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**Impact Evaluation of Microfinance: Evidence from Sierra
 Leone**

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 and Applications”

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1. Introduction

Presently, BRAC has 30 branches throughout Sierra Leone, and is expanding its development work. Even though their business has been expanding in Sierra Leone, BRAC does not hold any records about the effectiveness of their microfinance services in Sierra Leone yet. This impact evaluation aims to address this knowledge gap. In that sense, the objective of this study is to assess whether clients improve their wellbeing, and are less vulnerable. This study tries to provide an empirical investigation, consisting of surveys, a network analysis and behavioral games, of the group lending scheme of BRAC.

As the current analysis is part of a bigger project, in this paper we address only the issue of the impact of the microfinance service on poverty and vulnerability.

2. BRAC program description¹

BRAC has been operating in Sierra Leone since 2009. Microfinance (MF) programs are group lending programs throughout Sierra Leone where female borrowers are jointly liable for the repayment of their loans. Under joint liability, individuals, in this case women, group together to apply for loans and are jointly accountable for the repayment of the loans.

BRAC has established 30 branches all over Sierra Leone. Each branch has three or four loan officers, each in charge of 250-300 borrowers. A branch has a minimum amount of 800 borrowers. These borrowers live all within a range of 4 kilometers of the branch. When a branch is being established, clientele has to be found. Therefore, the loan officers first visit every potential female borrower in the area of four kilometers to inform them about the lending scheme of BRAC. The requirement for becoming a borrower are:

- The member must be a female
- The member must be aged between 18-50 years
- Only one member from each household can be selected
- The member must have lived in the area for three – five years
- The member must not belong to other MFIs
- Prospects should live within four km from the branch office location
- The member should be living within the boundary of the branch/village/community
- Member should have a business

¹ Overall, section 2 is a summary of Karen van Zaal's previous work.

The potential female borrowers, who are interested and eligible, form groups of four to five females and apply for an individual loan, but as a group. Then the loan officer decides if they are eligible for the loan and if they can enter the program. The small groups, of groups of four to five people, are organized in one big group of 25 to 30 people. These small groups, which form the big group together, consists of females which already knew each other before entering the BRAC's group lending program. They have jointly formed the group and therefore we can assume that certain levels of trust already exist within this small group. The concept of joint liability also accounts only for the small groups, therefore trust and networks are more important in small groups than in the bigger groups.

When everyone is accepted and the big group is constituted, a committee of five people is chosen by all members of the big group. This committee consists of a president, secretary, treasurer and two executive members. Everyone receives a passbook where the amount of the loan, the interest rate and the repayments are being noted. A pass photo of the owner of the passbook is added in the book. Whenever someone loses her passbook, a fine has to be paid. Every two weeks two group members receive a loan. This is based on their behavior, as in defaults of repayment and commitment to the meetings, and on their income performance. The size of the loan differs per member. When a member receives a loan of 20 weeks (five months), the interest rate is 13 per cent, when the loan which is received lasts for 40 weeks (ten months), the interest rate is 25 per cent. In the event that a group member is unable to pay their weekly repayment, consequences will occur. The first time this happens, the other members will pay for the defaulting member. But if it happens frequently, the member will be thrown out of the group and therefore out of the group lending scheme. The loan officer will then choose a new eligible female in the area and this new member will join the small group.

During the weekly meetings, which are held in a place maximum one kilometer from all group members, the repayment of the loan is done and questions can be asked. The president of each small group collects the repayments, and then hands them over to the treasurer and the loan officer of BRAC. As stated above, when someone is unable to repay their loan, the group members of the small group pay the repayment of that person. Due to this arrangement, peer selection and monitoring over each other's peers is an important aspect of the group.

In most urban group lending schemes, the female borrowers own a shop or are street vendors. They tend not to own their own dwelling, but rent them from landowners. In the rural group lending schemes, borrowers tend to engage more in agricultural occupation, but for the most part women own a shop or are street vendors too. They do own their own land and house, because it is cheaper in the rural areas than it is in the urban areas.

3. Research question and theory of change

The research question of interest aims at measuring the effectiveness of BRAC’s microfinance program in Sierra Leone. For that purpose, this document’s research question addresses two main issues: that of poverty outreach of BRAC’s microfinance services (mainly explained by changes in income), and that of vulnerability (i.e. impact on education, food security health, housing, savings, expectations, and food security).

There are several ways in which microfinance activities could have a positive effect on those communities served by the microfinance institution (MFI). Among the available information, the following general areas have been selected to be used as indicators of the potential impact: household income, entrepreneurship, food security and health, savings, and aspirations. The particular dependent variables used to measure the impact of microfinance within each general group are presented in Table 1.

Table 1: Selected impact indicators

Area	Variable	Details
Household income ^a	Total Income	Monthly income of first occupation
	Expected Income I	Expected income per month for the coming year. Simple average of good years and bad years
	Expected Income II	Expected income per month for the coming year, if a GOOD year.
	Expected Income III	Expected income per month for the coming year, if a BAD year.
	Expected Income IV	Expected income for current month
Entrepreneurship	Business plan ^b	Measures the existence or not of a business plan for future projects
Health & Food security	Health I ^c	Measures if people consider their health status as GOOD or lower.
	Food Security	Number of meals per day that the respondent eats
Savings	Savings I ^d	Measures the existence or not of monetary savings
	Savings II ^a	Measures the amount of people's savings
Aspirations	Aspirations I	Measures how high a person finds itself in a scale 1-to-10 when describing the quality of his/her life
	Aspirations II	Measures how high a person expects to find itself (same scale) in 5 years ahead

Notes: ^a Amount in thousands of Leones, unless stated otherwise. ^b Dichotomous variable, equals 1 if the person has a new business plan. ^c Dichotomous variable, equals 1 if the person declares his/her status to be GOOD, and 0 if below this mark. ^d Dichotomous variable, equals 1 if the person has savings.

The causal relationships by which the variables included in Table 1 could reflect a positive impact of BRAC's activities are also numerous. In this document, only the most common are cited.

3.1 Household income

Microfinance in general, and microcredit in particular, tends to stimulate customers business investments. This notion is stronger if the MFI's clients owned a business before obtaining the loan, which exactly the case here. First and foremost, microfinance can help borrowers to adopt newer technologies that will allow them significant increments in productivity. This causal relationship is evident in the case of small farmers who adopt the use of fertilizer, but can also be represented by small industrial/commercial endeavors adopting simple technology (such as a new sewing machine). Larger business investments have also the potential to increase economies of scale, reducing average costs and hence increasing profits. A new line of financing can also materialize highly profitable opportunities that were unreachable before due to the credit constraint. Additionally, the new business investment can also offer improved employment activities to other household members, which could have been unemployed or underemployed/underpaid in the past. Overall, the access to a newer/cheaper source of credit should be reflected by an increase in the household income.

3.2 Entrepreneurship

Microcredit programs can help MFI clients of a MFI starting a new business or expanding an existing one. As the empirical evidence shows, this has the power to increase clients' income and hence assisting them in smoothing their consumption. Nevertheless, this classic channel relies on the entrepreneur potential of the clients. Therefore, one way to measure the presence of a positive impact of BRAC's program will be to measure if there is an increase in the levels of entrepreneurship among clients.

3.3 Health and food security

Poor households are hit at different levels, many of them interconnected. This poses the threat of reinforcing the negative effects of poverty. Health-shocks are a clear example of this. Poor households not only lack the resources to afford expensive medical treatment, but they also lack enough resources for decent meals. Unnourished households are not only prone to get sick more often, but they are also less productive, which ultimately feeds back into the system by reducing their income generating ability even further. There is plenty of evidence in the literature of a positive impact of microfinance on the health of the clients, and on the quantity and quality of the food they consume. If the use of microcredit has increased clients' income, they can now use a portion of the extra money to increase their expenditure in health products or services, and in more or better food. Additionally, if participation in the microcredit program has reduced income volatility, this will also be reflected in a

smoother (more healthier) pattern of food consumption. Alternatively, they can also use part of the initial loan for the same purposes. Finally, it is also stated in the literature that female clients give priority to investment/consumption in social-development factors such as health, food, and education.

