's credit had a large and statistically significant impact on arm circumference and height-for-age in Bangladesh. Barnes (2001) finds that participation in Zambuko Trust in Zimbabwe had a positive impact on the frequency with which food is consumed in extremely poor households as well as on the quality of food. Specifically, participation led to a positive impact on the consumption of high protein foods (meat, fish, chicken, and milk). MkNelly and Dunford (1999) also find that children of participants of the Lower Pra Rural Bank Credit program in Ghana experienced significant improvements in feeding frequency compared to children of non-clients.

The impact of microfinance participation seems to differ significantly by gender. Income in the hands of women is more often spent to benefit the household and the children (Thomas 1990; Engle 1991; Schultz 1990). Therefore, when targeted towards women, microfinance loans are more likely to increase the overall welfare of the household, including the education, nutrition, and health of the children (Pitt and Khandker 1998; Pitt et al. 2003; Khandker 2005; Strauss and Beegle 1996; Hoddinott and Haddad 1994). Some research suggests that savings mechanisms also may be especially beneficial for women (Dupas and Robinson 2012a; Kabeer 2001). Anderson and Baland (2002) argue that more formal savings mechanisms allow women to protect their savings against claims from their husbands. Dupas and Robinson (2012b) and Schaner (2012) suggest that women also face constant

demands from relatives and neighbors and may find it difficult to refuse requests if the money is available in the house. Dupas and Robinson (2012a) find that four to six months after opening a savings account, women in Kenya had 45 percent higher daily investment in their business, 10 to 20 percent higher daily food expenditures, and were better able to afford medical expenses for serious illness.

Informal and semi-formal financial schemes are likely to have similar benefits to more formal savings mechanisms. Despite the prevalence of such schemes, the evidence on the impact of the mechanisms is very limited. In 2006, Decentralized Financial Services (DFS), a consulting group based in Kenya, carried out an impact study of a VSLA program in Zanzibar to examine its long-term sustainability and its impact on its members (Anyango et al. 2006). The study finds that VSLAs in Zanzibar have performed well in terms of growth and sustainability, and suggests that participation in the program led to improved living standards and housing, and increased income. Although these results are encouraging, the study does not have a baseline for members, does not use a control group, and no tests of statistical significance were performed.

However, other impact evaluations seem to find similar positive impacts to VSLA program participation. Allen and Hobane (2004) and Anyango (2005) conclude that in Zimbabwe and Malawi, respectively, membership in a VSLA contributed to an increase in household productive and non-productive asset levels among the majority of participants, as well as some improvement in quality of housing. The findings also suggest that program participation led to an increase in the number of income-generating activities (IGAs) and to an increase in stability of such

activities. In Tanzania, the Women's Empowerment Strategic Impact Inquiry (SII) found that female VSLA participants had higher savings, more income-generating activities, greater food security and health, and increased education expenditures (CARE Tanzania 2006).

3. METHODS

(a) Research design

This study uses data from an original survey of VSLA members in an attempt to elucidate the economic and social impacts of the program with a particular emphasis on the impact on female participants. Economic impact is measured principally through expenditure levels, the accumulation of household assets, and the development of income-generating activities (IGAs), such as fishing, tailoring, or carpentry. To estimate social impact, the study relies on a variety of indicators, including educational spending, access to health services, nutritional levels, and quality of housing.

It is likely that VSLA members systematically differ from the general population. The establishment of new VSLA groups involves a process of self-selection, in which the most energetic and highly-motivated men and women are more likely to become involved, while the marginalized or vulnerable may be overlooked. The poorest also may be excluded due to their inability to finance the purchase of shares. A comparison of VSLA members to the general population

therefore may be biased toward finding beneficial effects of the program. In order to address this problem and improve upon the methodology used in Anyango et al. (2006), we compare established VSLA members to a control group of new members who are still in the initial training phase. The use of new members as a control group offers two operational advantages. First, there is no need to identify and survey non-members in order to generate a control group - it can be particularly difficult to motivate such a group to take part in a time-consuming survey. Second, there is no need to follow clients over time, as in a longitudinal survey (Karlan 2001).

Using new members as a control group requires three major identifying assumptions:

1. No one drops out of the program or dropping out occurs for reasons orthogonal to the variables of interest.
2. There is no change in how selection of VSLA members occurs over time.
3. Any benefits to program participation do not occur immediately upon sign-up, but rather accrue over time.

Failure of the first identifying assumption could cause two problems: incomplete sample bias and attrition bias (Karlan 2001). Incomplete sample bias refers to the fact that those who drop out may have been impacted differently than those who remained. By ignoring dropouts in the sample, any benefits of the program could be under- or overestimated, depending on whether the reason for dropping out was success or failure. Attrition bias would result if those who drop out are different from those who remain, irrespective of the program impact. In order to address

potential dropout bias, the study includes a group of dropouts in the treatment group, the size of which is based on the approximate attrition rate experienced in the program. Attrition bias is addressed by controlling for client characteristics, such as age, educational attainment, and number of children at the time of joining the VSLA group.

The second identifying assumption would be violated if selection effects change over time. If the first to join the program are wealthier, more entrepreneurial, or perhaps considered by their peers to be more reliable and trustworthy, program impacts may be overestimated. The less well-situated community members who join later would not provide an accurate "baseline" against which to measure the treatment group. However, the bias caused by changing selection effects over time may also run in the opposite direction – that is, program impact may be underestimated if the poor are the first to join, if, for example, they are willing to take greater risks than their wealthier, more conservative neighbors. To control for changing selection effects, comparisons are made between time invariant characteristics of the treatment and control groups.

The third identifying assumption simply requires that the outcome variables be impacted by participation in the program, rather than just by joining. If new members were able to change the outcome variables in anticipation of future resources, then comparing them to longer-term members may not find any differences. This seems unlikely here because of the liquidity constrained nature of the study population, so this third identifying assumption appears quite reasonable.

