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The Impact of Village Savings and Loan Associations (VSLAs) on South Sudanese Refugees and Ugandan Citizens in Northern Uganda

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I. Introduction

South Sudan has been a place of conflict between two tribes, Dinka and Nuer, since 2013. The conflict has continued as the two tribes fight for power. The conflict began as the President, Salva Kiir, removed the vice president, Riek Machar, as Vice President. Those of Dinka ethnicity sided with President Kiir and those in the Nuer tribe sided with the vice president. Violence in South Sudan prevented farmers from harvesting food and led to the worst food crisis in the world. The civil war in South Sudan also led to killings based on ethnicity (CRF 2018).

As a result, many South Sudanese citizens have fled due to food insecurity and fear of imminent attack. Since the conflict in 2013, there has been a total of 1,963,014 who are registered or are awaiting registration to become refugees. In Uganda specifically, there are 1,015, 415 refugees (UNHCR, 2018). Refugee settlements in Uganda are concentrated in Moyo, Yumbe and Adjumani.

Refugees face many economic challenges even after safely fleeting conflict. Many refugees are in what Kaiser (2005) calls “protracted refugee situations” because they are likely to stay in refugee settlements for more than five years, with no prospect solution to the South Sudanese conflict. Refugees also face challenges common to the poor such as low income, the unpredictability of income, and irregularity; these three themes they face have been nicknamed the "triple whammy" (Collins et.al, 2009). Some challenges, however, are unique to refugees.

In Uganda, South Sudanese refugees can integrate into the economy due to the open refugee policy but do not have complete freedom of movement. In fact, refugees need to be registered in settlements (Kaiser 2015). In Ugandan camps in Moyo, Adjumani, and Yumbe, the South Sudanese refugees receive a 30-by-30-meter plot of land, a tarp, meal rations for a year and blankets. However, because they have been relocated, refugees have limited capability to build new business enterprises and accumulate assets needed to ensure themselves against uncertainty. Because of this, microfinance institutions can help refugees by providing access to savings and loans.

Community-based microfinance programs can be impactful in conflict areas; however, there may be specific challenges operating in a refugee setting. One issue in these settings is the lack of trust that occurs between organizational leaders and refugees. Since refugee camps aren’t permanent, another barrier with the refugee status is the possibility that refugees will leave settlement before the end of the microfinance cycle (Travis 2014).

One popular model of microfinance is Village Savings and Loans Associations (VSLA). VSLAs give poor refugee populations access to savings and credit. Without these, many vulnerable populations have little to no access to money for major expenses such as investing in businesses or financing unexpected events or emergencies. VSLAs are savings-led microfinance groups that contain from 15 to 30 people. These groups are self-managed by members of the group and

provide a safe place for saving. Members can loan out money from the group's savings and can pay the groups back with an interest rate determined by the group in its inception. These loans can be used for unexpected emergency situations or for business expansion reasons (CARE, 2016). What makes VSLAs unique and attractive in the poorer areas in the world, is that they are entirely self-sufficient and require no external borrowing or donations and do not need to be registered with the government, creating a more user-friendly form of saving and borrowing (Brannen, 2010).

A. Objective

The purpose of this research is to determine the impact of participation in VSLAs on South Sudanese refugees. As of now, there is little research on the impact of savings in Sub-Saharan Africa. There is also no research that focuses on the VSLAs on refugees. This research will make several contributions to the literature. First, it will add to the sparse literature on the effectiveness of savings on a household's ability to accumulate assets. Second, it will contribute to the literature on the effectiveness of microfinance effectiveness on refugees.

A common issue with measuring the impact of VSLA is that they often simply replace existing methods of savings or insurance. For example, without formal savings, neighbors can smooth consumption in response to adult illness by borrowing from each other. Thus, simply because we observe people saving when they join a group, it does not necessarily mean that they are better off than if they had to rely on traditional social safety nets. However, refugees provide an interesting group to study. Because they have moved, they do not have traditional social networks they can rely on in emergencies. Thus, we expect programs like VSLAs to be potentially more impactful than they would otherwise.

To study the effect of VLSAs on refugee households, we are collaborating with Seed Effect. Seed Effect is a non-profit organization that offers economic empowerment to South Sudanese refugees in Uganda by establishing VSLAs throughout refugee communities. To help them assess the impact of their new program, Seed Effect has asked us to analyze this data. Seed Effect administers all the surveys and gathers data through a household-based survey of participants called a Social Survey. The main goal of the survey is to assess the impact of savings and loans in the overall quality of life of the participant.

II. Background

The financial decisions of the poor are complicated. The poor can make decisions on how to afford necessities based on small amounts of money. Income of the poor can come in diverse and inconsistent ways. Rural and semi-urban regions include a large number of entrepreneurs in their populations; whose income can vary by season, political changes, etc. These entrepreneurs lack finances to expand their businesses in order to be more profitable in the future. Without formal financial institutions or access to savings and/or credit, such as banks, there may be no way to expand their business. During times of struggle, such as adverse health, these entrepreneurs may sell profitable assets in order to cover costs for a given struggle. In situations where neither microfinance systems nor formal institutions are available, the poor may tend to borrow from their community or family members when in need of money. Informal loans in these situations tend to carry no interest rates, therefore there is no benefit to those loaning out. Microfinance has

become a way for many of the poor in these regions to access services such as credit, savings and insurance. However, even some forms of microfinance interventions tend to fail by not properly serving the needs of the poor in a given region.

This chapter introduces issues within formal and informal financial institutions in poor regions of the world. Also, the chapter presents an overview of the start to microfinance systems and how these systems have developed throughout time. Lastly, it will explain a specific microfinance system, called Village Loans and Savings Associations, and will introduce why this form can benefit the poor in getting savings, credit and insurance.

A. Formal Financial Institutions and the Poor

Formal banks in poor regions struggle to properly serve poor citizens all over the world. One reason banks struggle to provide service to the poor is that the transaction costs are high. More transactions need to occur from the poorer citizens in order to cover the same costs incurred by one large transaction in more developed countries. Also, the risk needed to provide banking services is high when dealing with poorer borrowers. (Armendáriz and Morduch 2010).

There are two reasons why it may be difficult for lenders to properly charge interest rates and account for true risk. The first marked failure is called ‘adverse selection’; this occurs when lenders cannot distinguish who is a risky borrower and who is a safe borrower (Armendáriz and Morduch 2010). The lack of collateral and irregular income of the poor make them riskier customers for financial institutions. Since the bank has no collateral or any good that a borrower can exchange in case of an unpaid loan, lenders may charge high-interest rates to every borrower in case there is a possibility of a risky borrower. This can create issues when those who are not risky borrowers borrow less than they could with a lower interest rate.

The second reason is ‘moral hazard’, which is when a borrower reduces his or her effort and thus the business is more likely to fail to lead to a worse repayment rate. This occurs once the loan has been given. Higher interest rates can exacerbate this moral hazard (Armendáriz and Morduch 2010). High-interest rates tend to be higher than the borrower's marginal profit from a given loan, meaning that taking on a loan ends up becoming a loss for the borrower.

Historically, many governments of poor countries become involved in the decision process of banks. Some poor countries will put a maximum amount of interest rate a bank can charge (Armendáriz and Morduch 2010). This means that if a loan is used to pay for an investment and profit is made, this profit will be, on average, less than the cost to repay the loan with interest. However, in times of high inflation, this limit puts banks at a disadvantage as the interest can become negative, making loan-giving a losing business. Also, governments can subsidize banks to cover for the loss. Even this can cause issues because not every poor person can have access to these subsidies; it is usually selected groups (Armendáriz and Morduch 2010). All these barriers to banks can help make informal lending more attractive. The poor may prefer to borrow from family, friends or moneylenders

B. Informal Financial Institutions

Poor communities have been finding ways to save informally, to avoid the barriers and issues caused by formal financial institutions and informal lending institutions. Rotating Savings and

Credit Association (ROSCAs), for example, occur between a group of 15 to 30 people. All members save an agreed amount every week and the fund is distributed to each member in rotation. In the end, each member has received a loan (Brannen, 2010). ROSCAs are attractive, especially among women, because they can put their money in a place away from their homes, where their husbands can control the use of money (Armendáriz and Morduch 2010). A downside to the ROSCAs is how no interest is accrued within the savings. Also, ROSCAs tend to not be flexible in the size of the contribution and everyone in the group must borrow. Yet, ROSCAs have set a precedent in how microfinance can function within a community setting.

Accumulating Savings and Credit Associations (ASCAs) are also credit cooperatives, meaning members do not have to wait their turn to borrow (Armendáriz and Morduch 2010). These are similar to ROSCAs. Members can, but are not required to, loan out part of the savings and the loans can be repaid with interest. ASCAs also have limitations; they are complicated to run and in order to borrow, members must directly participate in the operations process. Village Savings and Loan Associations (VSLAs) are similar in that they work to overcome ROSCAs and ASCAs' weaknesses.

Another form of informal financial institutions, money lending, is very popular in places where banks are not accessible. However, moneylenders are infamous for charging high-interest rates (Armendáriz and Morduch 2010). Another issue with money lending is how in an environment where the moneylender is a monopoly, he/she may hold loans back in order to maximize profit, putting a limit on quantity regardless of demand. Also, a lack of regulation can lead to discrimination by money lenders, which will not stop. One may put a limit on loans based on sex, gender, religion, etc. This act of holding back service regardless of demand goes against economic principle.

