The Impact of Microfinance on Women's Empowerment: Evidence from Rural Areas of Uganda

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"If you go out into the real world, you cannot miss seeing that the poor are poor not because they are untrained or illiterate but because they cannot retain the returns of their labor. They have no control over capital, and it is the ability to control capital that gives people the power to rise out of poverty…" -Muhammad Yunus

"If you change the life of a girl or woman, you don't just change that individual, you change her family and then her community." Dr. Helene Gayle, CARE CEO

Abstract

Microfinance is the practice of extending small collateral-free loans to underserved populations in developing areas with no access to credit. The Village Savings and Loan Association (VSLA) randomized access to microfinance treatment for women in rural areas of Uganda and tracked outcomes through surveys. This research determines the impact of microfinance by analyzing outcomes over five dimensions of women's empowerment, including decision making power, community participation, business outcomes, emotional wellness, and beliefs about women. The strongest results showed that access to the VSLA program empowered women in terms of business outcomes and decision-making power. This leads to the conclusion that microfinance can more easily impact how a woman behaves within the household than change how a woman behaves within the community.

I. Introduction

Microfinance is the practice of extending small collateral-free loans to underserved populations in developing areas with no access to credit and limited financial literacy. Access to loans allows borrowers to invest money into microenterprises and establish a reliable source of income. Microfinance institutions (MFIs), such as non-government organizations and financial inclusion agencies, typically target women borrowers because microcredit allows this vulnerable population to earn their own income and support their families. In addition, these institutions provide management and business training, which allows women to maximize the value of the physical capital. The purpose of this research is to evaluate the impact of microfinance programs, including access to microcredit and savings groups, on women's empowerment in developing areas of Uganda. This study evaluates changes in women's empowerment by tracking proxy

indicators such as decision-making power, business outcomes, community participation, emotional wellness, and beliefs about women after exposure to microfinance programs.

Women in developing areas play an important role in agricultural production by contributing to crop processing (threshing, cleaning, drying, preserving) and household activities (water and fuel collection, cooking, cleaning, sewing, tailoring, weaving, and child rearing), but their labor is non-monetized and seen as complementary rather than equal to a man's labor (Lyby, 2006). For example, women may be involved in carpet weaving or other handicrafts that create large amounts of household income, but the sale and marketing of their products is controlled by male relatives or middlemen (Lyby, 2006). Furthermore, women lack marketable skills and education, and a higher fertility rate means that they are often occupied with supporting children. Land, equipment, and other assets are traditionally passed onto sons, so without savings or wages, women have little capability to start microenterprises that require an initial investment (Lyby, 2006).

Microfinance services, including credits, savings, insurance, housing loans, remittances, and money transfers, provide capital that allow women to participate in activities that alleviate this patriarchal control over assets thereby fostering gender equality and economic progress. More specifically, microcredit allows women without collateral or a steady income to access loans of less than $1,000 USD to start a business enterprise. These microloans differ in size, but loans over $1,000 USD are not considered microcredit in developing countries. These loans are paid back in daily, weekly, or monthly installments at lower interest rates than formal institutions.

Proponents claim that microfinance empowers women by raising their self-esteem and courage, allowing formation of networks with other women in the community, and increasing their decision-making power in the household (Li, 2011). Furthermore, women are more reliable

borrowers because they have higher loan repayment rates than men in developing areas. Men are more likely to use extra income from a microloan on gambling, beer, and other social activities, while women are more inclined to invest the money into an economic activity that will bring in more income for her children (Rahman, 2017). This leads to economic gains in the form of better nutrition, higher consumption and asset accumulation, and more enrollment in school for children (Lyngdoh, 2013). As a result, the empowerment of women is directly tied with the economic development of an area, meaning that MFIs view microfinance as a strategic tool for involving women in the development process (Rahman, 2017).

Although these microloans are in the woman's name, some studies claim that the loan is still controlled by their spouses, resulting in a "more severe subordination of women [that] leaves them more vulnerable to the patriarchy system within the household or even at the society level" (Li, 2011). In addition, as women transcend out of conservative gender roles, they may be at increased risk for domestic violence as men try to reconfirm their position of power. Other opponents of microfinance argue that MFIs have aggressive loan recovery practices that seize borrowers' assets and savings, further pushing women into poverty when they default on a loan. MFIs are criticized for targeting women, since they tend to sacrifice more to repay the loan to avoid peer pressure from the community or bringing shame to their families.

To assess the effects of microfinance on women in developing countries, the concept of empowerment must be operationally defined. Female empowerment can be broadly defined as the increased ability for women to make life choices in a context where this was previously denied to them (Vu, 2015). This increased decision-making power allows individuals to positively contribute to their well-being. In a community setting, female empowerment results in a redistribution of power, expansion of resources, and increased psychological agency (Vu, 2015). There are two possible methods that assess the impact of microfinance on women's

empowerment. The process-based impact studies claim that empowerment is a dynamic process that can only be measured through indirect factors, such as accounting knowledge, managerial control over the microloan, and control over intra-household spending (Li, 2011). Other indirect indicators measure literacy, health and nutrition, labor force participation, contraceptive use, and ownership of assets (Rahman, 2017).

Meanwhile, the outcome-based evaluations use direct indicators, such as access to social networks and beliefs about life outcomes, that attempt to measure changes in the structures of gender inequality within the household and the community (Li, 2011). It is also important to note that factors such as the multi-dimensional nature of empowerment, women heterogeneity, and the availability of time series data lead to conflicting evidence on the impact of microfinance on women's empowerment (Li, 2011). Unfortunately, the World Bank and other developmental agencies have not developed an official method for measuring and tracking changes in levels of empowerment.

In summary, outcome-based evaluations and process-based impact studies are two methods of evaluating changes in women's empowerment. Although scholars have different opinions on whether microfinance is positive for women in developing communities, studies have found significant differences in women's agency both inside the household and in the community after access to credit. This paper uses the outcome-based approach to determine the impact of microfinance by analyzing outcomes over five dimensions of women's empowerment, including decision making power, community participation, business outcomes, emotional wellness, and beliefs about women. Data is from the Village Savings and Loan Association program, which randomized access to microfinance programs for women in rural areas of Uganda and tracked changes through surveys. Results were significant for community participation, business outcomes, and decision making power and highest in magnitude for business outcomes and

decision-making power. The evidence indicates that microfinance can more easily impact how a woman behaves within the household than change how a woman behaves within the community.

II. Literature Review

Numerous studies have analyzed the impact of microfinance on women's empowerment in developing communities around the world. Research conducted on the matrilineal tribal societies of India tracked outcomes for 300 microfinance women clients and 150 non-microfinance women (Lyngdoh 2013). Women in the Khasi tribes are banned from participating in any community or political decisions, and land documents often carry only the name of the husband as the head of the household. These women also lag behind in literacy rates and access to electricity and toilet facilities, while their birth rates and infant mortality rates are higher than other states in India (Lyngdoh 2013). The average loan taken out for the microfinance clients was 2,731.06 rupees, invested into pig and cattle rearing, handloom, poultry, fishery, tailoring, and knitting as enterprises. Researchers used Propensity Score Matching and Difference in Difference (DinD) techniques to conduct impact evaluations of sociopolitical and economic outcomes from 2004-2005 and 2009-2010, where pre and post intervention data was collected (Lyngdoh, 2013). Although my research did not utilize the DinD method to analyze data, this study is noteworthy because it measures decision making both within the household and in the community (through voting and political process).