In addition to the three major assumptions discussed above, the use of new

members as a control group potentially involves a problem of changing institutional dynamics, which would impact the composition of the new vs. veteran participant pool. The credit or savings program may change its strategy and/or client identification process. Program placement also may change – for example, the programs might prefer to start out cautiously and enter slightly more well-off communities, and then, only once they are successfully established, branch out into poorer neighborhoods. Program placement may also work in the other direction. Any of these changes might affect the relative make-up of the two different groups, thus biasing any comparisons. Karlan (2001) suggests that the best, and perhaps only, way to deal with these problems is through a solid understanding of the selection process involved and the institutional dynamics. From interviews with key informants, including employees of both CARE and JOCDO, it appears that the client identification process has not changed substantially within the past ten years. JOCDO (previously CARE) approaches the leadership of every village in the area to explain the program. The village leader is then responsible for informing his community of the opportunity. If there is a group of 15 to 30 people who are interested in becoming VSLA members, they are encouraged to contact JOCDO. No special effort is made to reach out to any particular subset of the community. Furthermore, as all villages in the area are informed of the program, there is little reason to believe that the nature of the communities involved in the program has changed over time. Though this evidence is unavoidably anecdotal, it suggests that changes in the selection process or institutional dynamics will not bias the results of this study.

(b) Sampling

At the time of the survey, there were 233 VSLA groups in Zanzibar (61 trained by CARE and 172 added since JOCDO took over the organization and training of new groups). However, only groups that were included in the sample used by Anyango et al. (2006) were included in the final sample for this study. This includes the 73 groups that were formed before mid-June 2004. By relying on the sample used in the previous study, it is possible to ensure that only the most "mature" groups are included in the study. This facilitates analysis of the long-term impacts of program participation. The control group is made up of 50 individuals in five new VSLA groups that began training in early January of 2010. The survey took place late in the same month; therefore, these five groups were still only in the very initial stages of the training process and had not begun saving in or borrowing from their new VSLAs.

From the sample of 73 groups, 25 groups spread across 13 different villages were randomly chosen. Four members (with two alternates) were then randomly selected from each of these groups to be interviewed. Although only groups that formed before mid-2004 were included in the sample, within each group, the members were randomly chosen and therefore, the average length of membership was only five years. In addition to the four current members from each group, twenty dropouts were randomly selected from the full set of 25 groups, based on JOCDO's estimated attrition rate of 20 percent, to be interviewed in order to control for potential dropout biases. These dropouts were included with the current participants

in all analyses. In total, 170 current, former, and incipient VSLA members were interviewed.

The questionnaire tool, presented in Appendix A, covered the basic socioeconomic characteristics of the respondents and their households: participation in the VSLA program, asset levels, housing characteristics, nutritional status, access to healthcare, and social impact. In order to facilitate comparisons, where possible, the questionnaire matched that used by Anyango et al. (2006).

Three focus group discussions, each with between 15 and 20 participants, were carried out to supplement the information gathered in the individual survey. The participants for the three groups were randomly selected from the original sample of 73 VSLAs, after excluding the 25 groups that were already included in the quantitative research so as not to recount the information gained through the individual survey. The tool used to organize the focus group discussions is presented in Appendix B. These discussions covered issues such as group formation and membership; general group dynamics; challenges and limitations; behavioral changes; social and economic impact; benefits and/or negative consequences of participation; impact on the community; and the sustainability and effectiveness of the apex organization. In addition, each group was visited during its weekly VSLA meeting, in order to observe the methodology and activities of the group as well as general group dynamics.

(c) Empirical strategy

Simple comparisons of the means across the treatment and the control group allow for initial estimations of program impact. Regression analysis is then used to further explore program impact, while controlling for individual and household characteristics, which might also impact the outcome variables. The basic model used in the regression analysis is as follows,

$$y_i = \beta_1 m_i + \beta_2 g_i + \beta_3 (m_i \cdot g_i) + \mathrm{X}_i \alpha + \epsilon_i$$

where y_i is an outcome of interest; m_i is a binary variable equal to one for long term VSLA members or dropouts and equal to zero for new members; g_i is equal to one for female and zero for male; and X_i represents a vector of control variables, including age, religious status, marital status, number of children, educational status, and prior savings or access to credit. Under the identifying assumptions discussed in Section 3.1, the coefficient β_1 reflects the impact on the outcome variable of VSLA membership on males; β_2 represents the difference in the outcome measure between non-member males and females; and β_3 represents the difference in the impact of VSLA membership on females compared with males.

(d) Data

Initial comparisons of descriptive statistics, presented in Table 1, suggest that the treatment and control groups are similar along most dimensions.[1] Existing VSLA members (the treatment group) are older than newly joining members (the control group) and also have more children, but these differences disappear if we compare age and number of children at the time of joining a VSLA. The only other statistically

significant differences are in educational attainment, and these favor the control group. This difference would be expected to bias the results toward finding the VSLA program to be ineffective since most of the outcome measures are likely to be positively correlated with education.

TABLE 1 HERE

To further address the concern that the first to join the VSLA program might have been better off or more entrepreneurial than those who joined later, Table 2 breaks down the data by subdividing the treatment group by the median number of years of program participation. Again, the basic characteristics of the treatment group do not appear to be statistically different from those of the new members in the control group. Furthermore, there does not appear to be any evidence that the older members of the treatment group—the "pioneers"—are significantly different from more recent members, thus suggesting that the characteristics of VSLA program participants have not changed over time. If anything, newer members appear to be of higher "quality" than older members, in terms of both the education and savings. Therefore, any bias introduced by changes in the characteristics of VSLA participants over time should distort the results toward finding the program to be less effective than it truly is.

TABLE 2 HERE

4. RESULTS

We analyze the impact of VSLA participation on a variety of indicators of household and individual welfare, including the development of income-generating activities (IGAs), asset expenditure levels, quality of housing, educational spending, nutritional status, and health expenditure levels. We first conduct simple mean comparisons of these various outcome measures across the treatment and control groups and then test our findings using regression analysis.