A common problem with financial agencies is that there is tension between a principal (e.g. Lender) and an agent (e.g. Borrower) due to adverse selection and moral hazard (Armendáriz and Morduch 2010). The result is that even when there is access to banks there may be very high-interest rates charged in any given loan. There are various forms of informal financial institutions but they tend to not be the most efficient way for the poor to borrow or save.

C. Traditional Microfinance

One of the first and most famous examples of microfinance occurred in Bangladesh's Grameen Bank during the 1970s. Muhammad Yunus established a set of loans through the Grameen Bank; he later introduced the idea of group lending. Yunus built on the ROSCA model that was popular within poor communities. Lending in the form of group liability allowed for poor borrowers to be responsible for other group members in regard to their loans, decreasing the moral hazard discussed in the previous section. This group dynamic was beneficial, in theory, because it encouraged people to pay back their loans due to a sense of social standing. Yet, in many cases, this group dynamic failed to increase the rate of borrowers paid back to full (Karlan & Appel, 2011).

Even when loans are paid back with a group, it may not be from the original borrower. People from an individual group may pick up their group member's slack in order to repay the group's debt (Karlan & Appel, 2011). Another issue with group lending is the repayment meetings in the

banks; which can take hours. This can be the time that the participant could be running his or her business. It is also expected for repayments to start within a week or a month; this is unrealistic since growth to business through investment does not occur that quickly investment (Armendáriz and Morduch, 2010). In addition, there are limits on how borrowers can use their money. At the Grameen Bank, people could only borrow for entrepreneurial expenses; this may not be most useful to the participant because he or she may need to use loans to pay for emergencies such as sickness (Karlan & Appel, 2011). This lack of flexibility has led to the creation of more developed microfinance programs that can provide more flexibility and a group dynamic. It also does not account for the fungibility of money; this is the ability for money to be interchangeable. So, not only is this limit on loan use not flexible, but also unrealistic.

Since microfinance initiatives were introduced in the 1970s, many organizations provided microcredit, which focuses on small loans. Microcredit differs from microfinance in that it does not include savings and insurance. Various organizations that provided microcredit, such as the Grameen Bank, require outside investment. Without access to savings, however, borrowers can remain dependent on the outside investment (Armendáriz and Morduch, 2010). Economists who study microfinance have focused their efforts on finding the most effective way to provide savings, credit and insurance. A program that can offer these three factors is the Village Savings and Loan Associations (VSLAs). VSLAs also offer a high degree of flexibility that the Grameen Bank did not.

D. Village Savings and Loan Associations (VSLAs)

VSLAs are a common form of microfinance in poor areas of Africa. These were set up by CARE (Cooperative for Assistance and Relief Everywhere) in Niger during 1991. VSLAs focused on the group dynamic that ROSCAs included and focuses on savings. VSLAs offer savings, credit and insurance and give participants full control over their finances (CARE, 2016). This form of microfinance is popular, especially in Sub-Saharan Africa. In fact, CARE had around 6,699,000 members; 62% in Africa (CARE, 2017). No external borrowing is necessary through VSLAs; in fact, participants in this type of microfinance become their own bankers. VSLAs work through the use of a 15 to 30-member group. Out of the 15 to 30 participants, there are various leadership positions such as the box holder and various key holders. These positions are necessary to keep the box, where the cash is held, safe from access to non-members.

At the beginning of the VSLA cycle, which usually lasts around a year, the group can determine the amount of money in each share, the interest rate, the amount to be allotted to the social fund, education fund and the penalty amount. The social fund is the form of insurance in case a member might have an emergency. Similarly, the education fund is what covers the cost of materials necessary for VSLAs, such as notebooks (CARE, 2016). Various organizations that offer VSLAs may fund the initial cost of materials so no education fund is necessary.

The original CARE structure allowed for participants to save one to three shares, but now, various organizations offer a different number of maximum shares (CARE, 2016). For example, Seed Effect, based in Uganda, offers the ability to save up to five shares. Once enough shares have been saved, group members may begin to give out loans. Each member has an equal ability to take out a loan, however, one may only take up to three times the value of the number of shares this participant has saved. When loans are paid back, they include a group-agreed interest

rate. At the end of the VSLA cycle, the amount accrued in interest is divided by the number of shares per participant. Also, people can borrow and save through their individual liability and group liability. This occurs because if a loan is unpaid, the individual will pay it with their savings first and then the outstanding amount will be paid using the general group fund (CARE, 2016).

Organizations, such as CARE and Seed Effect, who establish VSLAs, act as "umbrella organizations" because they provide materials, such as boxes to hold savings, supervise the VSLA groups, collect data, and provide different types of training, such as financial and for skills (CARE, 2016). Initially, field officers in organizations go out to form VSLAs in various surrounding areas. Once the VSLAs have been set up, field officers find "village agents" within the savings groups. These village agents show passion for the cause and are knowledgeable in the process; they can go out and start forming their own VSLAs. This structure has allowed VSLAs to spread rapidly all over the world.

VSLAs have become popular in many parts of the world, especially in Sub-Saharan Africa. This type of microfinance can serve the poor in Africa without access to financial institutions. Compared to other types of microfinance, VSLAs are sustainable within the community they are set up in. There is no outside investment necessary to continue VSLAs, especially since all money saved and loaned out is fully contributed by the members of the group. Also, the interest rates predetermined by the group for loans protect the group's savings from high inflation rates in developing nations.

E. Summary

Many poor entrepreneurs all over the world lack access to formal financial institutions. Without these institutions, these entrepreneurs do not have a place to save or borrow. Without access to any of these, entrepreneurs encounter more boundaries when trying to grow their business and increase profits. Even when they have access to institutions that offer loans, the interest rates charged may be more than the marginal profit gained from the loans. Because of this, the poor may choose informal ways to save and borrow, such as money lending, which also is infamous for high-interest rates.

Microfinance has become popularized in poor areas because it may provide a place to save, borrow and receive insurance. A well-designed microfinance program can offer all three. Even within microfinance, there are many flawed programs that can make participants dependent on outside investors. Community-based microfinance programs, such as VSLAs, account for various of the flaws mentioned above.

III. Literature Review

Microfinance has been developing since it was popularized when Muhammad Yunus introduced the Grameen Bank program. This chapter will analyze past literature to show how microfinance has developed throughout the years in order to have more long-term effects on participants. This section will discuss programs with microcredit-only, then discuss those with micro savings-only programs, and will conclude with literature that includes micro savings and microcredit, especially those studies that include Village Savings and Loan Associations.

A. Microcredit

Microcredit has been implemented in various countries in the world since the inception of microfinance. The Grameen Bank introduced a formal microcredit institution in the form of group lending. It is estimated that 155 million people were served by thousands of microfinance institutions in 2011 (Karlan and Appel). Yet, those microfinance programs with only microcredit opportunities have not shown the most effective and long-term results for participants.

What made the Grameen Bank unique was its focus on group liability and included what made ROSCAs and other informal methods of financial services attractive. group liability, also known as social collateral, is the main mechanism in making sure there is repayment of unsecured loans. However, it also lacked positive results in the borrowers' lives (Collins et al., 2009). A study by Xavier Giné and Dean Karlan (2006) compared the effects of group liability and individual liability. The study looked at a program in the Grameen Bank of Caraga, Philippines, where they randomly selected a third of communities to get loans on group-liability, a third to get loans under individual-liability, and a third to get the first loan under group liability and the later ones on individual liability. The study found that the operational benefits of group lending did not differ from those of individual lending. This means that the impacts were similar. However, the study did find that those with individual liability were more attractive and had fewer dropouts. This occurred because it is less of a burden for participants to focus on their own loans than having to worry about others' loans.

When the Grameen Bank introduced its form of microcredit, participants could only use their loans for business expenses (Karlan and Appel, 2011). Many microfinance programs have adopted this form of microcredit and only loan for business-related activities. This, however, may not be the most useful way for people to use loans in times of need. A study in Sri Lanka tested what participants used a given grant (Mel et al., 2008). Although this study focuses on grants rather than loans, it emphasizes how people use money when there is an increase in income. The random sample included microenterprises made up of half men and half women. Half of the random sample was given a grant to spend on business related items and half were given cash with no strings attached. Interestingly, those who had the option to spend a grant in anything used about 42% of it in non-business expenses such as food and medicine. These results devalue the importance of limiting what loans or other increases in income can be used for. The lack of flexibility may not be the most beneficial for those participating in microfinance programs.

Frequent repayment installments, within the Grameen model, may also be an issue to participants. Lenders tend to expect loans to be paid through installments within two weeks of the loan (Field and Pande, 2008). Microfinance institutions tend to use default rates when there are missed payments; this is to a threat to the sustainability of the program, as it hides delinquencies (Silwal, 2003). A study in India looks at how repayment schedules affect default and delinquency. Microfinance groups were randomly assigned to a weekly repayment schedule or a monthly repayment schedule (Fields and Pandas, 2008). The results show no effects in the installment strategy on repayments. The authors suggest having less frequent repayment methods as this leads to lower costs for the lender. Armendáriz and Morduch (2010) also point out frequent repayment put season workers at a disadvantage.