3.4 Savings

Even the poorest households save some money for emergency situations. In general, poor people do save by reserving small amounts of cash to respond to income or health shocks. Nevertheless, the amount and/or quality of these savings is generally too low to generate a radical change in their living conditions. These small amounts of savings are most of the time complemented by entering reciprocal emergency lending relationships with relatives, friends and/or neighbors, which ultimately has a cost in terms of social tensions among actors. In other cases, the local moneylender can also step in to assist the household in need, but the high cost of this source of finance in many cases tends to solve one problem by exacerbating others. Microfinance in general, and microcredit in particular, can reduce the dependency on these expensive and irregular sources of insurance. In BRAC's case, if the program has been effective in stabilizing income and/or generating a higher household earnings, this could be revealed by an increase in the proportion of households that declare to have cash savings, as well as by a surge in the amounts saved. Higher savings makes clients of the MFI less dependent on these informal, more expensive mechanisms of insurance, further increasing household long-term income and reducing uncertainty.

3.5 Aspirations

Women's aspirations can be a clear reflection of their level of empowerment. In Sierra Leone, as in many other developing countries, women have a subordinated role relative to their husbands. Most of the time, this cultural bias is exacerbated by, among other limitations, women lacking any assets, sources of income, and access to education. In this context, not only women's decision-making power within the household is very small; the fact of women being poorer and less educated than men hampers their ability to influence the policymaking process at the village level. Altogether, these factors explain some of the reasons for women in many developing countries to play a subordinate role. Additionally, these factors explain the empirical evidence of women showing lower levels of self-confidence in comparison to men.

Microfinance has the power to change this. By taking part in BRAC's group-lending program, female clients can start their own business and start generating their own income. The outcome of this is not only reducing poverty by means of the new income, but also providing women with a higher bargaining power within their households. If successful, microfinance should allow women becoming more independent of their partners. Additionally, the group-lending scheme also provides these women with the opportunity to interact socially with other people in their village, hence reinforcing

their social networks and helping them to accumulate social capital. If the group or the MFI play an active role in the village, then female clients would also have found a way to influence the village's policymaking process. In conclusion, by helping women to become more socially and economically active in their communities, microfinance has the potential to raise their self-esteem and confidence levels. If so, this should be reflected in a change in these women's aspirations.

4. Research design

The total amount of microfinance borrowers of BRAC in Sierra Leone is approximately 28,000 members divided over 30 branches. For the analysis eight of these 30 branches were randomly selected. Additionally, groups of respondents were randomly selected within and around each branch (inside and outside the 4 kilometer limit). The first group of respondents is a collection of households who have access to BRAC loans (inside), but who do not want to participate in the microfinance program (C1). A second group includes those households who are located outside of the 4 kilometer radius, and hence do not have access to BRAC loans (C2). Both groups are used as control groups throughout our analysis. Finally, an additional group consisting of those households able and willing to get a loan is considered (T1, or treatment). Total sample size including treatment and control group amounts 1,259 observations.

In this context, both the household inside the radius (C1+T1) and the households not allowed to borrow because located outside the radius (C2) were surveyed. The survey includes a range of questions capturing socio-demographics and several outcome variables (i.e. income, housing, health, food security, consumption and risk). Unfortunately, the baseline data collected earlier in 2010 by BRAC cannot be used, which is due to: the mobility of respondents; the merging of branches; the lack of keeping track of borrowers who completed or left their group, along with little identification data of borrowers. Therefore, this analysis will make use only of endline data available to us.

An additional limitation to the scope of our analysis is posed by the fact of the intervention being implemented before the design of the study, making a randomization of the treatment and control groups impossible. As was explained to us, the interviews to the outside control group C2 were conducted only on households who were interested in obtaining a loan from BRAC. If so, this implies that the control group outside of the 4 kilometer radius suffers from self-selection problem. This lack of randomness makes almost impossible to implement a traditional *double difference* approach in a panel setting. However, following Coleman (1999) we are able to implement a *double difference* approach in a cross-section setting. Yet, it should be noted that based on the set-up of the study, only people who are interested in obtaining microfinance were surveyed outside the radius (C2). Therefore, by design we are missing an outside group who are not interested in a microfinance loan. This fact

entails that, the difference between those who want to borrow and those who do not want to borrow is captured by individuals within the area where BRAC operates.

4.1 Coleman's procedure

In our analysis we follow the alternative empirical specification proposed by Coleman (1999). This approach is possible due to the existence of the additional control group (C2), which includes the households who do not have access to BRAC loans but who are interested. Coleman's procedure to account for the selection bias can be represented by the following expression:

$$Y_{ij} = X_{ij}\alpha + D_j\beta + M_{ij}\gamma + T_{ij}\delta + \vartheta_{ij}$$

Where :

Y_{ij} - outcome on which impact is measured (i.e. income, savings, health etc.)

X_{ij} - vector of household characteristics (includes a constant)

D_j – vector of branch dummies, $j=1, 2, \dots, 8$

M_{ij} – dummy variable equal to 1 if the household ij self-selects into the credit program, 0 otherwise

T_{ij} - dummy variable equal to 1 if the self-selected member has gained access to the microfinance program, 0 otherwise.

ϑ_{ij} – error term

In his approach, Coleman argues that M_{ij} controls for selection bias so that the coefficient on T_{ij} , represented by δ , is a consistent estimate of the causal treatment effect.

4.2 Confirmatory logit model

Coleman's approach makes the assumption that the control group outside the treatment area C2² would, on average, share the same characteristics as the treatment group T1 who already benefited from the credit. Even though it is not possible to compare the two groups on the unobservable characteristics, we compared the two groups based on the observable characteristics to see if they are as similar as assumed. In order to do so, we used the logit model to predict the probabilities for the outside control group (C2) based on the estimates of the treatment group and control group who had access to microfinance (T1+C1)

$$y_i = \beta_0 + \beta_1 \text{age}_i + \beta_2 \text{educ}_i + \beta_3 \text{tribe}_i + \beta_4 \text{relig}_i + \beta_5 \text{child}_i + \beta_6 \text{ocup}_i + \eta_{ij}$$

Where,

² Those who are interested in the credit programme, but do not have access to it.

y_i - dummy variable, 1 for those who participate in the microfinance program, and 0 for those who do not participate, but have access to microfinance

age_i – age of the person i

$educ_i$ – education i

$tribe_i$ – tribe to which a person i belongs

$relig_i$ – religious affiliation of the person i

$child_i$ – number of children in the household of the person i

$ocup_i$ – type of the occupation of the person i

η_i – error term person i

It is a standard procedure that if the predicted probabilities of the control group C2 are close to 0.5 or above, then it is possible to assume that the observable characteristics of C2 and the treatment group are indeed similar. In this case, our analysis shows that observable characteristics of the control group C2 are indeed very similar to those of the treatment group. The lowest predicted probability of the group C2 is 45.6%, and only a total of 2 observations presented probabilities below 50%.³ Therefore we can assume that there are no significant differences in observable characteristics between treatment and control members (C2), and hence Coleman's procedure is still recommended.

Additional information regarding the characteristics of each group of interest (T1, C1 or C2) is available in Table 2, which presents statistics for the main variables considered in this document sorted by group. It is important to point out that, for the expected income in the good and bad year we have assumed equal chance of next year being a good ($p=0.5$) or a bad year ($p=0.5$). In reality, it could also be the case that the program is affecting these probabilities.

³ Representing 1,1% of the subsample.