The results in Table 3 show several significant differences in outcomes between the treatment and control groups, all of which indicate a beneficial impact of VSLA membership. Compared with new VSLA members, current members engage in more income-generating activities, spend more on education and health, eat higher quality food (meat and fish) more often, and are more likely to own their own home and to have made improvements in their homes recently.

TABLE 3 HERE

Regression analysis allows us to investigate these correlations further while controlling for the various observable characteristics described in Table 1. Because there were no significant differences between the treatment and control groups in these observable characteristics, the basic results of the regression analysis are similar to those presented in Table 3. The regression analysis also provides a useful way to explore differential program impact by gender, and allows standard errors to be

corrected for possible heteroskedasticity and auto-correlation. The control variables included in each regression are derived from those shown in Table 1 and are related to demographics (age, religion, marital status, number of children), education (non-parametric indicators for level of educational attainment), and financial status (prior savings, prior access to loans).

The regression results for several economic outcomes are presented in Table 4. In this table and those that follow, the program impact on men is given by the coefficient on the "Membership" variable; the impact on women is given by coefficient on the "Membership + (Membership*Gender)" variable; and the difference in impact between men and women is given by the coefficient on "Membership*Gender." The table confirms that there are statistically significant differences between the treatment and control groups for each of the variables presented, and suggests that these differences do not vary significantly between men and women.

TABLE 4 HERE

For each of the variables in Table 4, the magnitude of the impact seems to have practical, as well as statistical, significance. New VSLA members participate in an average of 1.39 income-generating activities. Column (1) suggests that VSLA participation results in an increase of 0.37 income-generating activities for men and 0.52 for women, which is likely to be economically significant for the families involved.[2] Column (2) indicates a significant program impact among members of

members of approximately Tsh100,000. The average annual income in Tanzania is approximately Tsh1,367,300 (US$1,243) (Human Development Report 2009), so this increase represents a substantial 7.7 percent of annual household income. Finally, columns (3) and (4) suggest home ownership and improvement rates increase by 30 and 55 percentage points among VSLA members from a baseline among new members of 60 and 16 percent - clearly meaningful increases.

The regression results for the one education-related outcome variable, level of education expenditures, are presented in Table 5. The basic specification in column (1) shows no impact of the VSLA program on educational expenditures for either men or women. While this differs from the simple mean comparison test shown in Table 3, it should be noted that even that result was only marginally significant and the regression has far fewer degrees of freedom. To explore the robustness of the results for education, a second specification with more degrees of freedom is presented in column (2). There are two differences here from the first column: (1) the four non-Muslims, who had much higher than average educational expenditure, are omitted; and (2) the educational controls were reformulated as a single semi-parametric variable. This specification eliminates some outliers in terms of educational spending and reduces the number of variables in the regression by four (two religion indicators omitted, three education indicators combined to a single variable). Although clearly less robust, the results of this alternative specification are suggestive of a positive program impact on educational spending.

TABLE 5 HERE

This weak result for education outcomes is somewhat surprising given the wealth of literature on the impact of microfinance on education (Littlefield et al. 2003; Neponen 2003; Barnes 2001; Dunn and Arbunkle 2001; Todd 2000). It is possible that educational expenses are not an appropriate proxy for the program's impact on education, especially considering that primary education is provided tuition-free by the Tanzanian government. The weakness of this result is also inconsistent with the results of the focus group discussions. The increased ability to finance the education of their children, including tuition fees, materials, testing fees, etc., was the most commonly cited benefit of program participation by focus group participants. For example, one member took out a loan of Tsh100,000 (US$90) to send her two daughters to a secondary boarding school – an opportunity which would most likely have been closed to them under other circumstances.

The final table of results, Table 6, presents the regressions for health and nutrition outcomes. Column (1) suggests that membership in the VSLA program increases the number of meals per day for male members' households, but not for females'. However, the increase of 0.337 meals per day for male members' households is almost exactly equal to the extra 0.348 meals per day that non-member females' households consume. Thus, it appears that women might already be prioritizing household meals so that there is little room for program participation to have an impact.

TABLE 6 HERE

In addition to meal quantity, VSLA participation seems to have a considerable impact on meal quality, evident in an increase in the quantity of meat and fish consumed in the past week. While the VSLA program participation seems to have no significant impact on meat consumption for the households of male members, Column (2) suggests households of female VSLA members consume meat 0.287 more days per week than non-members. The coefficient on *gender* is negative, though insignificant, implying that control households of female respondents consume meat approximately 0.2 less times than those of male respondents. This runs contrary to previous research suggesting that women are more likely than men to invest in the household's diet. It may be that female-headed households are more resource constrained than male-headed households. This conjecture is supported by the fact that women in control households spend less on household assets, as shown in the second column of Table 4.

Alternatively, given the relatively high price of meat in Zanzibar, women may spend a greater proportion of their resources on more cost-effective food items such as grains or fish. They may be more concerned with meal quantity than quality—a hypothesis supported by the significant and positive coefficient on *gender* in Column (1). Correspondingly, female VSLA members experience a significant program impact on household meat consumption, because they begin to spend more on relatively expensive meat only when participation in a VSLA increases the quantity of available resources.

The regression results presented in Column (3) are also consistent with this

theory and indicate that participation in the VSLA program has a substantial impact on fish consumption. Program participation increases weekly servings of fish by approximately 3.5 for both men and women. This is a very significant increase of a healthy protein source compared to the 1.2 servings per week consumed by the control group.

The final column of Table 6 suggests that the VSLA program had a moderately significant impact on the health expenditures for the households of female members only. This is consistent with the literature that suggests that women are more likely to spend additional resources on the health and welfare of their families than men.

These results for health and nutrition are broadly consistent with the results of the focus group discussions. Many of the focus group participants named nutrition as one of the primary uses of both savings and loans. Several participants also listed improved access to health care as a one of the major benefits to program membership.[3]

5. DISCUSSION

The provision of financial services has expanded rapidly in developing countries over the past decade, but millions of people remain without access. Poor road quality and lower population density makes the provision of formal financial services in rural areas prohibitively expensive. The Village Savings and Loan Association (VSLA) model offers a promising way of increasing financial access in such remote areas. VSLAs are entirely self-sufficient. They require no external

contributions to the loan portfolio and only limited support beyond the initial years. Moreover the results of the study suggest the program has an overall positive impact on various indicators of household and individual welfare, including asset expenditure levels, the development of income-generating activities, spending on education, access to health services, nutritional levels, and quality of housing.