Although many of the specific aspects of microcredit-only programs have not been as successful as expected, it is also important to test the overall success of microcredit institutions. To do this, studies look at the return on loans given to see the quantitative impact these programs can have on participants. Karlan and Zinman (2009) designed a study in Manila that randomized participants accepted into a microfinance program and assessed the impacts of credit. The sample included applicants approved and the control group included rejected applicants. Through the loan, it appears that business increased profits. However, this occurred due to shrinking firms and decreasing costs in comparison to the control group. Costs fell due to smaller businesses, therefore increasing overall profit. These results show that there are limited positive effects that come from microcredit-only institutions. A decrease in the business size will only show short-term benefits, however, in the long run, profit will be less.

These financial effects can differ by gender. Mel et al (2009) found that men benefit more than women because they tend to have positive returns on a loan, while women tend to have negative returns. Karlan and Zinman (2009) also saw a benefit in male entrepreneurs but not women entrepreneurs. Men benefiting more than may be an issue because women often rely on microfinance programs to deal with household expenditures (Brannen, 2010).

For years, microcredit was the main component of microfinance. Evidence shows that microcredit alone has many issues that need to be addressed. The main issue is the lack of flexibility, savings and insurance. Further research shows an increase in the blend of micro-savings and microcredit within the infrastructure of the program.

B. Savings

In their review of the literature on microfinance in sub-Saharan Africa, Van Rooyen, Stewart and De Wet (2012) note that there are only a handful of high-quality studies that examine the role of savings. One reason is that saving-only programs are also uncommon since many microfinance programs focus on either microcredit only or micro savings and microcredit used hand in hand.

Savings are demanded by the poor, even those with no access to banks. In *Portfolios of the Poor* attempts to answer the question of how people can live on $2 dollars or less a day. Even the poor need financial services because their financial transactions are sophisticated. In fact, saving services are important to the poorest people due to the low income, irregularity and unpredictability, and lack of tools, which the authors nickname the "triple whammy." In their study, the authors gathered financial information and decisions of 250 people. The financial diaries showed indicators that the poor welcome the change to save regularly over time (Collins et al., 2009; Prina, 2015). Current underserving in this area occurs due to the absence of institutionalized structures that facilitate saving (Steinert et al., 2018). Therefore, it’s the lack of demand, not supply, that acts as a barrier to saving.

C. Impacts of Micro Saving Programs

Microfinance programs aim at increasing financial assets, education, financial literacy, bettering health, etc. Past studies have found positive outcomes from micro savings programs. Pascaline Dupas and Jonathan Robinson conducted a study in which they looked at a group of entrepreneurs and how their income and expenditures changed after opening a savings account

with a Kenyan local cooperative. The sample included people who did not already have a savings account and had no access to a bank. In total, the sample included 392 people: women and men vendors, and men bicycle taxi drivers. The sample was randomly divided into treatment and control group. Participants in the treatment group had the opportunity to open a village bank account at no cost. Not surprisingly, women participants with the savings account increased investments in their businesses by 40%; there were no effects on men. Yet, no evidence shows that the increase in investment led to an increase in profits (Dupas & Robinson, 2013).

Similarly, Brune et al. (2015) looked at the impacts of savings in Malawi and found results showing increases in business investments. The study focused on looking at the impact of facilitated savings in formal bank accounts. The sample included members from "farmers clubs" set up by the Opportunity Bank of Malawi. These clubs exist as a form of group liability for loans. Farmer clubs were randomly assigned into a control group with no access to savings, a group with the option to save and included assistance in setting up and a commitment savings group that included savings accounts and commitment features. Within agricultural clients, the study concluded that out of the participants offered a savings account or offered a simple bank account, there was an increase of land cultivated by 0.30 acres (Brune et al., 2015). Unlike the study by Dupas and Robinson, Brune et al. (2015) found an increase in profits through increased yields due to an increase in land area.

Not only do micro savings programs increase business investment, but they also increase awareness for savings within the poor, which keeps demand for saving high even after the program is over. A year after the study ended, those who had a savings account were more likely to own a fixed-deposit account (Brune et al., 2015).

Micro-savings' effects are not limited to improvements within the participant's business. An increase in household expenditures are also common (Dupas & Robinson, 2013; Brune et al., 2015). Steinert et al. (2018) conducted a meta-analysis of 27 studies that focused on saving programs within Sub-Saharan Africa. The authors rated studies using the Cochrane Risk of Bias Assessment Tool for Randomized Controlled Trials. The result of this rating system found that only 24 studies, with a total of 87,025 participants, met their quality criteria. These 24 studies were separated into formal and informal microfinance programs. The results indicated an increase in household expenditures, showing formal programs were more effective than informal programs. This increase in expenditures can be explained by an increase in income for the participants at the end of the various programs.

Those with access to savings can be impacted by more than just financially, their health and food consumption can be impacted as well. In the Dupas & Robinson 2003 study, participants who had a savings account were able to afford treatment right away and did not have to reduce working hours, unlike those without savings. Also, food quality and security are seen to increase and education payments are performed more often due to savings (Dupas & Robinson, 2013; Ssewamala et al., 2010; Steinert et al., 2018).

Taken together, these studies show how savings can be used for various purposes, not only for businesses. This is important as the poor may have to deal with different kinds of shocks that can be alleviated by saved money.

D. Micro Savings and Microcredit

Microfinance programs that include both a savings and loan component can be beneficial to those who may need to borrow, have a health shock, or want to invest more than they have saved. As mentioned in Chapter 2, VSLAs have overcome weaknesses that informal methods such as ROSCAs, and ASCAs have. Compared to savings-only or credit-only microfinance programs, VSLAs and other savings and credit programs have more positive effects for the participants.

Savings and credit microfinance programs have financial benefits. In their experiment, Barnes et. al (2001) analyzed the effects of FICNA, FOCCAS and PRIDE programs in Uganda. These programs include a saving and credit during group meetings. To measure results, the researchers looked at two rounds of surveys sent out participants and data trends. The control group included non-members of these programs. The treatment group was randomly selected within the programs. Because the experimental group was not random, the researchers take into account initial differences; yet, self-selection bias exists. An ANOVA test was used to measure variance. Agricultural investments in Uganda showed an increase in business income due to investments, in fact, those in the control group tended to lose profit more often than members. This increase in business income is a unique effect not seen in saving-only research.

Programs that look at VSLAs specifically have positive effects on business investment and income. Brannen's (2010) study of 170 households in Zanzibar, Tanzania shows an increase of business investment from participation in VSLAs. This study looked at existent VSLA groups and used the newly formed VSLA groups as control, suggesting that more mature groups would have more effects due to the longer access to savings and credit. In addition to this study, an experimental cluster randomized trial looked at VSLA specifically; twenty-three villages were used as the treatment group and received access to VSLAs. The other twenty-three were used as a control group and received no access, until two years later out (Ksoll et al., 2016). This study finds that most share-outs were used for agricultural investments such as seeds and fertilizer. Also, the number of businesses in treatment villages was higher post study and the average business income increased by as much as the size of the share-out.

Also, studies find that there is an increase in household welfare at the VSLAs cycle, which usually lasts about a year. The increase in household welfare also leads to an increase in house investments. Ksoll et al. (2016) found an increase in the size of dwelling within the treatment group. Similarly, Brannen (2010) found an increase in house improvements and home ownership. This increase in size or ownership of housing suggests an increase in household welfare.

There are also various non-financial benefits seen in participants of VSLAs. In terms of health, participants tend to invest more in preventative healthcare practices and health treatment services. For example, there was an increase in protective behaviors through the use of mosquito nets in Tanzania, as well as an increase in healthcare received (Brannen, 2010). Ugandan participants in Barnes' study (2001) increased expenditures in medicine.

Food security increases and food quality becomes better as well. In fact, the number of meals consumed per day increased in Malawi (Ksoll et al., 2016). Barnes (2001) saw an increase in

expenditures for food. Not only does food security increase but also food quality. Brannen (2010) found that female VSLA members increased meat consumption and all members consumed more fish than non-members. Literature states that women tend to invest in food quantity over quality. Since meat and fish consumption increased, then this suggests participants were more food secure and had remaining wealth to spend.

In addition, findings suggest more participant investment in education expenditures. Brannen (2010) found that the treatment group spends more significantly on education; which may be due to an investment in higher quality education or education for more dependents.

Interestingly, through focus groups and survey comments, studies also found that there was a higher sense of community after participation in microfinance programs. Brannen (2010) found that participants had a stronger sense of self-confidence as part of a community and a stronger sense of community after joining a VSLA. In Uganda, participants stated that social networks were stronger after joining the microfinance initiatives.

The literature on microfinance initiatives with both a savings and borrowing component has a variety of positive effects on participants. Most clear, are the impacts on business investments, income and expenditures. Some studies also found an increase in health, food and education expenditures. Participants also show an appreciation for the sense of community created through microfinance initiatives.

IV. Data

This study looks at the effect of VSLAs on refugee households and Ugandan host households. This is possible through a collaboration with Seed Effect, a non-profit organization that offers economic empowerment to South Sudanese refugees and Ugandan citizens in Uganda by establishing VSLAs throughout refugee and host communities. Seed Effect has Ugandan and South Sudanese employees who administer the surveys and train the participants on the technicalities of VSLAs.