The DinD method compares changes over time for a group given treatment to a control group and attributes the "difference-in-differences" to the effect of the microfinance. The DinD score for the ability to decide on purchases with little or no permission was .70, while the DinD score for improved mobility and movement through little or no permission from others was .40. The DinD score for participation in decision making through voting was .36 and holding of positions in political process (at periphery levels) was .37. Researchers concluded that

microfinance has a positive impact on women's empowerment due to better outcomes in the treatment group as compared to the control over economic and sociopolitical variables.

Another study in Bangladesh analyzed the effects of microfinance based on key empowerment indicators, such as increased decision-making power, access to assets, and security. This study also introduces an emotional component, which was also included as a set of dependent variables in my own methodology. The emotional component measures how women feel before and after receiving microloans and business training (Rahman 2017). Are they more confident in themselves, and do they feel like they can run a business, their finances, and their home without depending on a husband?

Researches used questionnaires to track changes in decision making for women in 364 households over 1.5 years, after participation in microfinance programs. Specific decisions studied in the questionnaires included decisions on child's education, child's marriage, purchase of household items, use of contraceptives, voting, visiting relatives, and borrowing. Other indicators in the questionnaires measured women's control on income, feeling secure and strong, feeling proud and dignified, and freedom to move. A t-test revealed that all of the differences in these empowerment indicators before and after receiving microcredit were significant at the 1 percent level. Healthcare for women and children only improved in 30 percent of the households, but control of income and decision on children's education improved in more than 80 percent of the households (Rahman, 2017).

Since borrowers self-select themselves to receive services, there are unobserved characteristics, such as social and business skills, that would affect the empowerment outcomes. For example, women with more interpersonal skills are more likely to participate in microfinance and more likely to feel empowered with access to credit. As a result of this selection bias, the error term is correlated with participation in microfinance. In order to solve this endogeneity

issue, researchers introduced a random effects estimator, which assumes that the observed and unobserved effects are strongly correlated (Rahman, 2017). The treatment, or access to microfinance programs, was randomly assigned to the women in my dataset, which controlled for any unobserved characteristics that could affect the empowerment outcomes.

In Mexico, researchers randomized access to credit for 16,560 women in rural communities of Nogales, Mexico and monitored results through both baseline and end line surveys between 2010 and 2012 (Angelucci, 2015). Researchers found that outcomes aligned with policymakers' belief that microcredit empowered women by "giving greater access to resources and a supportive group environment" (Angelucci, 2015). Women in the treatment group were .8 percentage points more likely to participate in financial decision making. Increased economic activity in the community resulted in a .049 standard deviation increase in trust in government, financial institutions, and other business people in the area. There was no statistically significant increase or decrease in the amount of intra-household conflict. However, the increase in the share of household resources controlled by women threatened the role of men in the treatment area, resulting in increased domestic violence (Angelucci, 2015). Although my data does not include domestic violence outcomes, this study highlights certain risks of microfinance on vulnerable populations. Intra-household conflict on decisions may have stayed the same, but the rate of domestic violence occurrence still increased. As a result, researchers emphasize the importance of educating husbands for treatment groups in developing areas.

In a study conducted in West Bengal, India, 927 households were sampled using questionnaires covering women empowerment measures, enterprise related information, and member and family socioeconomic characteristics after taking out microloans. Women's empowerment was measured across four binary dimensions, (1) the woman's managerial control over the microloan, (2) her influence over household decisions on credit, (3) her influence on

household expenses, and (4) her influence on child-related decisions (Nilakantan, 2013). These binary variables were used as the dependent variables in the regression analysis. Independent variables included the age of the woman, her education level, number of informal loan sources accessed, caste (socioeconomic class) of the household, and location of the household. Results of that study indicate that greater access to microfinance programs over a longer period of time is associated with increased influence over expenditure related decisions and child related decisions, and a decreased likelihood of the woman managing the enterprise (Nilakantan, 2013). Researchers concluded that microfinance programs caused a reallocation of influence between family members along traditional gender roles, rather than challenging existing gender roles in the household.

In China, researchers used a logistic regression to analyze data collected from a rural household survey. Frequently, the literature uses the logit model to analyze the impacts of microfinance on women's empowerment. This study analyzed two groups of women—one group of women that received a microloan and the other group that did not receive a microloan. The women's empowerment indicators, or dependent variables, included the woman's control over her income, ability to travel alone or without consent, ability to independently purchase items such as clothes, livestock, jewelry, and furniture, involvement in deciding what crops to grow, whether to open a bank account, or when to have a child. This study also included special awareness dependent variables, such as the awareness of the use of contraception, awareness of the incorrectness of arranged marriage, awareness of the female minimum marriage age, and awareness of legal method of divorce. In general, a total of 24 indicators were grouped into five dimensions: control over financial assets, mobility, purchase-making ability, decision-making power, and freedom/legal awareness (Li, 2011). This study further addressed selection bias for borrowers not only by including control variables such as the woman's education level, age, and

village, but also by controlling for the accumulated loan amount borrowed. The accumulated loan amount was a proxy for the amount of involvement in the microfinance program, allowing researchers to examine whether the impact of microfinance increased depending on level of involvement.

Researchers rejected the null hypothesis that 21 out of 24 parameters were equal to zero at the 5% significance model. In addition, variables Loan2 and Loan3 had a more significant impact on 11 empowerment indicators than Loan1, meaning that coefficients became more positive depending on the number of loans borrowed by the woman (Li, 2011). Furthermore, holding other factors constant, moderate borrowers were 33% more likely to control their own income vs. non-borrowers, and the difference was significant at the 10% level (Li, 2011). Meanwhile, borrowing between 30,000-60,000 yuan or more than 60,000 yuan doubled the probability of women purchasing furniture independently (Li, 2011). These results are important because they prove why the independent variable (indicating whether the woman received microfinance programs or not) should not be a simple indicator variable. There must be other independent variables that indicate how many loans were taken out and what the amount borrowed was. In conclusion, the researchers found that the threshold loan size beyond which microcredit could have a significant impact on women's empowerment was 30,000 yuan (Li, 2011). As women become more involved in the microfinance programs (by taking out more loans and increasing loan size), their level of empowerment rose accordingly.

The studies discussed in this section offer clear evidence of the impacts of microfinance on women's empowerment in developing countries. However, most of them focus too heavily on one dimension of women's empowerment, such as decision-making power, economic outcomes, or beliefs about empowerment. As a result, the studies differ in their results on the impact of empowerment. By combining decision making power, business outcomes, emotional wellness,

community participation, and beliefs in one model, my study aims to offer more decisive conclusions about the changes women in Uganda experience after receiving access to microloans. The following section describes the variables and theory necessary to analyze women's empowerment in this holistic manner.

III. Theoretical Framework

Improvement in education, literacy, health conditions, agency, and equality in developing communities will create "trickle down" effects for eliminating poverty, increasing income over time, and reducing social inequalities. As mentioned earlier, empowerment is defined as the ability to make choices for individuals who were previously denied the ability to do so. Strategic choices include livelihood, where to live, who to marry, whether to have children, freedom of movement, or participation in community or political affairs. More specifically, economic empowerment occurs when individuals' equality and agency is increased following an increase in income. A multi-dimensional view of empowerment provides the theoretical framework necessary to accurately study the impact of microfinance on women's empowerment by defining a set of various indexes to measure outcomes on a holistic scale.