As discussed above, the existing literature suggests that microfinance programs have different impacts for women and men. In particular, programs targeted to women tend to have bigger impacts on measures of household welfare. While this study did not find many statistically significant differences in the impact of VSLAs on households of female and male members, the results are generally consistent with the existing literature. The signs of most of the point estimates are in the expected direction and the lack of statistical significance is likely attributable to low power due to the relatively small sample. Future research on VSLAs that employs a larger sample should help to elucidate the nature and magnitude of differential impact by gender.

The VSLA program may not have as substantial an impact on its members as many of the larger NGO-MFI programs, such as the renowned Grameen Bank in Bangladesh or BancoSol in Bolivia. These organizations have substantial donor resources at their disposal and, therefore, are able to provide much larger loans at slightly lower interest rates, which may facilitate greater impacts. But they are also constrained by the need of more formal infrastructure and are unable to reach more rural areas. Inasmuch as the VSLA approach does not rely on outside donor funding and does not require continued support of the founding organization, it may prove to

be more cost-effective, sustainable, and easily replicated than alternative approaches. Overall, the VSLA model appears to be both successful and sustainable – it is a promising means of improving access for those not otherwise reached by traditional financial services.

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ENDNOTES

[1] Note that the tables in the main text do not show data and results for all of the variables inquired about in the survey. More comprehensive data tables are provided in Appendix C.

[2] Based on the focus group discussions, VSLA loans and savings payouts were used to fund a variety of businesses, including the sale of *khangas* (a traditional piece of fabric worn by many East African women); selling bread, oranges, oil, etc.; transporting oranges to the market; raising ducks and chicken to sell; and selling charcoal and firewood. One participant used a Tsh100,000 (US$90) loan to purchase a used sewing machine and is now one of the most successful tailors in the region. Another member used a loan to purchase a *dhow* (a traditional Swahili fishing boat) and fishing nets, and now runs a small but profitable fishing operation.

[3] One focus group participant attributes her son's life to the VSLA program. As a child, her son was very sick. She was able to take a Tsh100,000 (US$90) loan to bring him to Dar es Salaam where he received treatment that would otherwise have been inaccessible.

APPENDIX A Individual Questionnaire

Statement to be read before the interview begins:
The information provided during this interview will be treated as highly confidential and is collected for research purposes only. Participation in this study will not affect one's membership or role in the VSLA program. The purpose of this study is simply to gain a better understanding of the impacts of the program, so that its efforts may be improved so as to better serve its members. Therefore, we ask you to feel at ease and to provide frank and honest answers without fearing any persecution or disclosure. Researchers are only interested in analysis of collective feed back and not individual respondent information.

Section 1: Background Information

1. **Date of Interview**_____
2. **Village**_____
3. **Name of VSL Group**_____

Section 2: Demographic Information

4. **Gender of client**
   1. Male
   2. Female
5. **Age of client**_____
6. **Relation to HHH**
   1. Household head
   2. Spouse
   3. Son/daughter
   4. Parent of HHH
   5. Other relative
   6. No relation
7. **Religion**
   1. Muslim
   2. Christian
   3. Other
8. **Marital status**
   1. Married
   2. Widowed
   3. Divorced
   4. Separated
   5. Single
9. **If married, is your husband polygamous?**
   1. Yes
   2. No
10. **What is the highest level of schooling that you have reached?**
    1. No education
    2. Primary
    3. Some Secondary (Ordinary level)
    4. Completed secondary (Advanced level)
    5. Higher
11. **How many children have you had?** _____

12. **Provide following details for each member of the household**

No	Sex 1=male 2=female	Age	Marital Status 1 = married 2 = widowed 3 = divorced 4 = separated 5 = single	Relation to HHH 1 = household head 2 = spouse 3 = son/daughter 4 = parent of HHH 5 = other relative 6 = no relation	Main Occupation 1 = younger than school age 2 = student 3 = self-employed farming 4 = employed (no agric.) 5 = agric. laborer 6 = own business 7 = unemployed	Able to Read and Write Swahili 1 = yes 2 = no	Highest level of education 1 = no education 2 = Primary 3 = Some Secondary 4 = Completed Secondary 5 = Higher	Is he/she attending school now? 1 = yes 2 = no
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

13. **How much did your household spend on education expenses (fees, uniforms, books, or other materials) during the last 12 months?**
14. **Do you pay for these educational expenses using payout or loans from the VSLA?**
    1. Yes
    2. No
15. **Does your village have a school?**
    1. Yes
    2. No
16. **Does your village have a paved road?**
    1. Yes
    2. No
17. **How far is it to the closest market in kilometers? _____**

Section 3: Client Information

18. **Member of VSL group for how long**
    1. Less than a year
    2. 1-2 years
    3. 2-5 years
    4. More than 5 years
19. **How many cycles of the VSL have you completed? _____**
20. **How many shares do you currently have in your VSL group? _____**

3.1 Savings

21. **Before you joined the VSLA did you have any savings?**
    1. Yes
    2. No
22. **If yes, where did you put your savings?**
    1. In house
    2. Bank account
    3. Credit union
    4. ROSCA
    5. SACCO
    6. Other
23. **Do you continue to save in any other form?**
    1. In house
    2. Bank account
    3. Credit union
    4. ROSCA
    5. SACCO
    6. Other
    7. Do not save in other form
24. **Amount of last payout? _____**
25. **Please rank your three most important uses of the payout. If business or productive investment, please specify**
    1. Food
    2. Paid off debts
    3. School fees
    4. Family celebration/ceremony
    5. House project/improvements
    6. Savings
    7. Medical expenses/health
    8. Productive investment
    9. Household asset
    10. Gave to spouse
    11. Lending to another
    12. Other

a.Primary use of payout	
If #7, type of productive investment	
b. Secondary use of payout	
If #7, type of productive investment	
c. Tertiary use of payout	
If #7, type of productive investment	