Table 2: Descriptive statistics of main variables by group (T1, C1, and C2)

Treatment T1 (inside)					
Variable	Mean	Obs.	Std. Dev.	Min	Max
Age	34.3	488	8.5	18.0	66.0
Nr. of Children	4.3	815	2.4	1.0	20.0
Monthly Income (stated) ^a	421,449	772	512,616	-	5,600,000
Exp. Income II (Good) ^a	698,074	752	962,642	240	8,400,000
Exp. Income III (Bad) ^a	324,905	757	592,353	3,000	5,000,000
Exp. Income IV (next month) ^a	491,945	759	609,331	380	5,000,000
NewBusiness ^b	0.39	822	0.5	0.0	1.0
HealthStatus ^b	0.54	817	0.5	0.0	1.0
# of Meals	2.3	814	0.6	1.0	4.0
TotSavings ^a	604,810	656	848,728	100	5,600,000
SavingBehavior ^b	0.8	811	0.4	0.0	1.0
Aspiration (status now)	5.1	819	1.8	1.0	10.0
Aspiration (5 Years)	9.4	819	1.5	1.0	10.0
KnowsMicrof. ^b	0.71	268	0.5	0.0	1.0
KnowsMicrof.II* ^b	0.24	817	0.4	0.0	1.0
LoanOutstand. ^b	0.47	823	0.5	0.0	1.0

Control C1 (inside)					
Variable	Mean	Obs.	Std. Dev.	Min	Max
Age	32.5	206	8.0	19.0	50.0
Nr. of Children	3.3	198	2.1	1.0	13.0
Monthly Income (stated) ^a	462,939	195	552,924	20,000	4,000,000
Exp. Income II (Good) ^a	645,208	183	681,506	1,000	6,000,000
Exp. Income III (Bad) ^a	319,278	180	560,441	10,000	5,000,000
Exp. Income IV (next month) ^a	435,451	175	392,271	4,000	2,100,000
NewBusiness ^b	0.32	207	0.5	0.0	1.0
HealthStatus ^b	0.63	205	0.5	0.0	1.0
# of Meals	2.3	203	0.6	1.0	3.0
TotSavings ^a	571,994	170	728,551	4,000	5,300,000
SavingBehavior ^b	0.8	206	0.4	0.0	1.0
Aspiration (status now)	4.9	179	1.4	1.0	9.0
Aspiration (5 Years)	9.4	179	1.4	3.0	10.0
KnowsMicrof. ^b	0.66	65	0.5	0.0	1.0
KnowsMicrof.II ^b	0.21	207	0.4	0.0	1.0
LoanOutstand. ^b	0.05	207	0.2	0.0	1.0

Control C2 (outside)					
Variable	Mean	Obs.	Std. Dev.	Min	Max
Age	32.1	203	8.0	17.0	50.0
Nr. of Children	3.1	196	1.5	1.0	9.0
Monthly Income (stated) ^a	445,834	193	526,727	2,000	4,000,000
Exp. Income II (Good) ^a	603,750	188	524,000	10,000	5,000,000
Exp. Income III (Bad) ^a	249,775	187	341,480	2,000	4,000,000
Exp. Income IV (next month) ^a	391,098	179	346,442	1,500	2,400,000
NewBusiness ^b	0.36	202	0.5	0.0	1.0
HealthStatus ^b	0.63	201	0.5	0.0	1.0
# of Meals	2.2	201	0.5	1.0	3.0
TotSavings ^a	658,037	164	869,647	5,000	5,300,000
SavingBehavior ^b	0.8	203	0.4	0.0	1.0
Aspiration (status now)	5.1	187	1.4	1.0	9.0
Aspiration (5 Years)	9.3	187	1.5	4.0	10.0
KnowsMicrof. ^b	0.71	59	0.5	0.0	1.0
KnowsMicrof.II ^b	0.25	203	0.2	0.0	1.0
LoanOutstand. ^b	0.07	203	0.3	0.0	1.0

Notes: ^a Amount in Leones. ^b Dummy 0/1 .

5. Results and analysis

In this section, we use a 5% significance level to establish if the obtained coefficients are statistically different from zero. The first variables to be considered which measure the potential impact of the program are household income and expected income. Table 3 presents the main results⁴. As it can be seen, the treatment does not seem to generate a positive impact on current levels of income. The type of tribe this person belongs to, and the sort of work he does are more powerful variables when it comes to explain the sources of variation of current income. On the other hand, a positive impact of the microcredit program is found when the focus is set on expected income. Obtaining the loan has increased the average expected income for next year in 102,8 thousand Leones per month when controlling for the other variables. The fifth column in Table 3 shows that this positive impact on next year's income is particularly true when the client's answer is referred to a "bad" year. Negative expectations regarding next year's income have improved significantly due to participation in BRAC's program. As stated in the last column of the same table, the improvement is not affecting only outcomes 12 months in the future, but also in the short-term. The treatment generates a positive impact of 105 thousand Leones in the amount of income expected for the current month, *ceteris paribus*.

⁴ The tables including the complete set of variables are presented in the appendix.

Table 3 : Impact of treatment on current and expected monthly income

Independent variables	Dependent variables ^a				
	Monthly Income (stated)	Expectations			
		Exp. Income I (average)	Exp. Income II (Good)	Exp. Income III (Bad)	Exp. Income VI (next month)
Treatment	-46.63 <i>0.36</i>	102.87 <i>0.04</i>	110.53 <i>0.18</i>	100.54 <i>0.02</i>	105.07 <i>0.02</i>
M	24.86 <i>0.66</i>	-71.26 <i>0.16</i>	-70.09 <i>0.33</i>	-72.61 <i>0.09</i>	-26.10 <i>0.52</i>
Age	0.51 <i>0.83</i>	-1.19 <i>0.65</i>	-3.29 <i>0.40</i>	1.38 <i>0.53</i>	2.48 <i>0.34</i>
Education	19.34 <i>0.07</i>	-4.54 <i>0.65</i>	-14.26 <i>0.30</i>	6.41 <i>0.60</i>	5.05 <i>0.58</i>
Tribe	20.85 <i>0.02</i>	12.02 <i>0.24</i>	28.52 <i>0.11</i>	-4.09 <i>0.42</i>	21.09 <i>0.02</i>
Religion	24.88 <i>0.58</i>	-32.62 <i>0.55</i>	-25.11 <i>0.76</i>	-46.61 <i>0.46</i>	-22.52 <i>0.61</i>
Nr. of Children	12.94 <i>0.14</i>	23.18 <i>0.01</i>	31.21 <i>0.02</i>	15.30 <i>0.02</i>	17.65 <i>0.07</i>
Occupation	21.88 <i>0.00</i>	16.72 <i>0.01</i>	22.96 <i>0.02</i>	12.46 <i>0.01</i>	47.27 <i>0.00</i>
Constant	260.29 <i>0.08</i>	397.30 <i>0.04</i>	609.59 <i>0.05</i>	177.93 <i>0.39</i>	15.87 <i>0.92</i>
Number of observations	728	698	703	700	675

Notes: ^a Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics. Total Income= Monthly income of first occupation; Expected. Income I= Exp. average monthly income for next year (simple average of good and bad year); Exp. Income II= Exp. monthly income for next year, if a GOOD year; Exp. Income III= Exp. monthly income for next year, if a BAD year; Exp. Income IV= Exp. income for current month.

Nevertheless, for a proper understanding of the real impact of the variables Expected Income I, II, and III, we would need the effective probabilities assigned by each individual to each particular outcome (Good versus Bad year). Overall, it can be said that receiving a microcredit from BRAC has not improved clients' current income⁵, but it has had a positive impact in these people's expectations. This is particularly true when measured using "Exp. Income III", giving the idea that perhaps BRAC's microfinance activities could be having the same effect as an insurance (at least under clients' perspective).

⁵ The time elapsed between the moment at which this people received the loan and the time at which the data has been gathered is different for each client, and has not been specified in the dataset.