Empowerment can be assessed through dimensions which affect choice, such as resources, agency, and achievements. Resources are categorized as material, such as land, equipment, and working capital, human, such as knowledge and skills, and social, such as relationships and obligations. These resources are usually passed down to the sons of the family in patriarchal societies (Pradesh, 2007). MFIs usually provide credit and savings to individuals without access to material or social resources. Furthermore, agency is defined as the individual's ability to define goals and act upon them (Pradesh, 2007). Agency is harder to define and measure because it is about meaning, motivation, and purpose. Agency can be indirectly measured through increased decision-making power or through an individual's emotional

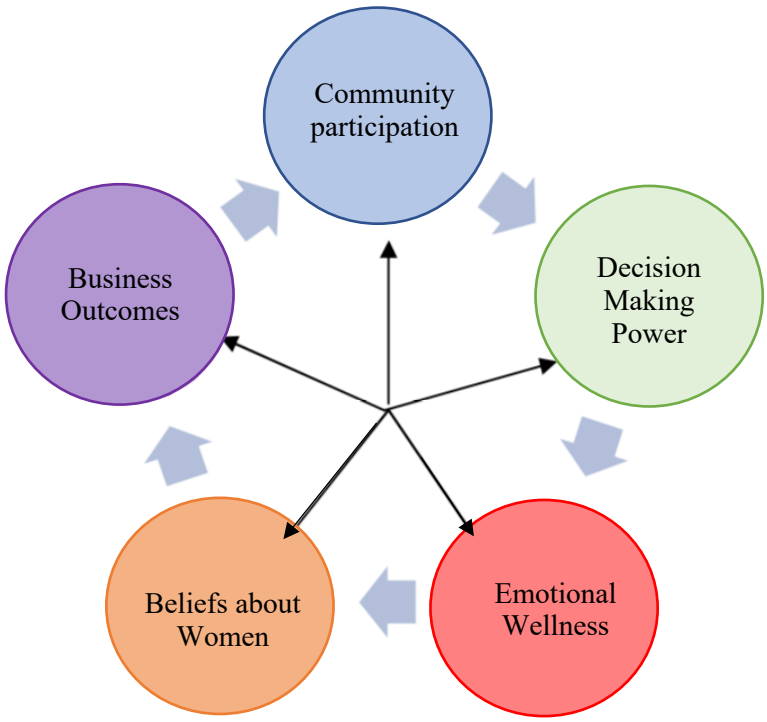
wellness or feelings of confidence/ security in their own abilities, hence two of the indexes used in this paper, decision making power and emotional wellness (Pradesh, 2007).

Empowerment must be acquired by the woman through her active involvement in the development process. However, her social and political environment also influences the economic gains she receives from participating in microfinance programs. The majority of research on microfinance and women's empowerment focuses on the economic empowerment of the woman following an increase in income. However, most studies fail to analyze the impact of microfinance on other dimensions of women's empowerment, such as the social and political dimensions. This paper introduces a community participation index and a beliefs about women index in order to track social and political outcomes that are more heavily influenced by community members, local culture, and tradition. It is important to note that empowerment is not a sum of these individual dimensions but a combination of these dimensions, across economic, emotional, social and political spheres, that are *interlinked and influencing each other*, as seen in Figure 1 below.

Although there is no universal theory for woman's empowerment, grouping together certain variables to form an index on household decision making as well as other indexes that relate to emotional wellness and political participation is necessary. Research on the impact of microfinance on women's empowerment is undecisive thus far, because the literature does not analyze outcomes over a variety of indexes. As a result, certain studies focus on economic empowerment more so than political empowerment, leading to more positive results than studies that look at solely community involvement. It is also important to note that it is easier for researchers to observe the impact of microfinance on health indicators, such as monthly consumption and eating patterns, and on economic indicators, such as level of income, number of businesses operated by the household, and whether the household employs outside labor.

Health and economic indicators are usually the first variables to be impacted by the introduction of microloans and savings in an area. Meanwhile, other indicators within political and social indexes are impacted after a period of time. These indicators are harder to observe and measure directly, and they may not be observed in studies that are not longitudinal. In summary, the purpose of this paper is to close the gap in the literature by looking at the impact of microfinance on women's empowerment in a holistic manner across several dimensions of empowerment.

Figure 1: *Dimensions of Women's Empowerment*



IV. Data

Data was collected from three randomized control trials of the Village Savings and Loan Association (VSLA) program by the CARE NGO in Uganda, Ghana, and Malawi over 22-30 months from 2009-2011. The VSLA model was created by the CARE NGO, and it was modeled after a savings group implemented in Mali where members each contributed a fixed amount in turn for an individual savings amount. VSLA incorporates the same group meeting structure but

allows more flexibility by allowing group members to contribute more than the minimum amount and to take out loans without waiting for their assigned turn. Loans are charged a flat 10% interest rate (significantly lower than the average 21.28% interest rate in rural Uganda) and savings deposited by group members also earn interest (Karlan, 2017). All savings and loan repayments are kept in a locked safe-box monitored by the group. Savings can be withdrawn from the safe-box at group meetings, and loans are withdrawn at predefined cycles. In addition, certain groups may decide to invest in a social or solidarity fund, which is an emergency fund that can be accessed by members as an interest-free loan or cash grant. However, it is important to note that VSLAs do not receive additional capital from outside sources; collective cash increases as individuals accumulate more savings (Karlan, 2017).

The VSLA model was implemented by the CARE NGO and 13 local partners in the study areas. Workers from the NGO administered the program slightly differently in each country. In Ghana, these workers, or field officers, created VSLAs in each village while in Uganda and Malawi, local people in the village were trained to administer the program to surrounding villages. The model in Uganda and Malawi was more sustainable, allowing locals to spread the program themselves resulted in better, more cost-effective program uptake in these countries. Program uptake averaged 31.6% across all three sites (Karlan, 2017).

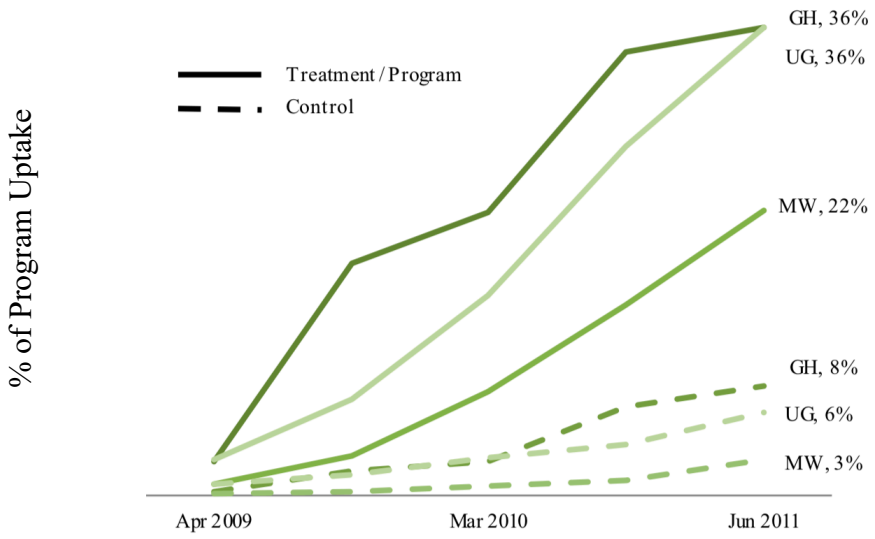
It is important to note differences in the data collected across the three different countries. For example, in Uganda, baseline values represented a standardized count for number of daily meals, while in Ghana the survey did not include data on food borrowing, and in Malawi, the baseline index included skipped meals for children and adults and borrowing to pay for food (Karlan, 2017). Furthermore, in terms of women's empowerment indicators, survey data for community participation and emotional wellness were incomplete for the Ghana and Malawi

sample. As a result, this study only utilizes the data from Uganda in order to conduct a holistic assessment of the impact of microfinance on women's empowerment.