A. VSLA Design

VSLAs through Seed Effect operate for one year. Seed Effect staff meets with a village or settlement leader and that leader helps set up a meeting with the community members. The community leader is responsible for generating interested parties. Seed Effect staff holds two meetings for those interested where they explain the goals and logistics of the program. Then, groups are formed based on trust and self-selection within each community. This self-selection lowers the market failure of adverse selection as people tend to choose to be in groups with people who are likely to pay back. Once formed, the group decides who the leaders will be. There are various leadership positions within the group. The chairperson leads the meetings, is there in case of conflict and to maintain discipline. The record keeper writes down all transactions for the social fund, savings and borrowing. The box keeper keeps the box with money safe. Three key holders keep one key each; all three keys are needed to open the box. Also, two money counters count money in all transactions and communicate with the record keeper.

Each VSLA group meets weekly. During the first meeting, either a village agent or village officer will lead the meeting as the chairperson is trained. The specific VSLA group has time to write a constitution in which they will determine the value of the weekly social fund payment, the value of each share, the amount in penalties if a participant cannot pay both of these, and the interest rate on loans. Also, the group creates a loan priority list as a foundation for declining a loan that may not have an acceptable purpose or to settle who gets the loan if there are more requests than available funds in the box. The priority list is written in the constitution. A group may give first priority to mothers with more than five kids, or to the eldest members.

At the beginning of each weekly meeting, the group sits in the order of how the names are listed in the record keeper's notebook. The chairperson introduces the meeting and begins with a prayer and bible study. Once this is finished, the record keeper reads the total amount of money in the social fund and what is in the box currently. Each member is expected to pay the agreed amount for the social fund. After this, the record keeper calls each name again, and members can pay from one to five shares into their savings. During their fourth meeting, anyone in the group who has saved money is allowed to borrow. Participants are allowed to borrow up to three times the amount they have saved. The opportunity to borrow does not happen weekly, it occurs at an agreed frequency. Typically, this occurs monthly. During these meetings, participants in need of a loan will state their needed amount. If the total amount requested by every member who needs a loan exceeds the loan fund, the group will discuss adjustments so every member is satisfied; the loan priority list may be used. The group asks the purpose of the loan and how the person plans to pay it back. It is possible that the group would decline a loan if the consensus is that the purpose is not acceptable or if the person does not have a plan for paying back. One person may only have a loan for three months so that every member has a chance to borrow if needed. Interest should be paid back every month until the loan is completely repaid. The amount of this payment goes to the loan fund to be loaned out.

Share-outs can only be received once the saving cycle is over. These share-outs include total savings and any interest accrued. This means they cannot withdraw during the year to meet spending needs. If a shock occurs, their only option will be to borrow or save less. The participant may not use their own savings to account for this shock. Borrowing, instead of pulling out savings, is more expensive as the loan has to be repaid with interest.

Those who have not paid back the loan at the end of the cycle will use their savings to pay back the loan; therefore, their share-out will be their debt minus their saved amount and any interest accrued. Since the loan was canceled, the shares used to repay that loan will be passed on the general fund. This has major consequences on the participant and also on the whole group.

B. Study Design

Seed Effect currently has about 4,300 surveyed participants in 489 VSLA groups in three locations in Uganda: Moyo, Adjumani and Yumbe. The goal was to survey 40% of total participants per group; this number is predetermined by Seed Effect.

The non-refugee groups, made up of Ugandan host communities serve as a 'control group' to which we can compare the impact of VSLAs. The 'treatment group' consists of South Sudanese refugees participating in VSLAs in refugee settlements, which are similar and closely located to

host communities. Any differences between non-refugee and refugee participants will be controlled for through multiple regression analysis.

The survey is conducted in two phases. First, the social survey is administered to randomly-selected members within each VSLA. This is done prior to the beginning of the VSLA savings and borrowing activities. Each VSLA operates for one year. At the end of the year, these members are administered a second survey. This will allow us to measure the *change* in total savings, assets (e.g., livestock purchases), food consumption (e.g., frequency of meat consumed), and household dynamics (e.g., number of children in school).

The initial survey was given to groups that started between June 2017 and January 2018. The second round of surveys was given between June 2018 and January 2019. In addition to the social surveys, each VSLA also makes quarterly reports that provide data on each participants' savings and borrowing. The social surveys allow us to measure changes in household wealth, health and sanitation. By analyzing the data from the social surveys, we can look at any changes in wealth and test to see if savings/borrowing by a household can lead to changes in the total wealth over the year.

C. First Survey Results

The first survey has information about a participant before they joined the Seed Effect VSLA. We can look into demographics, financial information, group dynamics and access to savings and borrowing through information in this survey. Summary statistics for about 4,300 participants who received the first survey are below.

Figure 1 shows refugees tend to have more access to education and are more likely to be female, although these differences are very small. This figure also shows how a higher concentration of the population in Moyo are refugees compared to Yumbe or Adjumani. In regards to wealth, **Figure 2** shows how refugees tend to believe they are relatively less income steady than host participants. The figure also shows that even those who have more known wealth or maybe host participants are income unsteady. There is also a large gap in wealth seen between refugees and non-refugees because refugees tend to have no electricity, own fewer bikes and own fewer animal assets than non-refugees.

VSLA group dynamics and group characteristics also differ between refugees and non-refugees, as seen in **Figure 3**. Refugees tend to have a higher agreed share value in their beginning contract, this is not significant. However, the interest rates, on average, are lower; this difference is not by much. So, if refugees maximize their savings to five shares every week, their saving imports will be higher, yet their saving's growth through interest rates will be lower. Also, refugee groups tend to be more female, have less wealth in animal assets, are more Christian and tend to go to church in similar frequently than non-refugees.

Figure 1: Demographics					
Variables		**Refugee Mean**	**Refugee Std. Dev.**	**Non-Refugee Mean**	**Non-Refugee Std. Dev.**
		n = 2,585		n = 1,719	
Dependents		5.45	2.99	5.32	3.09
School Aged Dependents	***	3.58	2.24	3.24	2.23
Dependents in School	***	3.29	2.18	2.87	2.17
Had Primary Education	**	0.57	0.50	0.61	0.49
Had Secondary Education	***	0.22	0.41	0.26	0.44
Gender	***	0.82	0.39	0.75	0.43
Lives in Adjumani	**	0.32	0.46	0.35	0.48
Lives in Moyo	**	0.38	0.48	0.41	0.49
Lives in Yumbe	***	0.31	0.46	0.23	0.42

*T-test of equal means: *** p<0.01, ** p<0.05, * p<0.1*

Figure 2: Assets					
Variables		**Refugee Mean**	**Refugee Std. Dev.**	**Non-Refugee Mean**	**Non-Refugee Std. Dev.**
		n = 2,585		n = 1,719	
Income Steadiness (1 = Yes)	***	0.76	0.43	0.70	0.46
Has Electricity (1 = Yes)	***	0.47	0.50	0.75	0.43
Owns a Bike (1 = Yes)	***	0.23	0.42	0.34	0.47
Animal Value (ln)	***	4.51	5.84	9.62	5.48

*T-test of equal means: *** p<0.01, ** p<0.05, * p<0.1*

Figure 3: Group Dynamics					
Variables		**Refugee Mean**	**Refugee Std. Dev.**	**Non-Refugee Mean**	**Non-Refugee Std. Dev.**
		n = 2,585		n = 1,719	
Group Per Share Value		7.09	0.71	7.08	0.36
Group Interest Rate	**	10.43	3.11	10.91	2.74
Group Difference in Religiosity	***	3.53	0.56	3.09	1.06
Group Difference in Gender	***	0.82	0.21	0.75	0.20
Group Difference in Religion	***	0.62	0.30	0.38	0.33
Group Difference in Animal Value	***	11.76	4.99	14.71	2.54

*T-test of equal means: *** p<0.01, ** p<0.05, * p<0.1*

It is important to look at differences in access for both savings and borrowing before the Seed Effect VSLA. **Figure 4** shows refugees had less access to savings before Seed Effect. In fact, 26.71% of refugees had no access compared to 12.58% host participants. We also see that out of those who had access to savings, non-refugees and refugees borrowed at the same rates. Around 46% of both groups borrowed with access. Similarly, access to borrowing differs between refugees and non-refugees. **Figure 5** shows that a higher rate of refugees had no access to borrowing before Seed Effect. In fact, 33.08% of refugees had no access compared to 15.24% of hosts.

E. Summary

The summary statistics for the first round of surveys show how both refugees and non-refugees can be compared as a lot of their characteristics are similar. The differences in the control and treatment groups are clearly not random. Large differences between refugees and non-refugees exist in regards to wealth factors such as the level of electricity, the value in animal assets. They also exist in group factors such as the density of females, Christians or churchgoers in the group. Group wealth also differs largely; refugees tend to own less in animal value. In regards to previous access to savings and borrowing, refugees tended to have less access to both. This underscores the importance of accounting for these differences in order to estimate the impacts of the VSLA programs. This is discussed in detail in the next section.