Additionally, we would like to investigate if customers' knowledge of other microfinance organizations' lending activities in the region could have an effect on the results. In order to test for this potential influence, we have included a new variable "*KnowsMicrofin*" in the original model (section 4.2). This control variable is a binary variable, which takes a value of 1 if the person has knowledge of other microcredit program (other than BRAC's). It is important to stress, that the small sample size is due to the fact that, the control variable "*KnowsMicrofin*" is obtained from a subsample of respondents. More specifically, this subsample only includes respondents who actually know any specific type of other NGO's activities. Table 4 presents the main results. In addition to that, Table 4*A in the appendix offers the results of the regression including "*KnowsMicrofinIP*", which is a binary control variable which takes a value of 1 if the person has knowledge of other NGOs' microfinance activities, and 0 in all other cases, independently of having previous knowledge of other NGOs' activities (i.e., it considers the whole sample). This last approach, the inclusion of "*KnowsMicrofinIP*", has almost no impact on the results of Table 3. This result is also observable with the other potential impact indicators, and therefore the present analysis will only focus on the original approach and on the alternative one with the smaller sample ("*KnowsMicrofin*").⁶

Furthermore, we are interested to see if the fact that someone in the household, other than the respondent, has loans outstanding could affect the result of our analysis. In order to do so, a different control variable, "*loanoutstand*", is included in the original model. The control variable "*loanoutstand*" is a binary variable that takes value of 1 if someone in the household (other than the client) has loans outstanding. However, in this alternative case no statistically significant results for the treatment were found, see Table 4**A in the appendix.

⁶. The tables in the appendix presenting the results of including "*KnowsMicrofinIP*" are indicated by one asterisk in their number. Tables in the appendix presenting the results of including "*loanoutstand*" are indicated by two asterisk in their number.

Table 4: Impact on current and expected income – Knowledge of MFI included as control

Independent variables	Dependent variables ^a				
	Monthly Income (stated)	Expectations			
		Exp. Income I (average)	Exp. Income II (Good)	Exp. Income III (Bad)	Exp. Income VI (next month)
Treatment	16.18 <i>0.86</i>	100.54 <i>0.27</i>	71.35 <i>0.59</i>	139.74 <i>0.05</i>	135.57 <i>0.10</i>
M	-17.19 <i>0.86</i>	-47.36 <i>0.60</i>	43.81 <i>0.72</i>	-127.91 <i>0.06</i>	-10.37 <i>0.89</i>
Age	7.74 <i>0.19</i>	6.15 <i>0.25</i>	12.90 <i>0.09</i>	0.70 <i>0.86</i>	6.72 <i>0.25</i>
Education	34.77 <i>0.15</i>	-14.93 <i>0.37</i>	-7.43 <i>0.76</i>	-18.11 <i>0.17</i>	-11.70 <i>0.44</i>
Tribe	-16.28 <i>0.35</i>	-10.96 <i>0.34</i>	-18.07 <i>0.28</i>	-4.07 <i>0.63</i>	21.45 <i>0.12</i>
Religion	-86.27 <i>0.36</i>	2.27 <i>0.98</i>	58.56 <i>0.54</i>	-100.26 <i>0.37</i>	15.78 <i>0.85</i>
Nr. of Children	-2.23 <i>0.89</i>	-15.32 <i>0.39</i>	-17.89 <i>0.49</i>	-7.27 <i>0.55</i>	6.25 <i>0.71</i>
Occupation	16.95 <i>0.26</i>	0.33 <i>0.97</i>	-5.11 <i>0.71</i>	6.45 <i>0.38</i>	47.50 <i>0.00</i>
KnowsMicrofin.	15.27 <i>0.82</i>	127.20 <i>0.22</i>	197.72 <i>0.18</i>	60.13 <i>0.41</i>	130.24 <i>0.03</i>
Constant	530.29 <i>0.09</i>	564.17 <i>0.14</i>	562.66 <i>0.32</i>	357.71 <i>0.22</i>	-124.96 <i>0.67</i>
Number of observations	212	195	197	197	182

Notes: ^a Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics. Total Income= Monthly income of first occupation; Expected Income I= Exp. average monthly income for next year (simple average of good and bad year); Exp. Income II= Exp. monthly income for next year, if a GOOD year; Exp. Income III= Exp. monthly income for next year, if a BAD year; Exp. Income IV= Exp. income for current month.

When considering only the subsample of respondents who indeed had knowledge of the other microfinance organizations⁷, the coefficient for the treatment is no longer significant for next year's average expected income (3rd column). Yet, other variables still show the presence of the program's positive impact on clients' expectations. When the measurement is made using expected monthly income for next year, when it is a "bad" year (Exp. Income III), then the impact of BRAC's program increases almost 30%. In the short-run the treatment has also a positive impact, but only if allowing for a 10% significance level.

⁷ We assumed that information on whether the respondent has had contact with another microfinance organization is summarized in the variable "KnowsMicrofin".

Table 5: Impact of treatment on entrepreneurship

Independent variables	Dependent variables	
	Business Plan ^a	Business Plan ^{a b}
Treatment	0.018 <i>0.70</i>	0.115 <i>0.12</i>
M	0.06 <i>0.22</i>	-0.09 <i>0.29</i>
Age	-0.004 <i>0.10</i>	-0.007 <i>0.06</i>
Education	0.015 <i>0.12</i>	0.012 <i>0.43</i>
Tribe	-0.012 <i>0.13</i>	0.002 <i>0.85</i>
Religion	-0.033 <i>0.45</i>	-0.072 <i>0.39</i>
Nr. of Children	0.005 <i>0.60</i>	0.010 <i>0.56</i>
Occupation	0.011 <i>0.14</i>	0.036 0.01
KnowsMicrofin.	-- --	-0.131 0.07
Constant	0.350 0.02	0.619 0.02
Number of observations	766	216

Notes: ^a Dummy variable, equals 1 if the person has a new business plan. ^b Includes the dummy “*Knowledge of Microfinance*” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

The second variable used to evaluate the potential impact of BRAC’s loans is entrepreneurship. This variable is just a dummy, which takes a value equal 1 if the client has a new business plan. Table 5 presents the results of both the original approach and the alternative including “*KnowsMicrofin*”, which –to remind the reader- only accounts for the subsample of respondents who had knowledge other NGOs’ activities. In the original approach (first column), we cannot find any impact of the program. In this case, other explanatory variables⁸ and the constant term seem to capture all the variability. The results derived from the subsample do not alter this conclusion, although the coefficient of the treatment variable has clearly increased in magnitude and shows a lower p-value. This alternative approach reduces the sample to 216 observations.⁹

⁸ Such as age, if we allow for a 10% significance level. See Table 5A for the complete set of regressors.

⁹ See Table 5*A, for the full sample results including “*KnowsMicrofinII*” as a control variable.

Additionally, when using “*loanoutstand*” as a control variable to assess the effect of the microfinance program on the entrepreneurship (Table 5**A, appendix), as in the case of expected income, no significant treatment effects were found.

Table 6: Impact of treatment on health

Independent variables	Dependent variables	
	Health I ^a (declared status)	Health II (# of meals)
Treatment	-0.011 <i>0.85</i>	0.070 <i>0.15</i>
M	-0.093 <i>0.11</i>	-0.048 <i>0.35</i>
Age	-0.002 <i>0.41</i>	-0.007 0.00
Education	0.011 <i>0.32</i>	0.003 <i>0.78</i>
Tribe	0.024 0.01	0.006 <i>0.40</i>
Religion	0.006 <i>0.90</i>	-0.129 0.00
Nr. of Children	0.021 0.05	-0.007 <i>0.47</i>
Occupation	0.012 <i>0.08</i>	0.020 0.00
Constant	2.210 0.00	0.803 0.00
Number of observations	760	763

Notes: ^a Dummy variable, equals 1 if the person declares her status to be GOOD, and 0 if worst. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

The third variable considered is health. In particular we use two variables that are assumed to reflect how healthy the client is: self-assessed health status, and the number of meals that the respondent eats per day. Table 6 presents the result for the original approach. In this case, the coefficients for “*treatment*” do not provide any sign of an impact.