The data results from randomized controlled trials of the VSLA program across a total of 561 clusters. 282 of the clusters were randomly assigned to treatment while the remaining clusters were assigned as a control. The Uganda sample contained 391 villages divided over 196 clusters of primary and secondary villages. In each cluster, 15 households were surveyed in the primary village and 8 households were surveyed in the secondary village. Program uptake across all three countries can be visualized in Figure 2. Uganda had a high program uptake of 36% by 2011 (Karlan 2017).

Village representatives identified adequate households for surveying. Adequate households were defined as households with at least one eligible woman (in the 17 to 50 years old age group, married or not married before). Once a list of adequate households was created, households were randomly selected to participate in surveying. Household questionnaires were administered to the head of the household, usually the husband or the person most knowledgeable about household matters. Baseline surveys were administered to 4,539 households in Uganda.

Figure 2: *Program Uptake Across all 3 Countries (Karlan 2017)*



Four surveys were distributed----(1) the household survey gathered information on income generating activities, gender issues, and community issues, (2) the individual survey was administered solely to women, (3) the village survey gathered information on community characteristics, and (4) the market survey recorded market prices for crops grown by the households (Karlan, 2017). On average, these households report a monthly income of $138.50 USD. Median savings are $38.50; 22% of savings are used for agricultural products, 16% is used for education, and 16% is used for food. The median loan size is $19.70 USD with flat 10% interest on all loans; 29% of loans are used for business, 13% of loans are used for food, and 13% of loans are used for education. Participants could receive a maximum of 10 loans over the sample period (Karlan, 2017).

Below, Table 1 presents summary statistics for women in Uganda who received these loans. Hereafter, the first panel in Table 1 will be referenced to as demographic variables, the second panel as decision making variables (measured 0 for no and 1 for yes), the third panel as financial variables, and the fourth panel as community participation variables. Tables 2 and 3 in the methodology section include further information about how the variables were coded in the data (binary vs. continuous).

Outcomes are measured through proxy indicators, such as business outcomes, decision making power, emotional wellness, and beliefs about women. Data on decision making power includes whether the woman is the primary decision maker on the following house-holding decisions: food expenses, education and healthcare expenses for children, personal healthcare, purchases, and ability to visit friends. Women were asked whether or not they were the primary decision maker on these issues. Panel 2 in Table 1 presents the summary statistics for the decision-making variables, which were coded as 0 for no and 1 for yes.

Table 1*: Summary Statistics*

Variable	Mean	Standard Deviation
Time in VSLA (mo)	13.938	8.925
Age of Participant (yrs)	23.58	17.527
Head_Female	0.038	0.192
Highest Level of Schooling (yrs)	7.321	4.411
Literacy	0.576	0.494
Total Amount Given	39.96	23.598
Food Expenses	0.797	0.402
School Expenses	0.532	0.499
Children's Healthcare Expenses	0.572	0.494
Personal Healthcare Expenses	0.677	0.467
Visit Friend	0.619	0.485
Purchases	0.522	0.499
Financial Data	**Mean**	**Standard Deviation**
Number of Loans	1.486	1.004
Savings Group	0.229	0.475
Monthly Profit for Microenterprises	1.93	21.283
Wage	0.153	0.948
Annual Profit	14230.37	339444.3
Livestock Value	446.241	1076.748
Community Participation	**Mean**	**Standard Deviation**
Raised an Issue to Village Chief	0.417	0.493
Approached Village Chief	0.236	0.425
Attended Community Meeting	0.511	0.499
Spoke in Meeting	0.69	0.462

Furthermore, there is also data on business outcomes and financial inclusion indicators, such as female involvement in savings groups. The financial inclusion indicators also track savings balances, total amount of loans received, and number of loans taken out in the past year. Other indicators in this category include household income, consumption, food security, and asset ownership. The food security index measures food intake reduction, days without eating for adults and children, and a variable which indicates whether the household had to borrow food. Meanwhile, income is aggregated from revenue across agriculture, livestock, business profits (calculated as revenues minus costs), and paid labor, meaning income from outside employment. If a microenterprise was in operation for less than one month, its profits were not included. The correlation between total loans received and monthly profit is .039. Other business outcome indicators include total number of businesses operated by household, time of operation, and

whether or not the household employs outside labor for daily business operations. Panel 3 in Table 1 presents summary statistics on the financial data.

Community participation data captures self-reported involvement in community affairs such as whether the respondent raised an issue before the village chief, government authority or village council, or whether she attended village council meetings or any other village group meetings. The correlation between members who received at least one loan and the frequency which they approach a village chief is .0198. In addition, the correlation between members who received at least one loan and participation in village meetings is .0233. Panel 4 in Table 1 presents summary statistics on community participation data.

Data is also available for the emotional security of the female respondent, such as whether she feels confident in her ability to dictate her own life outcomes. This data is useful in order to understand how VSLA treatment affects a woman's emotional independence and her psychological agency, or ability to believe in herself to make major life decisions and accomplish goals without her husband. However, data is unavailable for use of contraceptives and rates of domestic violence in the treatment versus control areas. More data that could have been helpful is any awareness variables, such as awareness about the minimum legal marriage age and awareness about divorce. This data could reveal how access to credit and savings correlates with better education about women's rights. Better education about women's rights is also highly correlated with the development of an area, so NGOs providing microcredit and savings similar to VSLA can measure the indirect impact of microfinance on the development of an area.

V. Methodology

The purpose of my regression analysis is to compare the treatment group to the control to isolate the effect of microfinance programs within five dimensions of empowerment for women in Uganda. In my regression analysis below, the dependent variable (Y_i) was the women's empowerment and wellbeing proxy indicator *i* regressed on the independent variable, treatedwomenu. Treatedwomenu was a categorical variable for whether women in Uganda received the VSLA treatment or not.

Control variables included head_female, a dummy variable which tracked whether or not the woman was the head of the household. Women were usually the head of the household if they were raising children or responsible for caring for older relatives and extended family without the presence of a husband. Another control variable was the age of the woman. Marital status was split into seven different dummy variables, including monogamous married, polygamous married, separated, divorced, widowed, never married, and cohabitating. These marital status dummy variables allowed for more accurate analysis of how the presence of a husband affected women's empowerment outcomes. Monogamous married was left out of the regression so the other six dummy variables' coefficients could be compared to women who were traditionally married, which represented the majority of the sample.

Finally, schooling_highest was a continuous variable which controlled for the number of years of schooling the woman had. The literacy dummy variable would have controlled even further for education level but was dropped due to multicollinearity. Both regressions were run, one with schooling_highest and another with literacy, revealing that the schooling_highest variable had a more significant regression coefficient. In addition, total loan amount received controlled for differences within microloans between women. The literature discussed previously how the effects of microfinance increase exponentially as total loan amount, number of loans

given, and time in the program increases. However, the variables for the number of loans given and months in the VSLA program were also dropped due to multicollinearity. Total loan amount was included in the regression (instead of the other control variables) because its regression coefficient was more significant than the coefficients for number of loans given and months in the VSLA program when included. Table 2 provides a complete coding of all binary independent variables, shaded in yellow, while Table 3 provides a complete coding of all continuous independent variables, again shaded in yellow.