26. **Who made the decision?**
    1. Husband
    2. Wife
    3. Both
    4. Other

3.2 Loans

27. **Did you have access to loans before joining the VSLA?**
    1. Yes
    2. No
28. **If yes, did you ever take out a loan from a different organization?**
    1. Yes
    2. No
29. **If yes, how many loans? _____**
30. **Have you ever taken a loan from VSLA?**
    1. Yes
    2. No
31. **If yes, how many loans? _____**
32. **Did you take out a loan in the previous savings cycle?**
    1. Yes
    2. No
33. **If yes, how many loans did you take during the previous savings cycle? ____**
34. **What was the value of each of the loans during the previous savings cycle?**
    a. Value of First Loan _____
    b. Value of Second Loan_____
    c. Value of Third Loan_____
35. **Please rank your three most important uses of the loan(s). If business or productive investment, please specify**
    1. Food/household expenses
    2. Repaying debts/borrowing for other investment
    3. School fees
    4. Family celebration/ceremony
    5. House improvements
    6. Medical fees/health
    7. Business/productive
    8. Household assets
    9. Emergency
    10. Other

a. Primary Use of Loan	
If #7, type of productive investment	
b. Secondary Use of Loan	
If #7, type of productive investment	
c. Tertiary Use of Loan	
If #7, type of productive investment	

36. **Who made the decision?**
    1. Husband
    2. Wife
    3. Both
    4. Other
37. **Are you currently engaged in any IGA?**
    1. Yes
    2. No
38. **In how many IGA are you currently engaged in? _____**
39. **What type of IGA are you currently engaged in? (circle as many as necessary)**
    1. Agriculture (including livestock-keeping, poultry-farming)
    2. Business (sales and trade)
    3. Fishing
    4. Seaweed Farming
    5. Teaching
    6. Tourist Industry
    7. Transport Industry
    8. Carpentry, masonry
    9. Tailoring
    10. Other, please specify_____
40. **How many people in the household are engaged in work that generates income? _____**

Section 4: Impact on Welfare

Household Assets

41. **How many of the following does your household own?**

#	Type of Asset	Quantity	Were you a member of the VSL when you acquired the asset? 1= yes 2 = no
1	**Livestock**		
1.1	Cows		
1.2	Sheep		

1.3	Goats		
1.4	Chicken/Duck		
2	**Transportation**		
2.1	Car/truck		
2.2	Motorcycle		
2.3	Bicycle		
2.6	Cart		
3	**Electronics**		
3.1	Radio		
3.2	Television		
3.3	Cell phone		
3.4	Fan		
4	**Agricultural Material**		
4.1	Tractor		
4.2	Hoe		
4.3	Plough		
4.4	Irrigation pump		
5	**Other Goods**		
5.1	Mosquito Net		
5.2	Lantern		
5.3	Sewing machine		
5.4	Refrigerator		
5.5	Metal cooking pots		

42. **How much did you spend on household assets, including household goods, equipment, and means of transport, in 2009? _____**
43. **How many acres of land does your family own? _____**
44. **How would you rank your household's wealth within the community?**
    1. Richest in the community
    2. Among the richest in the community
    3. Richer than most households in the community
    4. Among the poorest households in the community
    5. The poorest in the community

Housing

45. **To whom does the house belong?**
    1. Ours
    2. Shared
    3. Rented
    4. Other
46. **Does the house have electricity?**
    1. Yes

2. No

47. **What material are the walls in the house?**
    1. Grass
    2. Mud and Pole
    3. Sun-dried (unburnt) bricks
    4. Baked (burnt) bricks
    5. Cement bricks
    6. Stones
    7. Other
48. **What material is the roof made from?**
    1. Thatch – grass/leaves/mud
    2. Corrugated iron
    3. Asbestos/tiles/concrete
    4. Plastic Sheets
    5. Other
49. **What material is the flood made of?**
    1. Earth, soil
    2. Cement
    3. Tiles
    4. Other
50. **How many rooms for sleeping? _____**
51. **What is your source of water?**
    1. Piped supply
    2. Borehole/covered well
    3. Open well
    4. Spring, river/stream, pond/lake
    5. Other
52. **What type of sanitation does the house use?**
    1. Bush
    2. Traditional pit toilet
    3. Improved pit latrine
    4. Flush Toilet
53. **Source of cooking fuel**
    1. Fuel Wood
    2. Charcoal
    3. Paraffin
    4. Electricity
    5. Bottled Gas
    6. Other
54. **Has your household made any improvements in the past 12 months?**
    1. Yes
    2. No
55. **Where these improvements paid for by payout or loans from the VSLA?**
    1. Yes
    2. No

Household Diet

56. **Has household diet improved since joining the VSLA?**
    1. Improved
    2. Stayed the same
    3. Worsened
    4. I don't know
57. **Usual number of meals per day? _____**
58. **Frequency of problem with satisfying food needs in past year?**
    1. Never
    2. Sometimes
    3. Often

4. Always

59. **Number of days consumed meat in past week? _____**
60. **Number of days consumed fish in past week? _____**

Health Care

61. **Frequency of problem with accessing medical services and medication in past year?**
    1. Never
    2. Sometimes
    3. Often
    4. Always
62. **Are all of your children immunized?**
    1. Yes
    2. No
63. **Do your children sleep under mosquito nets?**
    1. Yes
    2. No
64. **Has the health of members of the household changed since joining the VSLA?**
    1. Improved
    2. Stayed the same
    3. Worsened
    4. I don't know
65. **How much did your household spend on healthcare expenses in 2009? _____**

Section 5: Social Capital

66. **Has your status in the community changed since joining VSLA?**
    1. Improved
    2. Stayed the same
    3. Worsened
    4. I don't know
67. **Has your status in your family changed since joining VSLA?**
    1. Improved
    2. Stayed the same
    3. Worsened
    4. I don't know
68. **Has your self-confidence changed since joining VSLA?**
    1. Improved
    2. Stayed the same
    3. Worsened
    4. I don't know
69. **Are you a member of any community-based organizations, associations, networks or political parties?**
    1. Yes