Key for Figure 4 and Figure 5

Frequency
Row Percentage
Column Percentage

Figure 4: Savings Access						
Note: All variables are significant at 99% confidence	**Refugees** n = 2,512			**Non-Refugees** n = 1,701		
	Didn't Save	Saved	Total	Didn't Save	Saved	Total
No Access to Save	658	13	671	201	13	214
	98.06	1.94	100	93.93	6.07	100
	39.61	1.53	26.71	19.9	1.88	12.58
Access to Save	1,003	838	1,841	809	678	1,487
	54.48	45.52	100	54.4	45.6	100
	60.39	98.47	73.29	80.1	98.12	87.42
Total	1,661	851	2,512	1,010	691	1,701
	66.12	33.88	100	59.38	40.62	100
	100	100	100	100	100	100

Figure 5: Borrowing Access						
Note: All variables are significant at 99% confidence	**Refugees** n = 2,585			**Non-Refugees** n = 1,719		
	Didn't Borrow	Borrowed	Total	Didn't Borrow	Borrowed	Total
No Access to Loan	844	11	855	253	9	262
	98.71	1.29	100	96.56	3.44	100
	36.01	4.56	33.08	19.61	2.1	15.24
Access to Loan	1,500	230	1,730	1,037	420	1,457
	86.71	13.29	100	71.17	28.83	100
	63.99	95.44	66.92	80.39	97.9	84.76
Total	2,344	241	2,585	1,290	429	1,719
	90.68	9.32	100	75.04	24.96	100
	100	100	100	100	100	100

IV. Methods

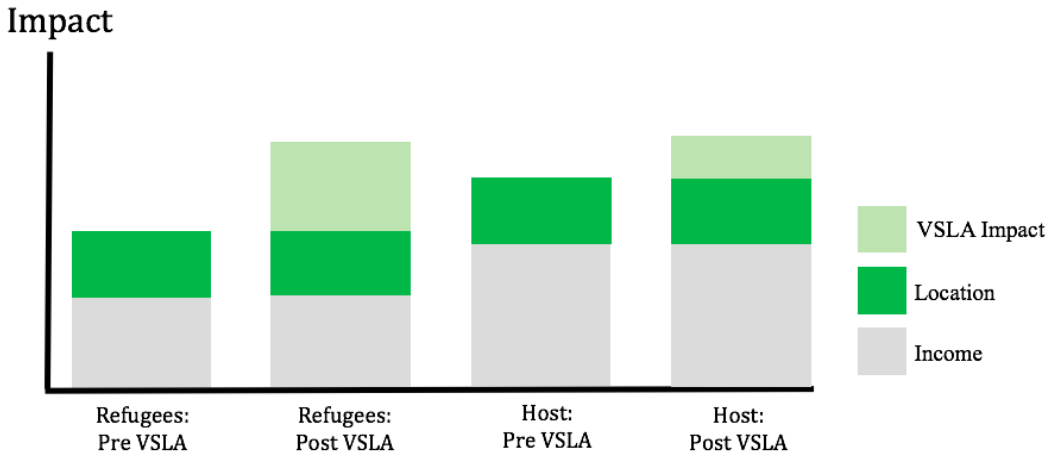
The literature explained above shows the importance of studying the potential impacts of VSLAs on various participants. To measure the impact of VSLA participation, regressions will be run on changes in saving and changes in borrowing across participants. The focus is on whether the participant is a refugee or not. Examining the changes in saving and borrowing after the completion of the program will allow us to test whether expanding access to the VSLA changes participant behavior and whether there are changes in quality of life (Karlan & Zinman, 2009).

The relative impact of participation in VSLAs between refugee and non-refugee groups will be estimated through a "difference-in-differences" regression analysis that is common in this literature (Armendáriz and Morduch 2010). Difference-in-differences analysis allows us to estimate the effects of VSLAs on refugees (treatment group) compared to members from the host communities (control group). To measure the difference between the two groups, we will compare the change over time from the first survey to the second survey.

Figure 6 shows a simple illustration on how this study will analyze the variables that measure impact through the difference-in-differences economic model. The figure shows that due to refugees' lower initial wealth, we expect that the impact of the VSLA will be greater within the refugee participants, as they had less access to savings and borrowing. Initial wealth is important to include because if a participant has a relatively higher wealth than the average participant, then those wealthier participants are expected to have higher benefit from microfinance programs (Karlan & Zinman, 2009). With more wealth, they have the ability to save more and less of a need to borrow.

Even though the participants are randomly surveyed within each VSLA, there is potential selection bias in this study since the participants themselves choose whether they participate in the VSLA program. To address for selection biases within this study, it is important to use the information on borrowers before the VSLAs; this information will be found in the first social survey. Comparing the annual differences between refugee and host participants will help address biases due to the broadly felt economic and social changes and will account for the differing base levels (Armendáriz and Morduch 2010). These differing base levels are shown by the first and third columns in **Figure 6.**

Figure 6: Difference-in-Difference Figure



The first difference between the host and refugee communities that we account for are household attributes, which include the number of people in the family, education, etc. These are not expected to change (but may) and are represented in **Figure 6**. Then, there are broad economic changes based on location which include changes related to the economic environment of each community. This could include a general growth in population and negative events such as malaria outbreaks, etc. Another broad economic change can include the availability of housing and food. These factors should increase during the year and are also represented by the location section of the figure. It is critical to control for all these differences across host and refugee communities because they will account for differences in changes in wealth that are *not* due to the availability of VSLA savings and borrowing programs.

The impact of the VSLA programs comes from changes in savings and borrowing that cannot be attributed to other changes listed above. In **Figure 6**, they are shown by the change in light green. For example, we expect refugees to accumulate health and sanitation over the year. Since we are trying to identify causality, the data and surveys we will receive will show us the detailed effects of VSLAs compared to growth in the community. The goal is to separate the VSLA impact from the total community wealth.

A. Model Specification

The difference-in-difference approach described above is estimated in a series of regressions. The models below include five sets of explanatory variables: $\boldsymbol{\delta}$, **X**, **Z**, $\boldsymbol{\Sigma}$, $\boldsymbol{\phi}$, and $\boldsymbol{\rho}$. Each group includes several characteristics of a participant that will be explained below.

Model 1

(1) $$\Delta Y = \beta_0 + \delta\beta_1 + X\beta_2 + \Sigma\beta_3 + \phi\beta_5 + Z\beta_6 + \varepsilon_i$$

The dependent variables are represented by ΔY. The regressions will look at how each independent variable will affect the change in savings and change in borrowing.

Similarly, Model 2 includes the same independent variables. However, this specific model focuses on what the loans were used for. Only borrowing impacts will be measured through this model as savings cannot be pulled out of the VSLA until the cycle is over. The change, or impact, will be measured through the change in dependents who attend school and change in animal assets. The starting household characteristics and location will be included to measure impact as to account for external factors that may affect impact.

Model 2

(2) $$\boldsymbol{Impact = \beta_0 + \delta\beta_1 + X\,\beta_2 + \Sigma\,\beta_3 + \phi\,\beta_5 + Z\beta_6 + \varepsilon_i}$$

The first variables, $\boldsymbol{\delta}$, represents the refugee status of a member, meaning whether a participant is a refugee or a host participant. If a participant is a refugee instead of a Ugandan citizen, then he or she may have lower starting wealth and more barriers to increase his or her wealth (Phillips, 2004). The barriers include lack of access to financial services in both the savings and borrowing sector. Also, since refugees are displaced from their homes, they have less social capital, so they may not have access to informal borrowing from friends and families. Phillips (2004) suggests that refugees who participate should borrow more and also experience a larger marginal increase to household income than non-refugees.

The second group of variables, **X**, includes individual participant demographics. Independent characteristics included in **X** are education, household size, and gender. Education may explain preferences in savings and borrowing as the higher the education, the more likely the participant will save and invest in the future, rather than borrow (Hashemi et al., 1996; Brannen, 2010; Barnes, 2001). Also, the more educated a participant can be, the more likely one will benefit financially from taking out a loan (Karlan & Appel, 2011; Mel et al., 2008). The size of the household is important to account for because the larger the number of dependents is, the more likely savings will be lower due to the current needs of dependents. There may also be a higher need for borrowing due to income shocks that may be more likely as the size of the household increases. This also includes the gender of the participant. The gender of a participant is an important characteristic as studies have found that programs that target women are most successful (Dupas & Robinson, 2013; Hashemi et al., 1996). Past literature found that women may be impacted by these programs more than men because they are more likely to save for future needs (Brannen, 2010). These future needs might include dependent's education, so expenditures in school fees might increase throughout the cycle.

The initial wealth of specific participants is represented by $\boldsymbol{\Sigma}$**.** Participants also may have various levels of income steadiness, which measure an individual's perception of wealth status. Participants who are less income steady are more likely to borrow more and save more in order to smooth out consumption and deal with times of crisis (Brannen, 2010). The value of livestock ownership and type of electricity are included when looking at wealth. For example, if a participant has electricity from a generator, they may be relatively wealthier than the average participant (Hashemi et al., 1996).