Regression Analysis

$$Y_i = \alpha + \beta_{1i}\text{treatedwomenu} + \beta_{2i}\text{head\_female} + \beta_{3i}\text{age} + \beta_{4i}\text{polygamousmarried} + \beta_{5i}\text{separated} + \beta_{6i}\text{divorced} + \beta_{7i}\text{widowed} + \beta_{8i}\text{cohabitating} + \beta_{9i}\text{nevermarried} + \beta_{10i}\text{schooling\_highest} + \beta_{11i}\text{total\_amount\_received} + \varepsilon$$

Dependent variables were grouped across five different categories that reflected a holistic view of women's empowerment in developing communities. The first category was decision making (shaded green in Table 3), consisting of categorical variables of whether the woman was the primary decision maker on the following issues: food expenses, school expenses, children's healthcare expenses, personal healthcare expenses, visiting friends/family and purchases. The second category was business outcomes (shaded purple in Tables 2 and 3), consisting of annual profits, ownership of existing businesses, wage, total new businesses created, participation in formal savings, saving at home, and livestock value. The third category was community participation (shaded blue in Tables 2 and 3), consisting of level of participation in women's groups, farmer's groups, burial groups, general community groups, and categorical variables tracking whether or not she attended any community meeting or spoke in any community meeting. The fourth category was emotional wellness (shaded red in Tables 3), consisting of categorical variables that tracked whether she felt that she could make change in the community,

people were willing to help her, and she could react if a neighbor upset her. Finally, the fifth category, beliefs about women (shaded orange in Table 3), consisted of categorical variables that tracked whether she believed there should be equal representation for women or if women should make their own decisions.

Survey questions for categorical variables were asked in the form of yes or no answers, such as, "are you the primary decision maker on this issue," "do you believe that women should have equal representation," or "do you save at home?" Survey questions that tracked degree of participation were asked in the form of "how active are you in this group?" Answers were coded by level of participation, with 1 as the lowest level of participation and 4 as the highest level of participation, as noted in the footnote for Table 2. Separate regressions were run for each dependent variable within the five categories. Regressions for categorical variables were performed using the logit model, since the dependent variable was a 0 or 1. Regressions for continuous variables were run as standard regressions.

Table 2: *Continuous Variables*

Continuous Variables	Value
age	# of years
schooling_highest	# of years
total_amount_received	USD
profits_annual	Ugandan Shillings
wage	USD
livestock value	Ugandan Shillings
total_busnew	# of new businesses
participate_womens	1 through 4
participate_farmers	1 through 4
participate_burial	1 through 4
participate_community	1 through 4

Key:
independent variables
decision making
business outcomes
community participation
emotional wellness
beliefs about women

Note for Community Participation

1= nonactive

2= less active

3= very active

4= extremely active

Table 3: *Binary Variables*

Binary Variables (no=0, yes=1)
treatedwomenu
married
polygamousmarried
separated
divorced
widowed
nevermarried
cohabitating
head_female
decision_food
expenses_school
expenses_health_children
expenses_health_personal
visit_friend
decision_purchases
intro_business
savings_formal
saving_at_home
meeting_attend
meeting_speak
change_community
someone_to_help
react_neighbor
women_deciding
women

Key:
independent variables
decision making
business outcomes
community participation
emotional wellness
beliefs about women

The regression coefficients were predicted to be more positive for the business outcomes category, since microfinance is highly correlated with financial inclusion, through promotion of better access and participation in informal credit and savings groups. In contrast, regression coefficients were expected to be less positive for community participation, since community participation, measured through participation in community groups or ability to talk to a chief or political leader, is not directly associated with microfinance programming. In summary, less positive or even non-significant effects of microfinance on indirect indicators, such as political participation and community involvement, were initially expected.

This is in agreement with the literature, which explains that it takes a longer time to change the political landscape of developing communities. The effect of microfinance on these

indirect indicators depends on the surrounding community members' ability to accept female participation in the community. For example, the female respondent may want to get involved in community groups, but without the acceptance of other community members, she may be prevented from doing so successfully. Meanwhile, more direct indicators about the female respondent, such as income and amount of savings, are not as highly affected by other individuals' perception about women in the area. It is also important to note that the effect of microfinance programming on decision making power is affected by the husband's ability to adapt to changing gender roles within the household. For example, some women may have husbands that are more willing to allow their wife to take control of certain intra-household decisions, while other husbands may be less inclined to allow women to take on the role of primary decision maker within the household. Unfortunately, there was not data collected on the differences between female respondent's husbands and their beliefs, so there is no way to add a control variable for these effects. However, these effects emphasize the importance of separate training for husbands of women that are receiving a microloan, in order to allow for a smoother transition as the woman exits out of traditional gender roles. Unfortunately, the VSLA program did not have separate trainings or education for the husbands of women who took out a microloan in Uganda.

VI. Results

The results are presented across the five dimensions for women's empowerment in a series of tables. Since some of these dimensions included both binary dependent variables and continuous dependent variables, results were grouped into two different tables for some sections. Table A in these sections includes the standard regression analysis of continuous dependent variables, while Table B includes the logit analysis of binary dependent variables. If there is only

one table in a section, such as the decision-making power index below, then that dimension consisted of only binary dependent variables. All logit analysis tables include an odds ratio column, which allows for comparison with standard regression coefficients through percentages of likelihood of that outcome.

1. Decision Making Power Index

In Table 4 for the decision-making power index, treated women were more likely to be the primary decision maker for food expenses, school expenses, children's healthcare expenses, personal healthcare expenses, and purchases. Treated women were 40% more likely to be the primary decision maker on food expenses, compared to a 60% increase in women making decisions for household items, like food, in the Bangladesh study discussed previously in the literature review. Treated women were 32% more likely to be the primary decision maker for school expenses, compared to a 70% increase in women's decision-making power for children's education in the same Bangladesh study. It is important to note that the Bangladesh study included a three-point ranking of decision-making power: women did not participate, women made the decision jointly with their husband, or women made the decision alone. Any improvement from not participating in the decision making to either making the decision jointly or alone was coded as a 1 and 0 otherwise for no improvement. In contrast, my study exclusively analyzes whether or not women are the *primary* decision maker in the household, which could account for why the percentages are lower than the literature after access to microfinance treatment.

Table 4: *Decision Making Power*
(Logit Analysis)
I am the primary decision maker on...

Dependent Variable (Coef.)	Food Expenses	Odds Ratio	School Expenses	Odds Ratio	Children's Healthcare Expenses	Odds Ratio	Personal Healthcare Expenses	Odds Ratio	Visit Friend	Odds Ratio	Purchases	Odds Ratio
treatedwomenu	0.349**	1.40	0.286***	1.32	0.263***	1.30	0.162*	1.17	0.09	1.09	0.362***	1.43
	(0.17)		(0.09)		(0.09)		(0.09)		(0.09)		(0.10)	
head_female	0.685***	1.974	1.022***	2.773	0.958***	2.586	0.891***	2.435	0.611***	1.840	0.647***	1.896
	(0.23)		(0.14)		(0.14)		(0.16)		(0.14)		(0.15)	
age	0.0125*	1.010	0.0170***	1.010	0.0154***	1.010	0.0111***	1.010	0.0155***	1.010	0.0166***	1.010
	(0.01)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
schooling_highest	0.02	1.010	0.0291***	1.020	0.0248**	1.020	0.0220*	1.020	-0.01	0.991	0.0250**	1.020
	(0.02)		(0.01)		(0.01)		(0.01)		(0.01)		(0.01)	
total amount received	0.000768**	1.001	0.000690***	1.001	0.000711***	1.001	0.00136***	1.000	0.000726***	1.001	0.000443***	1.000
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
nevermarried	-1.152**	0.333	-0.180	0.905	-0.276	0.819	0.029	1.020	0.354	1.419	-0.193	0.905
	(0.53)		(0.28)		(0.27)		(0.27)		(0.26)		(0.29)	
polymarried	0.0655	1.062	0.0635	1.062	0.188	1.197	0.419***	1.507	0.280**	1.323	0.176	1.185
	(0.20)		(0.13)		(0.12)		(0.14)		(0.12)		(0.14)	
separated	0.29	1.323	0.464*	1.584	0.424*	1.522	0.39	1.477	0.574**	1.768	0.680**	1.974
	(0.46)		(0.26)		(0.25)		(0.27)		(0.25)		(0.27)	
widowed	0.668**	1.935	0.869***	2.363	0.731***	2.075	0.640***	1.896	1.109***	3.004	0.757***	2.117
	(0.33)		(0.19)		(0.19)		(0.21)		(0.20)		(0.20)	
cohabitating	0.114	1.116	0.275	1.310	0.635	1.878	0.901**	2.460	1.348***	3.819	0.539	1.699
	(0.51)		(0.41)		(0.39)		(0.46)		(0.46)		(0.43)	
divorced	-0.442	0.670	0.753**	2.117	0.956**	2.586	0.965**	2.612	1.164***	3.190	1.301***	3.669
	(0.60)		(0.37)		(0.40)		(0.45)		(0.40)		(0.43)	
constant	0.444	1.553	-1.081***	0.368	-0.786***	0.497	-0.143	0.905	-0.417***	0.670	-1.005***	0.368
	(0.27)		(0.16)		(0.15)		(0.16)		(0.15)		(0.17)	
N	1536		3260		3456		3530		3521		2747	
Adjusted R-Sq	0.0552		0.0964		0.080		0.0658		0.0742		0.0678	