Table 7 contains the same analysis but including “*KnowsMicrofin*” variable. In this case, the results are more in line with the proposed theory of change. In particular, client’s daily number of meals eaten seems to have significantly increased due to the program. On average, for the people in the

subsample who knew about other microfinance programs, the number of meals increases by more than a quarter of a meal (second column).

Table 7: Impact of treatment on health - Knowledge of MFI included as control

Independent variables	Dependent variables	
	Health I ^a (declared status)	Health II (# of meals)
Treatment	0.040 <i>0.62</i>	0.275 <i>0.00</i>
M	-0.065 <i>0.49</i>	-0.181 <i>0.06</i>
Age	0.000 <i>0.96</i>	-0.003 <i>0.50</i>
Education	0.017 <i>0.31</i>	-0.010 <i>0.63</i>
Tribe	0.014 <i>0.27</i>	0.014 <i>0.33</i>
Religion	0.114 <i>0.09</i>	-0.113 <i>0.20</i>
Nr. of Children	0.048 <i>0.01</i>	-0.024 <i>0.22</i>
Occupation	-0.009 <i>0.47</i>	0.025 <i>0.02</i>
KnowsMicrofin.	-0.170 <i>0.03</i>	-0.196 <i>0.02</i>
Constant	1.887 <i>0.00</i>	1.202 <i>0.00</i>
Number of observations	214	216

Notes: ^a Dummy variable =1 if the person declares her status to be GOOD, and =0 if worst. Includes the dummy “*Knowledge of Microfinance*” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Another tools used to reveal the lending program’s efficiency are two variables related to savings. The variable “*Savings I*” intends to show people’s saving behavior (if they save or not), and the variable “*Savings II*” the amount that the clients have saved. Unfortunately, neither one nor the other approach presented significant results.

Table 8: Impact of treatment on savings

Independent variables	Dependent variables	
	Savings I ^a (saving behavior)	Savings II ^b (amount saved)
Treatment	0.047 <i>0.18</i>	-14.69 <i>0.88</i>
M	-0.002 <i>0.97</i>	129.33 <i>0.18</i>
Age	-0.001 <i>0.55</i>	-2.54 <i>0.58</i>
Education	0.008 <i>0.24</i>	13.02 <i>0.49</i>
Tribe	0.008 <i>0.10</i>	22.30 <i>0.15</i>
Religion	-0.031 <i>0.31</i>	-35.27 <i>0.68</i>
Nr. of Children	0.000 <i>0.98</i>	3.62 <i>0.81</i>
Occupation	0.001 <i>0.79</i>	-0.302 <i>0.98</i>
Constant	0.705 <i>0.00</i>	434.76 <i>0.08</i>
Number of observations	764	638

Notes: ^a Dummy variable =1 if the person declares to save money. ^b Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 9: Impact of treatment on savings - Knowledge of MFI included as control

Independent variables	Dependent variables	
	Savings I ^a (saving behavior)	Savings II ^b (amount saved)
Treatment	0.015 <i>0.75</i>	-26.40 <i>0.91</i>
M	-0.024 <i>0.69</i>	351.88 <i>0.12</i>
Age	0.001 <i>0.81</i>	-3.83 <i>0.77</i>
Education	-0.009 <i>0.48</i>	34.7 <i>0.53</i>
Tribe	0.003 <i>0.67</i>	-0.97 <i>0.97</i>
Religion	-0.039 <i>0.39</i>	-91.3 <i>0.71</i>
Nr. of Children	0.010 <i>0.44</i>	-33.2 <i>0.36</i>
Occupation	0.000 <i>0.99</i>	-45.8 <i>0.07</i>
KnowsMicrofin.	-0.010 <i>0.82</i>	-330.8 <i>0.08</i>
Constant	0.932 0.00	1,127.5 <i>0.14</i>
Number of observations	216	196

Notes: ^a Dummy variable =1 if the person declares to save money. ^b Amount in thousands of Leones. . Includes the dummy “*Knowledge of Microfinance*” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Finally, the last variables used to measure BRAC’s lending program efficiency are two indicators of clients’ aspirations. The first column in Table 10 presents the results of measuring people’s current aspirations (scale 1 to 10; the higher value, the better). The second column presents the results of measuring how people picture themselves in 5 years from now (same scale). Unfortunately, neither one nor the other approach presented significant results.¹⁰

¹⁰ Table 11A in the appendix presents the results of including “Knowledge of Microfinance” in the model.

Table 10: Impact of treatment on aspirations

Independent variables	Dependent variables ^a	
	Aspiration I (current)	Aspiration II (future)
Treatment	0.018 <i>0.90</i>	0.069 <i>0.67</i>
M	0.226 <i>0.11</i>	-0.134 <i>0.42</i>
Age	0.008 <i>0.24</i>	0.002 <i>0.72</i>
Education	0.075 0.01	0.019 <i>0.52</i>
Tribe	-0.014 <i>0.51</i>	0.007 <i>0.78</i>
Religion	0.333 0.01	0.173 <i>0.22</i>
Nr. of Children	0.046 <i>0.12</i>	0.013 <i>0.63</i>
Occupation	-0.021 <i>0.26</i>	-0.022 <i>0.19</i>
Constant	3.743 0.00	9.535 0.00
Number of observations	726	726

Notes: ^a Aspirations is measured by a scale 1 to 10, in which 10 represents the maximum level of aspirations. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

6. Limitations

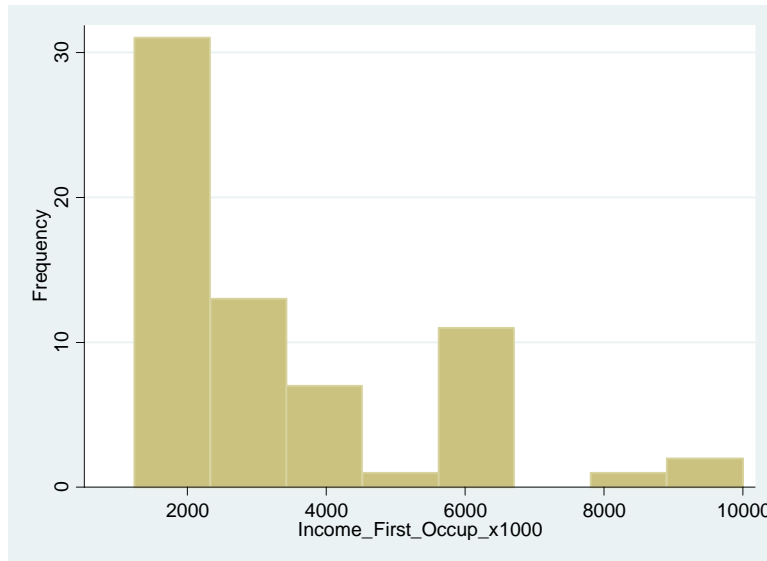
Throughout the analysis several limitations were faced. The first one is the reduced amount of observations available per group (treatment and control) and per branch. This particular problem is evident when considering the variable “age” for which only 897 observations are available from a total of 1,259 in this database. The treatment group (T1) seems to be the most affected by this problem, showing 42% of cases for which “age“ was not present.

Outliers posed an additional challenge. In particular, variables related to income and expected income presented a clear problem. In some cases, outliers are easily identified, but in other cases the amount

of observations with extreme values have led us to think that the BRACS sample might be biased somehow.

According to the U.S. Department of State and the World Bank¹¹, per capita national income in Sierra Leone is U\$340, or U\$28 per month. In our sample, from 1,174 persons who provided the amount of their first occupation’s income, 945 (80.5%) were above this threshold. Furthermore, more than 7% declared to have monthly income above 10 times this threshold (Figure 1). In a country in which around 70% of the population lives with less than U\$1 per day, this fact looks implausible.

Figure 1: Histogram of first occupation’s income. Thousands of Leones.



Possible causes for this could be a misinterpretation of the question by both interviewers and interviewees, typing errors, or BRAC’s focus on high income population (i.e. mission drift). The independent variable “*TotSavings*” also presented similar problems. Overall, we used a case-by-case approach to account for the outliers.