2. No

70. **If yes, are you a board member or do you hold a leadership position?**
    1. Yes
    2. No

71. **Did you vote in the last parliamentary election?**
    1. Yes
    2. No

72. **In the last 12 months, have you expressed your opinion in a public meeting (other than a VSL regular meeting)?**
    1. Yes
    2. No

APPENDIX B Focus Group Discussion Format

Verbal Consent to Participate in the Focus Group:
You have been asked to participate in a focus group. The purpose of this study is to gain a better understanding of the impacts of the VSL program, so that its efforts may be improved so as to better serve its members. You can choose whether or not to participate in the focus group and may stop at any time. Although the focus group will be tape recorded, your responses will remain anonymous and no names will be mentioned in the report. There are not right or wrong answers to these questions. We want to hear many different viewpoints and would like to hear from everyone. Participation in this study will not affect one's membership or role in the VSLA program. Therefore, we ask you to feel at ease and to provide frank and honest answers without fearing any persecution or disclosure.

1. Tell me a little about your group and how it works
2. How long has the group been in existence?
3. What are some of the challenges and limitations your group faces?
4. Tell me about your life before you joined the group and how has that changed since you became a member of the group?
5. In what ways has your behavior changed since you joined the group?
6. What role do you play in the decision making process of your household? Has it changed since you joined the group?
7. What do you believe the benefits are to belonging to a VSLA group? What are your reasons for joining?
8. Have there been any negative consequences of joining the VSLA group? If so, what are they?
9. How does the community treat VSL members? Do they treat you differently than before you were members?
10. Have you seen an impact of the VSL on the community as a whole?
11. Do you believe that the training has been beneficial? Is the apex organization helpful? Is there any difference between the services that CARE provided versus those that the Apex organization now provides?
12. Is there anything else you would like to say about the VSL program?

APPENDIX C Additional Data Tables

Table C1: Housing Characteristics of Treatment and Control Group

	Treatment Group	Control Group	Test Statistic
n	120	50	
Electricity (%)	28.3	18.0	1.7454*
Source of Drinking Water (%)			
Piped supply	74.0	76.0	0.1948
Well	25.0	24.0	0.1948
Sanitation (%)			
Bush	13.0	4.0	1.6975*
Traditional pit latrine	4.0	54.0	7.5419***
Improved pit latrine	78.0	22.0	6.8484***
Flush toilet	5.0	2.0	3.0316***
Source of Cooking Fuel (%)			
Fuel Wood	98.0	98.0	0.2034
Charcoal	2.0	2.0	0.2034
Flooring Material (%)			
Earth, soil	22.0	34.0	0.7821
Cement	76.0	66.0	0.5562
Tiles	2.0	0	0.9261
Wall Material (%)			
Grass	3.0	4.0	0.5083
Mud and Pole	12.0	26.0	2.2809**
Sun-dried bricks	3.0	10.0	2.0753**
Baked bricks	0	4.0	2.1856**
Stones	59.0	2.0	6.8768***
Cement bricks	23.0	52.0	3.5874***
Other	0	2.0	1.5408
Roof Material (%)			
Thatch	22.0	48.0	3.3656***
Corrugated iron	76.0	52.0	3.1113***
Asbestos, tiles	2.0	0	0.9261
Avg. number of rooms for sleeping	2.566	2.56	0.1230

*** p<0.01, ** p<0.05, * p<0.1

Table C2: Household Assets

	Treatment Group	Control Group	Test Statistic
n	120	50	
Livestock			
Number of cows	1.966387	0.86	1.7678*
Goats	0.7142857	0.46	0.8119
Chicken/Ducks	7.798319	6.54	0.8835
Transportation			
Motorcycles	0.0840336	0.04	0.9336
Bicycles	0.7478992	0.8	0.4248
Electronics			
Radio	0.8833333	0.76	1.0153
Television	0.1092437	0.04	1.4451
Cell Phone	1.033333	0.78	1.708*
Fan	0.0583333	0.04	0.3706
Other household items			
Hoe	0.9916667	1.64	2.6975***
Mosquito net	2.825	2.54	1.235
Lantern	1.441667	1.3	0.5374
Sewing machine	0.302521	0.28	0.2462
Refrigerator	0.0840336	0.02	1.4092
Metal cooking pots	7.525	6.14	1.6302

*** p<0.01, ** p<0.05, * p<0.1

Table C3: Household Food Security

	Treatment Group	Control Group	Test Statistic
Frequency of problems satisfying food needs in past year (%)			
Never	33.0	6.0	3.6760***
Sometimes	66.0	88.0	3.5754***
Often	2.0	6.0	1.5126
Always	0	0	

*** p<0.01, ** p<0.05, * p<0.1

Table C4: Health Status of Household

	Treatment Group	Control Group	Test Statistic
Frequency of problems accessing medical services in past year (%)			
Never	23.0	4.0	3.0327***
Sometimes	69.0	96.0	3.8155***
Often	8.0	0	1.9986**
Always	0	0	
Are all of your children immunized? (%)			
Yes	95.7	95.5	0.0543
Do all of your children sleep under mosquito nets? (%)			
Yes	97.4	90.9	1.7825*

*** p<0.01, ** p<0.05, * p<0.1

Table C5: Income Generating Activities (IGAs)

	Treatment Group	Control Group	Test Statistic
Type of IGA (%)			
Agriculture	75.8	68.0	1.0548
Business	46.7	58.0	1.3466
Fishing	9.2	4.0	1.1550
Seaweed farming	25.0	0.0	3.8960***
Tourism	0.83	0.0	0.6474
Carpentry	0.83	0.0	0.6474
Tailoring	5.8	2.0	1.0754