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

My results are consistent with the literature's conclusion that decision-making power increases the most for child-related matters and expenditure decisions. Table 4 indicates that the odds ratios are the highest for decisions about purchases, food expenses, school expenses, and children's healthcare. For all of these decisions, the likelihood that a woman with microfinance treatment was the primary decision maker was over 30%. Another study in Eastern India found that access to microfinance resulted in a 16% increase in women's decision-making power for child related decisions and a 12% increase for expenditure related decisions. In context of this study, my results seem quite large, considering that the Eastern India study looks at increases in women's influence on decision making, whereas my study looks exclusively at women as the primary decision maker.

The impact of treatment on the odds ratio for being the primary decision maker on visiting friends and family was not significant. This could be due to the differences between the decisions and their connection to traditional gender roles. For example, decisions on food, schooling, and children are related to a female's traditional role in the household (making food and taking care of children), and a husband may be more likely to relinquish control on these issues. However, visiting friends and family, which implies essentially leaving the community without the husband's permission, seems like an issue that a husband would be less likely to lose complete control of within developing communities. This result contrasts with the Bangladesh study, which finds that women with access to microfinance treatment are 65% more likely to have more control on decisions to move freely without permission after access to microfinance.

It is also important to note that being the head of the household increased a woman's odds ratio of being the primary decision maker the most of all the independent variables and was significant at the 1% level for all decisions. This result is expected since a woman who is the head of the household does not have a husband preventing her from making these decisions. The

regression was performed again removing women who were single from the sample, yet the coefficients on head_female remained relatively the same. This analysis was performed to ensure that the coefficients on head_female were not inflated, since these women do not have a husband or other primary male authority figure to take decision making power away from them. It is reasonable to assume that odds ratios are still high on head_female because these women are regaining decision making power from other male members of the household, such as fathers, uncles, or grandfathers, who are still traditional patriarchs of the family. This is consistent with the notion that it is significantly easier for women to regain decision making power from older male relatives than it is for traditionally married women to regain decision making power from husbands after access to microfinance.

Both age and schooling marginally increased the odds ratio of her decision-making power, since control in a household is related to seniority and education level. Women who were never married were less likely than married women to be the primary decision maker on all issues, except personal healthcare and visiting friends and family. This could be explained by relatives making house-holding decisions on food and other purchases, while single women retain independence on personal healthcare and mobility. Once a woman gets married, she loses independence for mobility but gains control on important house-holding decisions. This trend could further be explained by a general division of labor once a woman gets married, causing her to have more decision-making power about food, children, and schooling. The likelihood of being the primary decision maker doubles for child related decisions and triples for personal decisions for women who are divorced or widowed, compared to women who are married. This suggests that removal of a husband, when previously there was a traditional marriage, causes a significant increase in decision making power, which is consistent with the literature's claims of husband control in the household.

Finally, the smallest positive increase in the odds ratio was from the total loan amount, which was significant for schooling expenses, children's healthcare expenses, personal healthcare expenses, visiting friends and family, and purchases. This means that with each additional dollar in loans received by the woman, the likelihood that she is the primary decision maker increases by .001% for those decisions. In summary, access to microfinance treatment increased the probability that the woman is the primary decision maker on issues related to the household. This probability increased even more for all issues, within and outside the household, when women were head of the household, divorced, or widowed. Access to schooling, age, and loan amount also marginally increased this probability.

2. Business Outcomes Index

In terms of business outcomes in Table 5A, access to microfinance treatment did not result in a statistically significant increase in annual profits, wage, new businesses created, or livestock value. However, being head of household resulted in an increase in annual profits of 38,082.50 Ugandan shillings, which was 41.89 USD using the 2011 conversion rate.

Table 5A: *Business Outcomes*
(Standard Regression)

Dependent Variable (Coef.)	Annual Profits	Wage	New Businesses	Livestock Value
treatedwomenu	10600.1	0.0157	0.00123	-46.23
	(13348.90)	(0.02)	(0.01)	(34.67)
head_female	38082.5*	0.268***	0.0182*	-271.4***
	(22494.10)	(0.03)	(0.01)	(58.14)
age	756.3	0.000896	-0.000626**	13.79***
	(545.70)	(0.00)	(0.00)	(1.42)
schooling_highest	3617.0**	0.00	0.00	27.93***
	(1405.80)	(0.00)	(0.00)	(3.66)
total amount received	-31	0.0000276	0.0000423***	0.0628
	(20.65)	(0.00)	(0.00)	(0.05)
nevermarried	-52433.3***	-0.0947***	-0.0386***	251.7***
	(15963.60)	(0.02)	(0.01)	(41.57)
polymarried	18802.7	-0.00551	0.0147	280.3***
	(20726.00)	(0.03)	(0.01)	(53.64)
separated	-18791.4	0.0287	0.0210*	38
	(25934.80)	(0.04)	(0.01)	(66.61)
widowed	-18531.3	-0.145***	0.0114	-67.53
	(27458.80)	(0.04)	(0.01)	(70.88)
cohabitating	-17977.9	-0.0497	0.0519**	52.69
	(51595.60)	(0.07)	(0.02)	(134.50)
divorced	97147.9***	-0.0794	0.0202	101.7
	(37415.90)	(0.05)	(0.02)	(97.61)
constant	-20474.7	0.171***	0.0641***	-200.1***
	(21775.70)	(0.03)	(0.01)	(56.84)
N	7645	7635	7722	7660
R-sq	0.005	0.019	0.011	0.03
Standard errors in parentheses				
* p<0.1, ** p<0.05, *** p<0.01				

In addition, being head of the household resulted in a marginal increased daily wage and number of new businesses created. Head_female also resulted in a decrease in livestock value of 271.4 Ugandan shillings, or 29 US cents, which could be explained by the lack of a husband to work with farm animals, since ownership of livestock is passed down to sons of the family in developing communities.