Another limitation is related to the variable “*loanoutstand*”. This variable measures if someone in the household, other than the respondent, has a loan outstanding, and was intended to control for people having access to alternatives of BRAC’s microfinance program. By including this variable no statistically significant effect of the treatment is found. As presented in Table 2, a large proportion of the households in the treatment declared to have loans outstanding. The high correlation between “*loanoutstand*” and the treatment, Table 12A in the appendix, could be inflating the standard errors,

¹¹ <http://www.state.gov/e/eb/rls/othr/ics/2013/204729.htm>

and hence generating the lack of significance. Some preliminary tests¹² do not indicate this problem, but further analysis on this matter is recommended.

Finally, and also related to “*loanoutstand*”, around 50% of the treatment group has access to other sources of financing, and this could be the reason behind the lack of positive findings for the “*treatment*” variable. People could be just repaying old loans with BRAC’s money instead of investing it, or these household could have already extracted all the positive effects of microfinance from previous experiences with MFI’s. Several explanations for the same outcome: no significant results. Unfortunately, we do not have information regarding neither the source of the outstanding loans (loan shark or MFI?), nor on the vintage or amounts of those loans.

7. Conclusion

This research aimed at measuring the impact of BRAC’s microfinance program in Sierra Leone on two types of outcome variables those of poverty outreach of BRAC’s microfinance services (mainly explained by changes in income), and that of vulnerability (i.e. impact on education, food security health, housing, savings, expectations, and food security).

This analysis failed to identify significant impact on the outcome variables that indicate current state of being of the members. Yet, the analysis was able to identify a positive impact of the microfinance on future outlook provided by the respondents. More specifically, when controlling for knowledge of other microfinance programs a positive and significant impact of the microfinance programme was found for expected income bad year and expected income next month. This result indicates that the microfinance participants are more optimistic about the future outlook of their income when they have borrowed. It is important to notice the fact that the significant positive impact was found for the expected income in the bad year, which might suggest that microfinance lending programme helps attenuate the impact of a bad year and therefore smoothing the income over the bad and good years by reducing its volatility. However, further research of this finding is necessary.

¹² Variance Inflation Factor (VIF) approach.

8. Appendix

Table 3 A: Impact of treatment on current and expected monthly income

Independent variables	Dependent variables ^a				
	Monthly Income (stated)	Expectations			
		Exp. Income I (average)	Exp. Income II (Good)	Exp. Income III (Bad)	Exp. Income VI (next month)
Treatment	-46.63 0.04	102.87 0.04	110.53 0.18	100.54 0.02	105.07 0.02
M	-71.26 0.16	-5.94 0.16	-70.09 0.33	-72.61 0.09	-26.10 0.52
Age	-1.19 0.65	-0.10 0.65	-3.29 0.40	1.38 0.53	2.48 0.34
Education	19.34 0.65	-4.54 0.65	-14.26 0.30	6.41 0.60	5.05 0.58
Tribe	12.02 0.24	1.00 0.24	28.52 0.11	-4.09 0.42	21.09 0.02
Religion	-32.62 0.55	-2.72 0.55	-25.11 0.76	-46.61 0.46	-22.52 0.61
Nr. of Children	12.94 0.01	23.18 0.01	31.21 0.02	15.30 0.02	17.65 0.07
Occupation	21.88 0.01	16.72 0.01	22.96 0.02	12.46 0.01	47.27 0.0
t1	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
t2	(omitted)	(omitted)	-14.85 0.93	(omitted)	206.84 0.06
t3	62.59 0.47	5.22 0.47	17.09 0.92	96.65 0.16	158.37 0.03
t4	43.04 0.69	3.59 0.69	(omitted)	83.64 0.32	(omitted)
t5	-74.90 0.42	-6.24 0.42	-120.22 0.51	-14.68 0.88	42.78 0.58
t6	-133.08 0.12	-11.09 0.12	-196.42 0.26	-79.61 0.15	60.31 0.48
t7	-12.31 0.88	-1.03 0.88	-78.48 0.63	46.97 0.43	121.26 0.12
t8	128.49 0.13	10.71 0.13	139.21 0.43	110.42 0.06	55.01 0.46
Constant	397.30 0.04	33.11 0.04	609.59 0.05	177.93 0.39	15.87 0.92
Number of observations	728	698	703	700	675

Notes: ^a Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics. Total Income= Monthly income of first occupation; Expected. Income I= Exp. average monthly income for the coming year (simple average of good and bad year); Exp. Income II= Exp. monthly income for the coming year, if a GOOD year; Exp. Income III= Exp. monthly income for the coming year, if a BAD year; Exp. Income IV= Exp. income for current month..

Table 4A: Impact on current and expected income – Knowledge of MFI included as control

Independent variables	Dependent variables ^a				
	Monthly Income (stated)	Expectations			
		Exp. Income I (average)	Exp. Income II (Good)	Exp. Income III (Bad)	Exp. Income VI (next month)
Treatment	16.18 <i>0.86</i>	100.54 <i>0.27</i>	71.35 <i>0.59</i>	139.74 <i>0.05</i>	135.57 <i>0.10</i>
M	-17.19 <i>0.86</i>	-47.36 <i>0.60</i>	43.81 <i>0.72</i>	-127.91 <i>0.06</i>	-10.37 <i>0.89</i>
Age	7.74 <i>0.19</i>	6.15 <i>0.25</i>	12.90 <i>0.09</i>	0.70 <i>0.86</i>	6.72 <i>0.25</i>
Education	34.77 <i>0.15</i>	-14.93 <i>0.37</i>	-7.43 <i>0.76</i>	-18.11 <i>0.17</i>	-11.70 <i>0.44</i>
Tribe	-16.28 <i>0.35</i>	-10.96 <i>0.34</i>	-18.07 <i>0.28</i>	-4.07 <i>0.63</i>	21.45 <i>0.12</i>
Religion	-86.27 <i>0.36</i>	2.27 <i>0.98</i>	58.56 <i>0.54</i>	-100.26 <i>0.37</i>	15.78 <i>0.85</i>
Nr. of Children	-2.23 <i>0.89</i>	-15.32 <i>0.39</i>	-17.89 <i>0.49</i>	-7.27 <i>0.55</i>	6.25 <i>0.71</i>
Occupation	16.95 <i>0.26</i>	0.33 <i>0.97</i>	-5.11 <i>0.71</i>	6.45 <i>0.38</i>	47.50 <i>0.00</i>
t1	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
t2	-341.00 <i>0.07</i>	-289.00 <i>0.24</i>	-519.50 <i>0.21</i>	136.20 <i>0.16</i>	37.12 <i>0.81</i>
t3	-203.43 <i>0.28</i>	-325.32 <i>0.19</i>	-565.93 <i>0.17</i>	119.72 <i>0.26</i>	-17.84 <i>0.91</i>
t4	(omitted)	(omitted)	(omitted)	231.87 <i>0.05</i>	(omitted)
t5	-230.25 <i>0.34</i>	-420.14 <i>0.11</i>	-570.95 <i>0.20</i>	(omitted)	105.39 <i>0.54</i>
t6	-163.80 <i>0.41</i>	-70.39 <i>0.87</i>	-202.91 <i>0.74</i>	263.62 <i>0.33</i>	56.03 <i>0.75</i>
t7	-344.77 <i>0.05</i>	-323.84 <i>0.20</i>	-571.38 <i>0.18</i>	132.93 <i>0.16</i>	-85.69 <i>0.51</i>
t8	-145.37 <i>0.45</i>	-49.97 <i>0.85</i>	-189.24 <i>0.67</i>	300.77 <i>0.00</i>	-24.46 <i>0.87</i>
KnowsMicrofin.	15.27 <i>0.82</i>	127.20 <i>0.22</i>	197.72 <i>0.18</i>	60.13 <i>0.41</i>	130.24 <i>0.03</i>
Constant	530.29 <i>0.09</i>	564.17 <i>0.14</i>	562.66 <i>0.32</i>	357.71 <i>0.22</i>	-124.96 <i>0.67</i>
Number of observations	212	195	197	197	182

Notes: ^a Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics. Total Income= Monthly income of first occupation; Expected. Income I= Exp. average monthly income for the coming year (simple average of good and bad year); Exp. Income II= Exp. monthly income for the coming year, if a GOOD year; Exp. Income III= Exp. monthly income for the coming year, if a BAD year; Exp. Income IV= Exp. income for current month.