*** p<0.01, ** p<0.05, * p<0.1

Table C6: Social Status of Respondents

	Treatment Group	Control Group	Test Statistic
Are you a member of any community-based organization, association, or political party? (%)			
Yes	81.5	74.0	1.1000
If yes, do you hold a leadership position (%)			
Yes	28.7	24.3	0.5144
Did you vote in the last parliamentary election? (%)			
Yes	84.9	78.0	1.0818
In the last 12 months have you expressed your opinion in a public meeting? (%)			
Yes	30.2	8.0	3.1063***

*** p<0.01, ** p<0.05, * p<0.1

Table C7: Specifics of VSLA Participation

	Current Members	Drop-Outs	Test Statistic
n	100	20	
Number of years in the VSLA program	5.06	3.25	3.1354***
Amount of last payout (Tsh)	277,125.9	234,473.3	0.9959
Primary uses of payout (%)			
Food	51.0	60.0	0.7358
To pay debts	22.0	15.0	0.7037
School fees	48.0	25.0	1.8909**
Family celebration/ceremony	22.0	25.0	0.2933
House improvement	29.0	30.0	0.0898
Savings	16.0	10.0	0.6860
Medical expenses	10.0	15.0	0.6568
Productive Investment	33.0	30.0	0.2615
Household Assets	6.0	5.0	0.1742
Gave to spouse	1.0	0	0.4491
Other	14.0	10.0	0.4804
Number of loans from VSLA	6.4845	3.375	3.4204***
Average value of loan (Tsh)	120,241.9	111,066.7	0.3072
Primary uses of loan (%)			
Food/household expenses	47.0	45.0	0.1637
To pay debts	18.0	0.0	2.0580**
School fees	35.0	25.0	0.8660
Family celebration/ceremony	18.0	20.0	0.2110
House improvement	22.0	20.0	0.1982
Medical expenses	15.0	20.0	0.5592
Productive Investment	54.0	30.0	1.9596**
Household Assets	6.0	0.0	1.1239
Emergency	5.0	0.0	1.0215
Other	12.0	15.0	0.3703

*** p<0.01, ** p<0.05, * p<0.1

Table C8: Diet and Health Status Changes Since Joining the VSLA Program (Current Members vs. Dropouts)

	Current Members	Drop-out	Test Statistic
Has household diet improved since joining VSLA? (%)			
Improved	75.0	47.4	2.4232***
Stayed the same	23.0	47.4	2.1961**
Worsened	1.0	0.0	0.4377
I don't know	1.0	5.3	1.3252
Has the health of members of the household improved since joining VSLA? (%)			
Improved	80.8	57.9	2.1778**
Stayed the same	18.2	36.8	1.8232*
Worsened	0.0	5.3	2.2924**
I don't know	1.0	0	0.4400

*** p<0.01, ** p<0.05, * p<0.1

Table C9: Changes in Social Status Since Joining the VSLA Program (Current Members vs. Dropouts)

	Current Members	Drop-outs	Test Statistic
Has your status in the community changed since joining? (%)			
Improved	84.0	55.0	2.9152***
Stayed the same	15.0	35.0	2.1101**
Worsened	0.0	0.0	0.0
I don't know	1.0	5.0	1.2756
Has your status in your family changed since joining? (%)			
Improved	85.0	50.0	3.5184***
Stayed the same	15.0	40.0	2.5930***
Worsened	0.0	5.0	2.2454**
I don't know	0.0	0.0	0.0
Has your self-confidence changed since joining? (%)			
Improved	89.0	55.0	3.7245***
Stayed the same	11.0	40.0	3.2431***
Worsened	0.0	0.0	0.0
I don't know	0.0	0.0	0.0

*** p<0.01, ** p<0.05, * p<0.1

Table 1: Demographic Characteristics of Treatment and Control Groups

Control Variable	Treatment Group	Control Group	Test Statistic
N	120	50	
Gender (% Female)	0.68	0.72	0.58
Age	37.95	33.64	2.18**
Age at time of joining	33.19	33.64	0.23
Religion (%)			
Muslim	0.97	1.00	1.31
Christian	0.03	0.00	1.13
Other	0.01	0.00	0.65
Marital status (%)			
Married	0.75	0.70	0.67
Widowed	0.08	0.08	0.07
Divorced	0.05	0.08	0.76
Separated	0.02	0.00	0.92
Single	0.10	0.14	0.75
Educational attainment (%)			
No education	0.13	0.20	1.10
Primary	0.48	0.20	3.34***
Ordinary level	0.16	0.32	2.38**
Advanced level	0.23	0.28	0.64
Number of children	3.73	2.62	2.72***
Number of children at time of joining	3.08	2.62	1.14
Savings prior to joining VSLA? (%)	0.48	0.36	1.38
Access to loans prior to joining? (%)	0.08	0.08	0.11

Notes: Means for the treatment and control groups were compared using t-tests for non-proportions and a proportions test to compare proportions. The reported test statistics are t statistics for non-proportions and z statistics for proportions. Statistically significant results are indicated as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 2: Comparison of Control Variables with Treatment Group Divided by Median Years in VSLA

Control Variable	Means/Percentage			Test Statistic		
	Older	Recent	New	Recent-Older	Recent-New	Older-New
n	63	57	50			
Gender (% Female)	0.71	0.63	0.72	0.97	0.97	0.07
Age	41.03	34.54	33.64	3.20**	0.40	3.37***
Age at time of joining	34.37	31.90	33.64	1.24	0.77	0.33
Religion (%)						
Muslim	0.97	0.96	1.00	0.10	1.34	1.27
Christian	0.03	0.02	0.00	0.50	0.94	1.27
Other	0.00	0.02	0.00	1.06	0.94	0.00
Marital status (%)						
Married	0.75	0.75	0.70	0.11	0.63	0.54
Widowed	0.10	0.07	0.08	0.50	0.19	0.28
Divorced	0.06	0.04	0.08	0.71	1.01	0.34
Separated	0.00	0.04	0.00	1.50	1.34	0.00
Single	0.10	0.11	0.14	0.18	0.55	0.74
Educational attainment (%)						
No education	0.17	0.09	0.20	1.40	1.67	0.34
Primary	0.40	0.56	0.20	1.80*	3.82***	2.25**
Ordinary level	0.17	0.14	0.32	0.51	2.22**	1.80*
Advanced level	0.25	0.21	0.28	0.56	0.84	0.31
Number of children	4.11	3.30	2.62	1.79*	1.49	3.36***
Number of children at time of joining	3.38	2.74	2.62	1.45	0.26	1.71*
Savings prior to joining VSLA? (%)	0.46	0.49	0.36	0.34	1.37	1.07
Access to loans prior to joining? (%)	0.03	0.12	0.08	1.90*	0.73	1.14