Table 5A shows an increase in annual profits of 3,617 Ugandan shillings or $3.97 USD per year of schooling and an increase in livestock value of 3 US cents per year of schooling. Age also resulted in an increase of 13.79 Ugandan shillings or 1 US cent per year in livestock value. However, age resulted in a small decrease in number of businesses created. In contrast, total loan amount was associated with a marginal increase in number of businesses created per USD given in microloans. These results match the predictions implied by the literature. As a woman's access to capital in greater loan amounts increases, she is able to reinvest this money into creating small microenterprises. In addition, greater education and age means access to accounting, math, and other skills needed to run a profitable business or to manage livestock and agrarian enterprises. However, as age increases, women are less likely to start new businesses and more likely to invest time in existing ventures that they have significant lifetime experience in.

The regression coefficients in Table 5A were used to get an estimate of annual profits from microenterprises managed by married women who received microfinance treatment. The average age in the sample (23.58 years), average total loan amount received ($39.96 USD), and average years of schooling (7.32 years) were plugged in to the regression estimates in Table 5A for the annual profit column. The estimate for annual profit was 53,673.60 Ugandan shillings or $59.04 USD from these microenterprises. This is fairly consistent with the literature, which across Uganda, Malawi, and Ghana found an increase of $66 USD from the microenterprises in the dataset. The average income in the dataset is $1,662 USD per year, meaning that an increase

in income of $59.04 USD from these microenterprises would correlate with a 3.5% increase in total annual income.

It is important to note the significant difference in annual profits from these microenterprises between women who are never married, married, and divorced. Compared to women who are monogamously married, single women are predicted to make 52,433.30 less Ugandan shillings in annual profits, while women who are divorced make 97,147.90 more Ugandan shillings. This difference could be due to single women's lack of a husband to help guide them in managing an enterprise for the first time. In the study in East India, researchers concluded that although women take out the microloan in their own name, husbands still tended to manage the microenterprises funded by their wife's microloans. As a result, access to microfinance treatment in the Eastern India study resulted in a statistically significant loss of managerial control of the microenterprise for women with access to microfinance. Without a husband to help manage the microenterprise, single women in my study made significantly less profit, while divorced women (who were probably already experienced in running a business or other income-generating activity alongside their ex-husband) made more profit from these microenterprises. According to the regression analysis, divorced women in my study would experience a 9.9% increase in annual income from the additional profit from their microenterprises. This percent increase is almost three times as big as the increase in annual income for married women in the sample. The difference between the percentages is mostly accounted by marital status and not by differences in loan amounts or microfinance treatment.

Table 5B: *Business Outcomes*
(Logit Regression)

Dependent Variable (Coef.)	Existing Business	Odds Ratio	Formal Savings	Odds Ratio	Saving at Home	Odds Ratio
treatedwomenu	0.288***	1.334	0.287***	1.332	0.0256	1.026
	(0.08)		(0.11)		(0.07)	
head_female	0.852***	2.344	0.13	1.139	0.659***	1.933
	(0.12)		(0.18)		(0.10)	
age	0.0108***	1.011	0.0137***	1.014	0.00457*	1.005
	(0.00)		(0.00)		(0.00)	
schooling_highest	0.01	1.010	0.122***	1.130	-0.0341***	0.966
	(0.01)		(0.01)		(0.01)	
total amount received	0.000497***	1.000	0.00147***	1.001	0.000915***	1.001
	(0.00)		(0.00)		(0.00)	
nevermarried	-1.273***	0.280	0.448***	1.565	-1.733***	0.177
	(0.16)		(0.14)		(0.11)	
polymarried	0.395***	1.484	-0.114	0.892	-0.0198	0.980
	(0.12)		(0.19)		(0.09)	
separated	0.263*	1.301	-0.232	0.793	-0.529***	0.589
	(0.15)		(0.27)		(0.13)	
widowed	-0.103	0.902	0.187	1.206	-0.463***	0.629
	(0.15)		(0.22)		(0.13)	
cohabitating	0.152	1.164	-0.674	0.510	0.128	1.137
	(0.31)		(0.60)		(0.23)	
divorced	0.347*	1.415	-0.37	0.691	-1.221***	0.295
	(0.21)		(0.44)		(0.22)	
constant	-2.523***		-4.070***		-0.652***	
	(0.14)		(0.20)		(0.10)	
N	7722		6196		7698	
Adjusted R-sq	0.0662		0.1022		0.0861	
Standard errors in parentheses						
* p<0.1, ** p<0.05, *** p<0.01						

In Table 5B, microfinance treatment was associated with a 33.4% increase in the likelihood of owning an existing business and a 33.2% increase in the likelihood of participating in formal savings. This result is higher than the literature for the Mexico study, which found an increase in formal savings of 19%. The literature also finds a decrease in participation in informal savings groups, but Table 5B does not show a statistically significant difference in saving at home after access to microfinance treatment. As total loan amount received increased by $1, the likelihood of saving at home or saving in a formal institution increased marginally by the same small amount for both categories. However, as respondents' age and experience increased as well as their total loan amount, they became more careful with where they stored their savings by choosing to open accounts at formal institutions. Being the head of the household significantly increased their likelihood to save at home, while being single, separated,

or widowed significantly decreased the likelihood of saving at home in comparison to a married woman.

If she was head of the household, the respondent was highly likely to own an existing business, but she was also 93% more likely to save at home instead of in a formal institution. These results are consistent with the literature, since women who are the head of the household are responsible for household income, so they would have a higher wage, create more businesses with microloans, and be more likely to own an existing business. However, without a husband or primary male figure, female heads of household may have trouble accessing formal savings institutions in the community and prefer to save at home. Women who are single, separated, or widowed may rely on male family members or their previous partner's connections in the community to access these institutions.

In summary, the social status of the woman, whether she is married, divorced, single or head of the household, had more of a significant impact on her business outcomes than the VSLA treatment or the total loan amount did. It is reasonable to assume that women who are married rely on their husbands for outside income and are more likely to reinvest their microloan into their children's schooling, healthcare, or other household/consumption expenses. However, women who are divorced or the head of their household have more of an incentive to use their microloan to create a sustainable microenterprise, earn a higher wage, and earn higher annual profits to support themselves and their family.

3. Community Participation Index

Table 6A: *Community Participation*
(Standard Regression)

Dependent Variable (Coef.)	Farmer's Group	Burial Group	Women's Group	Community
treatedwomenu	0.208*	0.0741**	0.0953	0.355*
	(0.12)	(0.04)	(0.21)	(0.20)
head_female	0.16	0.02	0.08	0.24
	(0.16)	(0.05)	(0.37)	(0.37)
age	0.00244	-0.000975	0.000589	0.000274
	(0.01)	(0.00)	(0.01)	(0.01)
schooling_highest	0.0225*	0.01	0.02	0.0476**
	(0.01)	(0.00)	(0.03)	(0.02)
total amount received	0.0000679	0.0000502	-0.000491	0.000557*
	(0.00)	(0.00)	(0.00)	(0.00)
Marital Status Variables	*Yes*	*Yes*	*Yes*	*Yes*
_cons	2.295***	1.956***	3.239***	2.306***
	(0.23)	(0.07)	(0.38)	(0.43)
N	167	1219	21	33
R-sq	0.074	0.016	0.623	0.24
Standard errors in parentheses				
* p<0.1, ** p<0.05, *** p<0.01				

Table 6B: *Community Participation*
(Logit Analysis)