Table 4*A: Impact on current and expected income – Knowledge of MFI included as control

Independent variables	Dependent variables ^a				
	Monthly Income (stated)	Expectations			
		Exp. Income I (average)	Exp. Income II (Good)	Exp. Income III (Bad)	Exp. Income VI (next month)
Treatment	-50.29 <i>0.32</i>	97.49 0.05	102.82 <i>0.21</i>	96.50 0.02	104.09 0.02
M	24.09 <i>0.67</i>	-72.35 0.15	-72.34 <i>0.32</i>	-73.42 <i>0.09</i>	-26.53 <i>0.52</i>
Age	0.83 <i>0.72</i>	-0.73 0.77	-2.71 <i>0.48</i>	1.70 <i>0.43</i>	2.58 <i>0.33</i>
Education	34.77 <i>0.15</i>	-6.09 0.55	-16.79 <i>0.23</i>	5.32 <i>0.67</i>	4.68 <i>0.61</i>
Tribe	21.11 0.02	12.51 0.22	29.11 <i>0.10</i>	-3.74 <i>0.46</i>	21.17 0.02
Religion	22.55 <i>0.62</i>	-37.14 0.50	-30.22 <i>0.71</i>	-49.83 <i>0.43</i>	-23.19 <i>0.61</i>
Nr. of Children	11.99 <i>0.18</i>	21.91 0.01	29.23 0.04	14.41 0.03	17.37 <i>0.08</i>
Occupation	22.63 0.00	17.84 0.01	24.63 0.01	13.26 0.01	47.53 0.00
t1	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
t2	-110.48 <i>0.24</i>	(omitted)	-37.86 <i>0.83</i>	(omitted)	202.11 <i>0.07</i>
t3	-63.02 <i>0.47</i>	77.04 0.37	13.34 <i>0.94</i>	106.75 <i>0.12</i>	157.92 <i>0.03</i>
t4	(omitted)	60.02 <i>0.57</i>	(omitted)	95.71 <i>0.25</i>	(omitted)
t5	-52.66 <i>0.59</i>	-68.16 <i>0.46</i>	-135.46 <i>0.45</i>	-10.07 <i>0.92</i>	40.65 <i>0.60</i>
t6	-134.65 <i>0.14</i>	-114.72 0.20	-194.63 <i>0.25</i>	-66.57 <i>0.24</i>	60.50 <i>0.48</i>
t7	-235.10 0.01	-33.66 0.69	-132.95 <i>0.43</i>	31.33 <i>0.61</i>	111.03 <i>0.18</i>
t8	-84.03 <i>0.38</i>	103.36 0.22	-78.66 <i>0.65</i>	92.48 <i>0.12</i>	45.23 <i>0.54</i>
KnowsMicrofinII	91.10 <i>0.08</i>	132.01 0.04	186.08 0.04	93.44 0.04	3017 <i>0.48</i>
Constant	254.70 <i>0.08</i>	373.51 0.05	602.25 0.05	161.55 <i>0.42</i>	13.79 <i>0.93</i>
Number of observations	728	698	703	700	675

Notes: ^a Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics. Total Income= Monthly income of first occupation; Expected. Income I= Exp. average monthly income for the coming year (simple average of good and bad year); Exp. Income II= Exp. monthly income for the coming year, if a GOOD year; Exp. Income III= Exp. monthly income for the coming year, if a BAD year; Exp. Income IV= Exp. income for current month.

Table 4A: Impact on current and expected income – Loan outstanding dummy included as control**

Independent variables	Dependent variables ^a				
	Monthly Income (stated)	Expectations			
		Exp. Income I (average)	Exp. Income II (Good)	Exp. Income III (Bad)	Exp. Income VI (next month)
Treatment	-60.73 <i>0.29</i>	34.83 <i>0.57</i>	7.17 <i>0.94</i>	64.70 <i>0.19</i>	-0.07 <i>0.99</i>
M	23.73 <i>0.68</i>	-78.86 <i>0.12</i>	-81.55 <i>0.26</i>	-76.60 <i>0.08</i>	-38.24 <i>0.34</i>
Age	0.67 <i>0.78</i>	-0.74 <i>0.77</i>	-2.65 <i>0.48</i>	1.62 <i>0.47</i>	3.04 <i>0.25</i>
Education	19.74 <i>0.07</i>	-3.65 <i>0.71</i>	-13.05 <i>0.34</i>	6.89 <i>0.58</i>	6.42 <i>0.49</i>
Tribe	20.46 0.02	11.13 <i>0.27</i>	27.30 <i>0.10</i>	-4.60 <i>0.37</i>	19.59 0.04
Religion	24.41 <i>0.59</i>	-37.81 <i>0.49</i>	-31.80 <i>0.69</i>	-49.39 <i>0.42</i>	-29.09 <i>0.52</i>
Nr. of Children	12.99 <i>0.14</i>	23.42 0.01	31.52 0.02	15.42 0.02	-29.09 <i>0.52</i>
Occupation	21.68 0.00	15.79 0.02	21.59 0.03	12.01 0.02	46.70 0.00
t1	(omitted)	(omitted)	(omitted)	(omitted)	(omitted)
t2	(omitted)	-43.27 <i>0.68</i>	-16.58 <i>0.92</i>	(omitted)	191.95 <i>0.07</i>
t3	22.94 <i>0.71</i>	-6.61 <i>0.95</i>	-23.06 <i>0.90</i>	81.72 <i>0.24</i>	115.41 <i>0.13</i>
t4	89.70 <i>0.34</i>	(omitted)	(omitted)	83.01 <i>0.32</i>	(omitted)
t5	36.12 <i>0.64</i>	-161.13 <i>0.15</i>	-186.12 <i>0.30</i>	-38.64 <i>0.67</i>	-27.67 <i>0.73</i>
t6	-41.19 <i>0.56</i>	-151.41 <i>0.15</i>	-159.01 <i>0.36</i>	-67.76 <i>0.21</i>	96.46 <i>0.27</i>
t7	-130.00 0.03	-119.66 <i>0.24</i>	-176.12 <i>0.30</i>	11.91 <i>0.85</i>	17.12 <i>0.83</i>
t8	27.89 <i>0.72</i>	39.41 <i>0.72</i>	69.23 <i>0.70</i>	84.96 <i>0.16</i>	-17.09 <i>0.82</i>
LoanOutstand.	22.78 <i>0.61</i>	113.21 <i>0.07</i>	171.29 <i>0.10</i>	59.57 <i>0.18</i>	174.98 0.00
Constant	174.99 <i>0.23</i>	477.90 0.02	668.06 0.03	198.68 <i>0.32</i>	76.01 <i>0.63</i>
Number of observations	727	697	702	699	674

Notes: ^a Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics. Total Income= Monthly income of first occupation; Expected. Income I= Exp. average monthly income for the coming year (simple average of good and bad year); Exp. Income II= Exp. monthly income for the coming year, if a GOOD year; Exp. Income III= Exp. monthly income for the coming year, if a BAD year; Exp. Income IV= Exp. income for current month.