Notes: The treatment group was divided into "Older" members and "Recent" members of a VSLA with the dividing line being the median number of years of membership. Means for these two groups and the control group of "New" members were compared pairwise using t-tests for non-proportions and a proportions test to compare proportions. The reported test statistics are t statistics for non-proportions and z statistics for proportions. Statistically significant results are indicated as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3: Economic, Health, and Educational Outcomes of Treatment and Control Group

	Treatment Group	Control Group	Test Statistic
n	120	50	
Number of IGAs	1.91	1.39	4.58***
2009 Asset Expenditure (Tsh)	138,078	31,289	4.73***
Housing Tenure (%)			
Owned by household	0.86	0.60	3.67***
Shared	0.08	0.34	4.22***
Rented	0.01	0.00	0.64
Other	0.05	0.06	0.04
Improvements in last 12 months? (%)	0.67	0.16	6.08***
2009 Education Expenditure (Tsh)	105,580	33,809	1.88*
Average number of meals per day	2.54	2.46	0.93
Average number of days consumed meat in last week	0.50	0.16	2.64***
Average number of days consumed fish in last week	4.61	1.20	10.38***
2009 Health Expenditures (Tsh)	69,521	36,948	2.17**

Notes: Means for the treatment and control groups were compared using t-tests for non-proportions and a proportions test to compare proportions. The reported test statistics are thus t statistics for non-proportions and z statistics for proportions. Statistically significant results are indicated as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table 4: Economic Outcomes

	(1)	(2)	(3)	(4)
	# of IGAs	2009 Asset Expenditure	Home Ownership	Housing Improvements
Membership	0.368*	116,000***	1.000**	1.582***
	(0.205)	(40,500)	(0.430)	(0.509)
Marginal effect			0.301**	0.552***
			(0.139)	(0.130)
Gender	0.044	-21,200*	0.389	-0.440
	(0.086)	(11,355)	(0.382)	(0.421)
Marginal effect			0.107	-0.173
			(0.112)	(0.161)
Membership*Gender	0.157	-29,100	0.008	0.096
	(0.237)	(48,900)	(0.495)	(0.484)
Marginal effect			0.002	0.038
			(0.128)	(0.193)
Membership + (Membership*Gender)	0.524***	87,200***	1.008***	1.678***
	(0.097)	(26,700)	(0.265)	(0.301)
Marginal effect			0.304***	0.576***
			(0.082)	(0.072)
Demographic controls	Yes	Yes	Yes	Yes
Education controls	Yes	Yes	Yes	Yes
Financial controls	Yes	Yes	Yes	Yes
Constant	0.913***	-400	0.693	0.056
	(0.304)	(55,500)	(0.787)	(0.576)
Observations	162	133	170	170
R-squared / Pseudo-R-squared	0.211	0.274	0.130	0.224

Notes: The table reports the results of regressions. The column labels indicate the dependent variable while rows indicate explanatory variables. See the text for a complete description of the control variables. Columns (1) and (2) were estimated using OLS regression while columns (3) and (4) report the results of probit regressions. Standard errors are in parentheses and are heteroskedasticity robust and clustered by VSLA group (n = 25). Statistically significant results are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Education Outcome

	(1) 2009 Education Expenditures	(2) 2009 Education Expenditures
Membership	-19,400	29,900**
	(41,000)	(14,300)
Gender	-42,100	-23,900
	(33,000)	(36,400)
Membership*Gender	46,300	28,000
	(54,600)	(64,100)
Membership + (Membership*Gender)	26,900	39,000**
	(20,600)	(16,800)
Demographic controls	Yes	Yes
Education controls	Yes	Non-parametric
Financial controls	Yes	Yes
Constant	-130,000	-118,000
	(95,800)	(90,600)
Observations	164	160
R-squared	0.294	0.128

Notes: The table reports the results of regressions. The column labels indicate the dependent variable while rows indicate explanatory variables. See the text for a complete description of the control variables. All columns were estimated using OLS regression. Standard errors are in parentheses and are heteroskedasticity robust and clustered by VSLA group (n = 25). Statistically significant results are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Health and Nutrition Outcomes

	(1) # of meals per day	(2) # of times had meat	(3) # of times had fish	(4) 2009 Health Expenditures
Membership	0.337**	0.337	3.48***	28,000
	(0.151)	(0.311)	(0.743)	(29,800)
Gender	0.348***	-0.209	-0.762	-23,500
	(0.111)	(0.272)	(0.765)	(15,500)
Membership*Gender	-0.358**	-0.0494	0.208	-7,110
	(0.149)	(0.355)	(0.814)	(33,700)
Membership + (Membership*Gender)	-0.020	0.287*	3.69***	20,900*
	(0.106)	(0.144)	(0.341)	(11,900)
Demographic controls	Yes	Yes	Yes	Yes
Education controls	Yes	Yes	Yes	Yes
Financial controls	Yes	Yes	Yes	Yes
Constant	2.04***	0.580	0.876	1,440
	(0.226)	(0.396)	(0.867)	(29,400)
Observations	170	168	168	160
R-squared	0.133	0.137	0.491	0.145

Notes: The table reports the results of regressions. The column labels indicate the dependent variable while rows indicate explanatory variables. See the text for a complete description of the control variables. All columns were estimated using OLS regression. Standard errors are in parentheses and are heteroskedasticity robust and clustered by VSLA group (n = 25). Statistically significant results are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.