Dependent Variable (Coef.)	Attend Meeting	Odds Ratio	Speak in Meeting	Odds Ratio
treatedwomenu	0.307***	1.350	0.505**	1.649
	(0.08)		(0.20)	
head_female	0.212*	1.234	-0.09	0.919
	(0.13)		(0.23)	
age	0.0192***	1.010	0.0263***	1.020
	(0.00)		(0.01)	
schooling_highest	0.0750***	1.073	0.0707***	1.073
	(0.01)		(0.02)	
total amount received	-0.0000894	1.000	0.00226***	1.002
	(0.00)		(0.00)	
Marital Status Variables	*Yes*		*Yes*	
constant	-0.983***		-0.809**	
	(0.14)		(0.34)	
N	3571		880	
Adjusted R-sq	0.0254		0.0706	
Standard errors in parentheses				
* p<0.1, ** p<0.05, *** p<0.01				

For community participation in Table 6A, microfinance treatment resulted in an increase in participation of 20.8 percentage points for farmer's groups, 7.41 percentage points for burial groups, and 35.5 percentage points for overall general community participation. Schooling also was associated with a marginal increase in participation in farmer's groups and overall general community participation. In Table 6B, treated women, older women, and women with more schooling were more likely to attend and speak in meetings. The highest increase in likelihood in Table 6B was for treated women speaking in meetings, which was a 64.9% increase in likelihood. As education level and age increase, women recognize the value of being engaged with the community that surrounds them. In addition, receiving the VSLA treatment means that women are already engaging with the community by pooling their money together with other members of the community. These interactions may make the women more inclined to attend other community meetings and engage with these members outside of the VSLA setting, where previously this privilege had been denied to them.

4. Emotional Wellness Index

Table 7: *Emotional Wellness*
(Logit Analysis)
I feel that...

Dependent Variable (Coef.)	I can make change in the community	Odds Ratio	People are willing to help me	Odds Ratio	I can react if a neighbor upsets me	Odds Ratio
treatedwomenu	-0.155	0.905	-0.364**	0.695	-0.0248	0.976
	(0.11)		(0.16)		(0.13)	
head_female	0.525***	1.682	-0.14	0.872	0.368**	1.433
	(0.15)		(0.23)		(0.17)	
age	-0.0129***	0.988	-0.00777	0.993	0.00328	1.003
	(0.00)		(0.01)		(0.01)	
schooling_highest	-0.0271**	0.973	-0.03	0.971	0.00	1.003
	(0.01)		(0.02)		(0.02)	
total amount received	-0.000198	1.000	0.0000416	1.000	-0.000014	1.000
	(0.00)		(0.00)		(0.00)	
nevermarried	0.11	1.105	-0.03	0.972	-1.025**	0.368
	(0.29)		(0.48)		(0.49)	
polymarried	-0.228	0.819	-0.0636	0.939	-0.0141	0.986
	(0.16)		(0.23)		(0.17)	
separated	-0.46	0.670	0.45	1.562	-0.43	0.670
	(0.29)		(0.36)		(0.32)	
widowed	-0.253	0.819	0.757***	2.132	-0.187	0.905
	(0.19)		(0.27)		(0.21)	
cohabitating	-0.0901	0.914	0.163	1.177	-0.996**	0.407
	(0.43)		(0.61)		(0.42)	
divorced	-0.412	0.670	1.002**	2.724	-0.427	0.670
	(0.37)		(0.41)		(0.50)	
constant	-0.802***		-1.982***		0.441**	
	(0.18)		(0.25)		(0.22)	
N	3545		3547		1537	
Adjusted R-sq	0.0091		0.0122		0.008	
Standard errors in parentheses						
* p<0.1, ** p<0.05, *** p<0.01						

In terms of emotional wellness in Table 7, women with access to microfinance treatment are 30% less likely to believe that other people in the community are willing to help them. Women who take out microloans to start their own business are likely to discover that others in the community will isolate her for trying to transition out of traditional gender roles and are unlikely to assist her in this transition. This contrasts with the literature for the study in Mexico, which finds that trust in people increases by 4.9 percentage points. Meanwhile, women who are widowed and divorced are significantly more likely to believe that people in the community are willing to help them, probably because community members feel sympathetic to the loss of a husband. Also, in Table 7, older women and women with higher levels of schooling seemed to have a negative outlook on their ability to make change in the community. As women become more educated, experienced, or isolated, they may experience more adversity and become jaded in their ability to overcome institutional obstacles and marginalization within slowly developed communities. This matches with the study in Mexico which also found a decrease in trust in formalized community/ political institutions of 1.1 percentage points for women with access to microfinance. Finally, heads of household are more likely to feel like they can react if a neighbor upsets her. Heads of household are likely more confident in their ability to stand up for themselves, while married women feel the need to have a husband to protect them or are less confident in confronting community members.

5. Beliefs about Women Index

Table 8: *Beliefs about Women*
(Logit Analysis)
I believe in...

Dependent Variable (Coef.)	Equal Representation for Women	Odds Ratio	Women's Rights	Odds Ratio
treatedwomenu	0.478*	1.600	-0.0594	0.943
	(0.26)		(0.21)	
head_female	0.600*	1.822	-0.04	0.959
	(0.35)		(0.32)	
age	0.00678	1.007	-0.00832	0.992
	(0.01)		(0.01)	
schooling_highest	0.05	1.041	0.01	1.005
	(0.03)		(0.03)	
total amount received	0.000171	1.000	0.000115	1.000
	(0.00)		(0.00)	
nevermarried	-1.310*	0.273	-0.04	0.962
	(0.67)		(0.61)	
widowed	-0.863**	0.449	-0.158	0.905
	(0.39)		(0.41)	
Other Marital Status Variables	*yes*		*yes*	
constant	1.873***		-2.890***	
	(0.40)		(0.36)	
N	1513		3547	
Adjusted R-sq	0.0185		0.0032	
Standard errors in parentheses				
* p<0.1, ** p<0.05, *** p<0.01				

In Table 8, for the beliefs about women index, women with treatment were 60% more likely to believe in equal representation for women while heads of household were 82% more likely to believe in equal representation for women. These results are in accordance with the study in Eastern India, which associated microfinance treatment with a 60% increase in women who believed in equal representation. Surprisingly, the VSLA treatment, head of household, and schooling all had no significant effect on beliefs on women's rights, including rights to decision making over her own marital status and voting. The lack of impact here could be attributed to how slowly ideology on women's empowerment and other progressive issues is adopted and integrated into developing communities. Although access to financial resources and schooling should increase beliefs in women empowerment, these changes happen slowly in developing communities where gender roles are so deeply engrained into the culture.

VI. Conclusion

Access to microfinance programs resulted in positive impacts for women's empowerment in the following categories: business outcomes, decision making power, and community participation. Results were most significant and highest in magnitude for business outcomes and decision-making power. It is important to note that the results in these categories were highly influenced by the social status of the participant, particularly whether she was head of household and her marital status. As expected, the effect of microfinance on women's empowerment is negatively affected by the presence of a husband in the household. In contrast, results were less significant for categories such as community participation, emotional wellness, and beliefs about women. This leads to the conclusion that microfinance can more easily impact how a woman behaves within the household (bringing in income or making household decisions) than change how a woman behaves within the community. Community participation, emotional wellness, and beliefs about empowerment are all impacted by the surrounding communities' views on women and whether community members are willing to include more empowered women into their society. Views on women and their role within society are slow to change in developing communities; as a result, effects of microfinance on women's empowerment in categories affected by outside community members are less observable. NGOs or policymakers should consider offering workshops to husbands or other men in the community about women's financial and social inclusion in these communities. Women would be better equipped to transition out of gender roles without the resistance of men in the community. In addition, these trainings could reduce rates of domestic violence and fear for women with access to microloans, which is often reported in the literature. In conclusion, microfinance is an innovative tool for promoting women's empowerment along many dimensions in developing communities, but its

effectiveness would increase significantly through simultaneous education of husbands and other community members.

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