Finally, groups vary financially due to the VSLA contract. Factors such as the interest rate and share value will differ depending on the group**.** The interest rate will affect savings and borrowing because it will determine how much savings can grow once loans have been paid

(Brannen, 2010). Theoretically, a higher interest rate will increase the incentive to save, while increasing the costs of borrowing. Also, the value of each group's share will determine the minimum or maximum amount that can be saved, determining the amount that may be loaned out and therefore how much interest is accrued. As mentioned before, a share is the predetermined amount of money each participant must save each meeting. These group characteristics are accounted for in $\boldsymbol{\phi}$.

Finally, categories under $\boldsymbol{Z}$, include specific VSLA group characteristics. Participant groups vary in location, as some groups are located in Adjumani, Moyo or Yumbe. This may be important as a specific region may be initially wealthier. Within VSLAs, there are also indicators of social capital and aggregate initial wealth within each group. If a group is relatively wealthier as a whole, there is a larger supply of loanable funds. This increases borrowing and results in higher gross returns to all participants (Brannen, 2010). Also, group differences and similarities in regards to religiosity and gender can determine how socially cohesive each group is. Social cohesion may be more common among groups with more similar characteristics. This may increase the level of lending activity since people may be more willing to save more and lend to those they trust.

B. Predictions in savings and borrowing

Due to the differences in characteristics, the savings and borrowing behavior of refugees and non-refugees are likely to differ. Generally, refugees have less access to existing financial services. Therefore, we expect them to be impacted more by a VSLA compared to a non-refugee. It is expected that refugees tend to have less current wealth and are less income steady due to their lack of a stable home (Brannen, 2010). This would imply that since refugees begin with less wealth, they are expected to experience a larger change in savings from participation in the VSLAs. Similarly, it is likely refugees will experience a larger increase in borrowing. In addition, borrowing behavior may be affected by the inability to pull out savings until the end of the program. This may affect those who are typically less income steady, such as refugees, because if income shocks occur during the VSLA cycle, they may need to borrow in order to account for these income shocks.

In addition to wealth differences between refugees and non-refugees, demographics may also play a role in changes in savings and changes in borrowing. Demographics are likely to affect refugee savings and borrowing behavior differently than their non-refugee counterparts. In fact, since refugees tend to have more unstable access to financial services, they are more likely to borrow more (Travis 2014). Also, refugees from South Sudan are expected to be more likely female than male as South Sudanese husbands and fathers are staying back in South Sudan for work or war (Dear, 2017). Since women tend to have less access to savings and borrowing, they are more likely to see positive effects from a loan (Karlan and Zinman, 2009).

VI. Results and Impact Assessment

The following chapter will look at the effects of Village Savings and Loan Associations (VSLAs). The initial Seed Effect survey and the final Seed Effect survey provided data per participant at two points in time: prior VSLA participation and post VSLA participation. We ran

a linear regression on cross-sectional differences to account for standard error within the data. To account for outlier contamination, we ran robust regressions.

A. Effects in Changes in Saving and Changes in Borrowing

The methods section explains the initial models used to look at the impact of various independent variables on change in savings and change in borrowing. **Figure 7** shows initial regressions and the results in the column labeled *Change in Savings (ln).* The impact of these variables on change in borrowing are shown in the column labeled *Change in Borrowing (ln).*

i. Household preferences

Household preferences, including education and the number of dependents, were expected to affect saving and borrowing rates. Higher education, shown by *Had Primary Education*, should lead to higher savings as they are more likely to invest in the future (Hashemi et al., 1996; Brannen, 2010; Barnes, 2001). Also, a higher number of dependents might lead to less saving, due to less disposable income, and more borrowing, in case of shocks. *School Aged Dependents (NUM)* and *Dependents in School (NUM)* show these results. The final results on this are not statistically significant, as shown in **Figure 7.**

ii. Demographics

Demographics of a participant were expected to affect the savings and borrowing behavior. Women were expected to be more likely to save as they were more likely to have little to no access to financial services before microfinance (Dupas & Robinson, 2013; Hashemi et al., 1996). The results from this study were not significant. Also, the results in **Figure 6.1** show no statistical difference in the change in savings between refugees and non-refugees.

Refugee status was also expected to affect how much he or she borrowed. This is because of the lack of access refugees had in the refugee settlements. Those with refugee status are expected to borrow more (Phillips,2004). The results in the first column of **Figure 7** indicate that refugees borrowed more compared to the host participants. In fact, borrowing is approximately 980% higher in for those in refugee status. Those participants with refugee status borrowed significantly more compared to the hosts.

Figure 7: Change in Savings and Change in Borrowing

Variables	Change in Savings (ln)	Change in Borrowing (ln)
School Aged Dependents (NUM)	-0.176	-0.058
	(0.137)	(0.130)
Dependents in School (NUM)	-0.139	-0.034
	(0.135)	(0.133)
Had Primary Education (1 = Yes)	-0.334	0.422
	(0.373)	(0.314)
Gender (1 = Female)	-0.681	0.362
	(0.738)	(0.678)
Refugee Status (1 = Refugee)	-0.203	2.383***
	(0.466)	(0.438)
Income Steadiness (1 = Yes)	-1.538***	0.999**
	(0.423)	(0.325)
Has Electricity (1 = Yes)	-2.101***	-0.389
	(0.387)	(0.338)
Animal Value (ln)	-0.003	0.014
	(0.033)	(0.029)
Group Per Share Value (ln)	-1.240**	-1.443**
	(0.473)	(0.462)
Group Interest Rate	0.159***	0.046
	(0.036)	(0.032)
Group Animal Total Value (ln)	0.358**	0.131
	(0.124)	(0.140)
Group Difference in Religion	-0.265	0.871
	(0.779)	(0.668)
Group Difference in Gender	-3.610**	-0.412
	(1.209)	(0.986)
Group Difference in Religiosity	0.105	0.615**
	(0.268)	(0.199)
Group Difference in Animal Value (ln)	-0.472**	-0.066
	(0.144)	(0.161)
Constant	18.792***	15.115***
	(3.297)	(3.001)
Observations	1,018	1,018
R-squared	0.101	0.082

*Robust t-statistics in parenthesis *** p<0.01, **p<0.05, *p<0.1*

Figure 7 Notes:

Group Animal Total Value (ln)	The natural logarithm of the total amount of animal assets in the group in UGX.
Group Difference in Religion	The absolute value difference between whether a participant is a Christian and how "Christian" the group is.
Group Difference in Gender	The absolute value difference between whether a participant is a female and how "female" the group is.
Group Difference in Church Attendance	The absolute value difference between how often a participant goes to church and the average group church attendance is.
Group Difference in Animal Value (ln)	The absolute value difference between participant's animal ownership value and the average value of animals within a group.

iii. Household Wealth

The starting wealth of a participant also affects the savings and borrowing behavior. Poorer participants may borrow more and save more in order to smooth out consumption and deal with times of crisis (Brannen, 2010).

The variable *Income Steadiness* looks at how income steady a participant sees himself or herself. If the participant sees himself or herself as income steady, he or she saves approximately 78.52% less. At the same time, if the participant sees himself or herself as income steady, he or she borrows approximately 169.0% more. Since the participant sees himself as income steady, he or she borrows more due to more income that can be used for expenses.

Similarly, access to electricity is another determinant of wealth. Electricity shows wealth so those with less electricity may be poorer. Those participants with electricity saved approximately 87.77% less. More savings by the poorer may also be related to the lack of access to financial services the poorest people have. Once one gains access for the first time, he or she is more likely to save. Also, savings may be used as insurance, which poor people need more of, or they may be saving to build up to pay for lump investments. Wealth determined by the value of livestock, *Animal Value (ln),* does not have significant results.

iv. VSLA Group Characteristics

Each VSLA group has different characteristics as each group develops its own constitution. They all have the ability to choose the group interest rate and share value. Group per share value, the amount that a participant is allowed to save at each meeting. It has a negative relationship with change in savings and borrowing. This means that as share value goes up, there is less saving and borrowing. This occurs because each group's share determines the minimum or maximum amount that can be saved. There is no partial payment per share so if one cannot afford a full share, then he or she can't purchase it. **Figure 7** shows that as a group per share value increases by 1%, savings decrease by 1.24% and borrowings decrease by 1.44%. These

results can be explained by the higher share price, the fewer shares are purchased, the less in total that can be borrowed, and the less interest that may be accrued at share-out.

The group interest rate has a negative relationship with the change in saving. As the interest rate goes up by 1%, there is an increase of 15.9% in savings. Higher interest rates make it more attractive to save as the return for that saving will be higher.

v. Group Dynamics

Different VSLA groups may differ in wealth. The wealth of the group has an impact on the change in savings. More wealth leads to more aggregate initial wealth within each group. If a group is relatively wealthier as a whole, there is a larger supply of loanable funds. In fact, as groups increase in wealth by 1%, as seen by the *Group Animal Total Value (ln)*, participants save 35.8% more.

Economic theory in microfinance suggests that a group setting can create trust between participants. As mentioned in the previous chapter, groups that include participants of similar characteristics, such as religion, gender and wealth can include social cohesion, which may lead to increase trust. This trust can lead to increased savings. The data showed this to be true. **Figure 7** shows the impact that the gender dynamics have on the trust within the group. In fact, groups with more gender diversity save drastically less than groups with less gender diversity. For example, if a participant is a female in a group of 50% women and 50% men, then she will probably save less than another female in a group of 75% women and 25% men.

A group with a greater variation in gender dynamics, *Group Gender,* leads to a drastic decrease in savings. Similarly, the larger the wealth gap, as seen through *Group Animal Value Difference*, the less participants save. As wealth difference increases then savings are less. For example, if a participant is relatively wealthy in a group of 50% relatively wealthy and 50% poor, then he or she will probably save less than another relatively wealthy participant in a group of 75% relatively wealthy and 25% poor. The diversity in wealth may suggest less social cohesion as people might not trust those who have different financial statuses.

The *Group Church Religiosity* variable looks at the absolute value difference between how often a participant goes to church and the average group's church attendance is. This variable looks at the religiosity of a group. The more diversity in church attendance within a group there is, the more one will borrow. As Religiosity diversity increases, participants tend to borrow more. This is interesting as we expected the more diversity there is the less one will borrow due to less social cohesion.

B. Borrowing Behaviors

Various factors may also impact whether a participant borrowed and for what they borrowed for. The specific dynamics of certain participants will make borrowing either more or less attractive. The following section discusses these results.

i. Who Borrowed?

Figure 8, the column *Borrowed* shows what impacted borrowing. Women tended to borrow more than men. This makes sense as the theory states that women face various barriers to informal borrowing. The wealthier participants also borrowed. This also makes sense as a participant can borrow more depending on how much they save. The more one saves, the more they can borrow.

ii. Why Borrow?

Interestingly, the third column of **Figure 8** shows that refugees tend to borrow more for school. Economic theory supports this result as refugees have less wealth and therefore have less money for school fees. Poorer borrowers will focus on spending their new income for household rather than the business. Similarly, wealthier participants borrowed for school. Economic theory also supports this as the wealthier have more disposable income to spend on business development and growth.

Interestingly, higher interest rates had a negative correlation with borrowing for business but a positive correlation with borrowing for school. Economic theory suggests that higher interest rates encourage savings. As mentioned above, wealthier participants borrowed for business. This may suggest that those wealthier participants may have more disposable income to save and focus their efforts on this rather than borrowing.

Social cohesion in regards to gender also impacted the borrowing behaviors of participants. Those groups with less gender diversity-focused borrowing on business. On the other hand, those groups with more gender diversity discouraged borrowing for school. These results may suggest that social cohesion can lead to social investments rather than business investment.

C. Impact Assessment

Accounting for external factors allows us to closely look at the actual VSLA impact. The change in dependents in school and change in the animal value of the participant gives insight into how access to credit, insurance and savings through VSLAs may affect the wealth of the participant. These changes only account for income received through loans. This is because the second survey is given when the participants receive their share-out, therefore the impact from this money has not been documented.

The differences in differences model looks at the impact and accounts for any external factors that may also impact these variables. **Figure 9** shows the impact of these variables on change in the number of dependents in school are shown in the column labeled *Change in Number of Dependents in School*. The third column looks at the impact of *Change in Animal Value (ln)*. The following section will describe the significant results.

Figure 8: Borrowing Behaviors

Variables	Borrowed	Borrowed for Business	Borrowed for School
School Aged Dependents (NUM)	-0.005	0.013	-0.001
	(0.005)	(0.014)	(0.014)
Dependents in School (NUM)	0.006	-0.018	0.012
	(0.005)	(0.014)	(0.014)
Had Primary Education (1 = Yes)	0.011	-0.01	-0.002
	(0.014)	(0.032)	(0.032)
Gender (1 = Female)	0.126***	0.037	0.015
	(0.035)	(0.063)	(0.057)
Refugee Status (1 = Refugee)	-0.020	0.031	0.108**
	(0.017)	(0.042)	(0.040)
Income Steadiness (1 = Yes)	0.032*	0.063	-0.055
	(0.014)	(0.035)	(0.034)
Has Electricity (1 = Yes)	0.014	0.001	0.110**
	(0.017)	(0.034)	(0.033)
Animal Value (ln)	0.000	-0.003	0.003
	(0.001)	(0.003)	(0.003)
Group Per Share Value (ln)	-0.03	-0.067	0.042
	(0.023)	(0.045)	(0.043)
Group Interest Rate	-0.000	-0.019***	0.011**
	(0.001)	(0.003)	(0.004)
Group Animal Total Value (ln)	0.002	-0.024	0.038*
	(0.008)	(0.015)	(0.015)
Group Difference in Religion	0.038	0.064	-0.028
	(0.029)	(0.069)	(0.067)
Group Difference in Gender	0.109*	0.276**	-0.241**
	(0.044)	(0.099)	(0.093)
Group Difference in Religiosity	-0.004	0.037	-0.019
	(0.007)	(0.024)	(0.022)
Group Difference in Animal Value (ln)	0.002	0.018	-0.029
	(0.009)	(0.017)	(0.017)
Constant	0.968***	1.223***	-0.338
	(0.152)	(0.322)	(0.305)
Observations	-0.005	0.013	-0.001
R-squared	(0.005)	(0.014)	(0.014)

*Robust t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Figure 8 Notes:

Group Animal Total Value (ln)	The natural logarithm of the total amount of animal assets in the group in UGX.
Group Difference in Religion	The absolute value difference between whether a participant is a Christian and how "Christian" the group is.
Group Difference in Gender	The absolute value difference between whether a participant is a female and how "female" the group is.
Group Difference in Church Attendance	The absolute value difference between how often a participant goes to church and the average group church attendance is.
Group Difference in Animal Value (ln)	The absolute value difference between participant's animal ownership value and the average value of animals within a group.

i. Number of Dependents in School

Those participants with refugee status had a positive impact on the number of dependents in school, as the number of dependents increased. Increased access to financial services may be the reason why many of the refugees now have ways to pay for more school fees.

As a group's interest rate increased, the number of dependents in school decreased. This shows how the impact of financial services may be halted if the interest rate is too high. Borrowers may borrow and have to use money from school fees in order to pay interest.

ii. Change in Animal Value for Each Individual

Change in individual animal value, as shown by column *Change in Animal Value (ln)* of **Figure 9**, may indicate an increase in wealth during VSLA participation. There is a relationship between the number of school-aged dependents and change in animal value. Those households with more school-aged children saw an increase in animal value by 25.6%. This may indicate an increase in wealth. However, those households with more dependents in school saw a decrease in total animal assets by 27.8%. This makes sense as these households may be spending more on education over increasing assets.

Income Steadiness also impacted how much change in animal assets there are. In fact, those participants who see themselves as more income steady has an increase in animal assets by 211%. This may suggest that access to financial services may give the opportunity for those wealthier participants to invest more on animal assets.

The group interest rate also had an impact on this change. Those groups with a higher interest rate saw an increase. As the interest rate increase by 1%, the value of animal assets also increased by 13.8%.

Figure 9: Impact Assessment

Variables	Change in Dependents in School (NUM)	Change in Animal Value (ln)
School Aged Dependents (NUM)	0.226***	0.256*
	(0.05)	(0.10)
Dependents in School (NUM)	-0.423***	-0.278**
	(0.05)	(0.10)
Had Primary Education (1 = Yes)	0.08	-0.07
	(0.07)	(0.29)
Gender (1 = Female)	-0.088	-0.683
	(0.18)	(0.63)
Refugee Status (1 = Refugee)	0.366***	-0.475
	(0.09)	(0.36)
Income Steadiness (1 = Yes)	-0.04	1.136***
	(0.08)	(0.33)
Has Electricity (1 = Yes)	-0.015	0.411
	(0.08)	(0.32)
Animal Value (ln)	0.007	-0.517***
	(0.01)	(0.03)
Group Per Share Value (ln)	-0.004	0.141
	(0.08)	(0.35)
Group Interest Rate	-0.019**	0.138***
	(0.01)	(0.03)
Group Animal Total Value (ln)	-0.022	0.641***
	(0.03)	(0.09)
Group Difference in Religion	0.059	-0.02
	(0.15)	(0.60)
Group Difference in Gender	0.083	-1.572
	(0.25)	(0.97)
Group Difference in Religiosity	-0.085	0.106
	(0.05)	(0.20)
Group Difference in Animal Value (ln)	0.012	-0.200*
	(0.03)	(0.09)
Constant	0.989	-3.523
	(0.59)	(2.45)
Observations	0.226***	0.256*
R-squared	(0.05)	(0.10)

*Robust t-statistics in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Figure 9 Notes:

Group Animal Total Value (ln)	The natural logarithm of the total amount of animal assets in the group in UGX.
Group Difference in Religion	The absolute value difference between whether a participant is a Christian and how "Christian" the group is.
Group Difference in Gender	The absolute value difference between whether a participant is a female and how "female" the group is.
Group Difference in Church Attendance	The absolute value difference between how often a participant goes to church and the average group church attendance is.
Group Difference in Animal Value (ln)	The absolute value difference between participant's animal ownership value and the average value of animals within a group.

D. Summary

The results of the regression show that various factors can affect change in savings and change in borrowing. Refugees tend to take advantage of the borrowing aspect of the VSLA. In fact, refugees borrow more than non-refugees. Also, participants with no energy, which suggests they are less wealthy, save more. In regards to impact assessment, there is a need for financial services among refugees in order to increase investment in school for their children. Once participants become wealthier, they are more likely to invest in businesses, as shown by our results. Social cohesion, again, shows to influence the financial behaviors of participants. Groups with gender diversity and groups with wealth diversity drastically reduced changes in savings.

VII. Conclusion

South Sudanese refugees have settled in Northern Uganda in order to live safer lives. Uganda, with open refugee policy, has allowed refugees to integrate into society and into the economy. Yet, in many parts of rural Uganda, there is little to no access to financial institutions. Past literature has shown that access to forms of savings, borrowing, and insurance can encourage economic growth in the lives of the poorest (Collins et al., 2009).

Microfinance is an alternative to formal financial services because it offers ways for the poor to save and borrow and have insurance. VSLAs are a unique form of microfinance that offers the three services common in formal financial institutions. This study looked at the financial and social impacts that VSLAs have on the lives of South Sudanese refugees and Ugandan host citizens. In theory, South Sudanese refugees should benefit from the introduction of VSLAs as they are poorer, have fewer assets and have been displaced from their homes and families.

The data in this study was collected by Seed Effect, a non-profit, and includes various characteristics of a participant before and after the introduction of VSLAs. These characteristics measure demographics, wealth and group dynamics of the participant.

To measure this impact, we used the differences-in-differences regression analysis. This analysis compares the annual differences in impacts between refugees and non-refugees. The first model

looked at the effects of participation on changes in savings and borrowing behavior. The second model looked at the effects of participation on other quality of life indicators. These included the changes in the number of dependents in school and the changes in the total value of animals owned by the participants. Due to the nature of the survey, we were only able to look at the effect of new borrowing on these changes in quality of life.

Before measuring the impact, we analyzed data from the first survey. The first survey provided information on refugees and non-refugees before access to VSLAs. These data showed that refugees and non-refugees have similar gender dynamics, educational background, and household size. Yet, refugees tend to be less income steady and owe fewer assets. Refugees also tended to have less access to financial services before VSLAs; in fact, non-refugees were more likely to save and borrow than refugees before participation in the Seed Effect VSLA program. Focusing on the initial similarities and differences was important to estimate the true impacts of the VSLA program.

In general, this study found significant impacts of the VSLAs on the short term financial and social well-being of participants, compared to pre-VSLA participation. Regardless of refugee status, VSLA participation led to an increase in savings when groups are more similar. This similarity can suggest that there is more social cohesion between the groups and therefore more trust. For example, groups with little gender diversity saved more than those with more gender diversity. This finding is consistent with past literature, as social cohesion has shown to positively impact the success of microfinance programs (Brannen, 2010). Also, women benefited from VSLAs as they tended to spend more on school fees at the program. This is also consistent with past literature that has shown that microfinance tends to benefit women in particular (Dupas & Robinson, 2013).

Each group's interest rate and share value, which is the predetermined amount of money that is saved by each member at every meeting, have a direct impact on whether a participant saves or borrows. As interest rates increase, participants were more likely to save more and less likely to borrow more post-VSLA. This makes sense as the economic theory states that higher interest rates make it more attractive to save and less to borrow. In addition, higher share values discouraged both savings and borrowing. This may be because if a participant cannot save a full share, they cannot save at all. The less an individual saves, the less he or she can borrow.

When results are focused on refugee status, the data showed that refugees tended to borrow significantly more following the introduction of the VSLA. This is consistent with expectations since refugees had little access to credit prior to the introduction of the VSLA. Further analysis of data showed that refugees tended to borrow specifically for school and that refugees spend more on school fees at the end of the VSLA cycle compared to the beginning. This finding suggests that access to VSLA can impact the social well-being of a refugee family. The data also shows that those who borrow for business tend to be wealthier. Wealthier participants had a higher value in animal assets post-VSLA. If financial services through VSLAs continue over a year, participants may gain wealth and begin to invest in their household and eventually in business.

Through this study, there were various limitations. First, this study lacked access to a randomized control group that could end the possibility of selective bias. In the future, VSLA

through the Seed Effect program among refugees and host communities should include more effective use of a control group. A control group should include people both refugees and non-refugees in the same villages who are eligible to participate but chose not to. Controlling for selection bias will be extremely valuable to measure the true impact of a program. Second, the study lacked any information on the participants' financial and social expenses post-study. This data would serve as a way to measure the impact of the share-out money, which includes all money saved and any interest accrued through the VSLA cycle. This lump sum of money can help participants in the long run with education, business, and times of emergency. With this information, there also would be a way to measure the long-term effects of the program. It is imperative to look into how this money can impact people in the short-run and as well as in the long-run.

Despite these limitations, these results have several implications for how Seed Effect operates. The first relates to the finding regarding the effect of the share size on savings and borrowing. The results show that higher share size negatively affects saving and borrowing. If the share size chosen by the group is too large, participants may be discouraged to save and borrow. Seed Effect's VSLA program might increase their positive impact in Northern Uganda if the share size could be capped. As most groups had share sizes of 1,000 UGX or 2,000 UGX, this would be a good place to start assessing how much people save with one or the other. Our data suggested that limiting the share size to less than 1,000 UGX might be most beneficial for the participants. More research needs to be done in order to find the most efficient share size regardless of the group. Also, our results showed that social cohesion appears to encourage savings. Seed Effect should continue researching whether providing participants with the options to choose the dynamic of their group will lead to more savings or not. For example, women may benefit from being in all-women groups if this dynamic creates trust. Social cohesion can also be built within VSLA groups. Seed Effect should consider ways to build trust within groups.

Since a lack of control group and no data on the impacts of the VSLA after the end of the program were limitations, Seed Effect can implement a control group that can be surveyed without being part of a VSLA. Also, a survey for the participants and the control group a year after access to the VSLA would offer more insight on whether VSLAs can have long-term impacts on participant’s lives or not.

Microfinance has evolved throughout the years in order to solve the shortcomings of previous models. VSLAs, like those examined in this thesis, have the ability to reach the poorest of the poor as it can be fully managed by citizens in rural areas once trainings have been done. Poor participants of microfinance institutions, such as refugees, through the saving and borrowing components within the VSLAs, can increase current income in order to invest in business or family. In times of emergency or health shocks, participants can lessen the negative impacts due to savings, borrowing, and/or insurance.

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IX. Variable Appendix

Change in Savings (ln)	The difference between the ln (Total saved in Program) and ln (Total Saved Last Year). This variable shows the change in savings after the program ends compared to before starting of the program.
Change in Borrowed (ln)	The difference between the ln (Total Borrowed) and ln (Total Borrowed Last Year). This variable shows the change in savings after the program ends compared to before starting of the program.
Borrowed	If Borrowed = 1, then members borrowed at least once. Borrowed = 0, then members did not borrow.
Borrowed for Business	If Borrowed for Business = 1, then members borrowed for business. Borrowed for Business = 0, then members did not borrow for business.
Borrowed for School	If Borrowed for School = 1, then members borrowed for school. Borrowed for School = 0, then members did not borrow for school.
Change in Dependents in School (NUM)	The change in number of dependents in school before and after the VSLA cycle.
Change in Animal Value (ln)	The change in Animal Value (ln) before and after the VSLA cycle.
School Aged Dependents (NUM)	Number of school aged dependents
Dependents in School (NUM)	Number of dependents in school
Primary Education	If Primary Education = 1, then members have either a full or half primary school education. If Primary Education = 0 then members have less or more than primary school education.

Gender	If Gender = 1, then member is Female. If Gender = 0, then member is male.
Refugee Status	If citizenship=1 then member is refugee. If citizenship = 0 then member is from Host Community.
Income Steadiness	If Income Steadiness = 1 then the participant is income steady. If Income Steadiness = 0 then the participant is not income steady
Has Electricity	If Has Electricity = 1, then a member has electricity from grid, generator, solar or other supply. If Has Electricity = 0 if a member has no electricity at home.
Animal Value (ln)	The natural logarithm of the value of the participant's animal assets in UGX.
Group Per Share Value (ln)	The natural logarithm of the group per share value in UGX.
Group Interest Rate	Indicates the interest rate of each group. The given value is in percentage form.
Group Animal Total Value (ln)	The natural logarithm of the total amount of animal assets in the group in UGX.
Group Difference in Religion	The absolute value difference between whether a participant is a Christian and how "Christian" the group is.
Group Difference in Gender	The absolute value difference between whether a participant is a female and how "female" the group is.
Group Difference in Church Attendance	The absolute value difference between how often a participant goes to church and the average group church attendance is.
Group Difference in Animal Value (ln)	The absolute value difference between participant's animal ownership value and the average value of animals within a group.
Lives in Adjumani	If Lives in Adjumani = 1 then Savings group is in Adjumani. If Lives in Adjumani = 0 then Savings Group is in Moyo or Yumbe
Lives in Moyo	If Lives in Moyo = 1 then Savings group is in Moyo. If Lives in Moyo = 0 then Savings Group is in Yumbe or Adjumani
Lives in Yumbe	If Lives in Yumbe = 1 then Savings group is in Yumbe. If Lives in Yumbe = 0 then Savings Group is in Adjumani or Moyo

Save Status	If Save Status = 1, then members have access to saving money. If Save Status = 0 then members have no access to saving money.
Access to Loan	If Access to Loan = 1, then members have access to borrowing money. If Access to Loan= 0 then members have no access to borrowing money.