Table 5A: Impact of treatment on entrepreneurship - Knowledge of MFI included as control

Independent variables	Dependent variables	
	Business Plan ^a	Business Plan ^{a b}
Treatment	0.018 <i>0.70</i>	0.115 <i>0.12</i>
M	0.06 <i>0.23</i>	-0.09 <i>0.29</i>
Age	-0.004 <i>0.10</i>	-0.007 <i>0.06</i>
Education	0.01 <i>0.12</i>	0.01 <i>0.43</i>
Tribe	-0.012 <i>0.13</i>	0.002 <i>0.85</i>
Religion	-0.03 <i>0.45</i>	-0.07 <i>0.39</i>
Nr. of Children	0.005 <i>0.57</i>	0.010 <i>0.56</i>
Occupation	0.01 <i>0.14</i>	0.04 <i>0.01</i>
t1	(omitted)	(omitted)
t2	(omitted)	-0.06 <i>0.74</i>
t3	0.183 <i>0.03</i>	0.011 <i>0.96</i>
t4	0.37 <i>0.00</i>	0.48 <i>0.01</i>
t5	0.060 <i>0.50</i>	0.074 <i>0.71</i>
t6	0.14 <i>0.12</i>	(omitted)
t7	0.033 <i>0.69</i>	-0.100 <i>0.52</i>
t8	-0.02 <i>0.83</i>	-0.12 <i>0.45</i>
KnowsMicrofin.	--	-0.131 <i>0.07</i>
Constant	0.35 <i>0.02</i>	0.62 <i>0.02</i>
Number of observations	766	216

Notes: ^a Dummy variable, equals 1 if the person has a new business plan. ^b Includes the dummy “*Knowledge of Microfinance*” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics

Table 5*A: Impact of treatment on entrepreneurship - Knowledge of MFI included as control

Independent variables	Dependent variables	
	Business Plan ^a	Business Plan ^{a b}
Treatment	0.018 <i>0.70</i>	0.025 <i>0.60</i>
M	0.061 <i>0.22</i>	0.061 <i>0.22</i>
Age	-0.004 <i>0.10</i>	-0.004 <i>0.07</i>
Education	0.015 <i>0.12</i>	0.016 <i>0.09</i>
Tribe	-0.012 <i>0.13</i>	-0.012 <i>0.13</i>
Religion	-0.033 <i>0.45</i>	-0.033 <i>0.49</i>
Nr. of Children	0.005 <i>0.57</i>	0.006 <i>0.51</i>
Occupation	0.011 <i>0.14</i>	0.010 <i>0.17</i>
t1	(omitted)	(omitted)
t2	(omitted)	(omitted)
t3	0.183 <i>0.03</i>	0.167 <i>0.05</i>
t4	0.367 <i>0.00</i>	0.349 <i>0.00</i>
t5	0.060 <i>0.50</i>	0.054 <i>0.55</i>
t6	0.139 <i>0.12</i>	0.119 <i>0.18</i>
t7	0.033 <i>0.69</i>	0.050 <i>0.54</i>
t8	-0.017 <i>0.83</i>	0.002 <i>0.98</i>
KnowsMicrofinII	-- --	-0.117 0.01
Constant	0.350 <i>0.02</i>	0.371 <i>0.01</i>
Number of observations	766	766

Notes: ^a Dummy variable, equals 1 if the person has a new business plan. ^b Includes the dummy “*Knowledge of Microfinance**” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics

Table 5A: Impact of treatment on entrepreneurship - Knowledge of MFI included as control**

Independent variables	Dependent variables	
	Business Plan ^a	Business Plan ^{a b}
Treatment	0.018 <i>0.70</i>	-0.029 <i>0.61</i>
M	0.061 <i>0.22</i>	0.057 <i>0.26</i>
Age	-0.004 <i>0.10</i>	-0.003 <i>0.12</i>
Education	0.015 <i>0.12</i>	0.015 <i>0.11</i>
Tribe	-0.012 <i>0.13</i>	-0.012 <i>0.11</i>
Religion	-0.033 <i>0.45</i>	-0.037 <i>0.40</i>
Nr. of Children	0.005 <i>0.57</i>	0.006 <i>0.55</i>
Occupation	0.011 <i>0.14</i>	0.011 <i>0.16</i>
t1	(omitted)	(omitted)
t2	(omitted)	(omitted)
t3	0.183 <i>0.03</i>	0.169 <i>0.05</i>
t4	0.367 <i>0.00</i>	0.371 <i>0.00</i>
t5	0.060 <i>0.50</i>	0.034 <i>0.71</i>
t6	0.139 <i>0.12</i>	0.159 <i>0.08</i>
t7	0.033 <i>0.69</i>	-0.008 <i>0.93</i>
t8	-0.017 <i>0.83</i>	-0.0047 <i>0.58</i>
LoanOutstand.	-- --	0.080 0.12
Constant	0.350 <i>0.02</i>	0.374 <i>0.01</i>
Number of observations	766	765

Notes: ^a Dummy variable, equals 1 if the person has a new business plan. ^b Includes the dummy "loanoutstand" as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics

Table 6A: Impact of treatment on health

Independent variables	Dependent variables	
	Health I (declared status)	Health II (# of meals)
Treatment	-0.011 <i>0.85</i>	0.070 <i>0.15</i>
M	-0.093 <i>0.11</i>	-0.048 <i>0.35</i>
Age	-0.002 <i>0.41</i>	-0.007 <i>0.00</i>
Education	0.011 <i>0.32</i>	0.003 <i>0.78</i>
Tribe	0.024 <i>0.01</i>	0.006 <i>0.40</i>
Religion	0.006 <i>0.90</i>	-0.129 <i>0.00</i>
Nr. of Children	0.021 <i>0.05</i>	-0.007 <i>0.47</i>
Occupation	0.012 <i>0.08</i>	0.020 <i>0.00</i>
t1	(omitted)	(omitted)
t2	0.290 <i>0.01</i>	(omitted)
t3	0.103 <i>0.31</i>	0.250 <i>0.00</i>
t4	(omitted)	0.307 <i>0.00</i>
t5	0.184 <i>0.07</i>	0.089 <i>0.33</i>
t6	0.097 <i>0.35</i>	0.081 <i>0.38</i>
t7	-0.157 <i>0.08</i>	0.150 <i>0.09</i>
t8	-0.238 <i>0.01</i>	0.313 <i>0.00</i>
Constant	2.210 <i>0.00</i>	0.803 <i>0.00</i>
Number of observations	760	763

Notes: ^a Dummy variable, equals 1 if the person declares his/her status to be GOOD, and 0 if under this mark. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 7A: Impact of treatment on health - Knowledge of MFI included as control

Independent variables	Dependent variables	
	Health I (declared status)	Health II (# of meals)
Treatment	0.040 <i>0.62</i>	0.275 <i>0.00</i>
M	-0.065 <i>0.49</i>	-0.181 <i>0.06</i>
Age	0.000 <i>0.96</i>	-0.003 <i>0.50</i>
Education	0.017 <i>0.31</i>	-0.010 <i>0.63</i>
Tribe	0.014 <i>0.27</i>	0.014 <i>0.33</i>
Religion	0.114 <i>0.09</i>	-0.113 <i>0.20</i>
Nr. of Children	0.048 <i>0.01</i>	-0.024 <i>0.22</i>
Occupation	-0.009 <i>0.47</i>	0.025 <i>0.02</i>
t1	(omitted)	(omitted)
t2	0.409 <i>0.06</i>	-0.448 <i>0.01</i>
t3	0.246 <i>0.35</i>	-0.438 <i>0.01</i>
t4	(omitted)	(omitted)
t5	0.399 <i>0.07</i>	-0.122 <i>0.50</i>
t6	0.221 <i>0.34</i>	-0.386 <i>0.04</i>
t7	-0.034 <i>0.85</i>	-0.288 <i>0.03</i>
t8	0.071 <i>0.72</i>	-0.188 <i>0.19</i>
KnowsMicrofin.	-0.170 <i>0.03</i>	-0.196 <i>0.02</i>
Constant	1.887 <i>0.00</i>	1.202 <i>0.00</i>
Number of observations	214	216

Notes: ^a Dummy variable =1 if the person declares his/her status to be GOOD, and =0 if under this mark. Includes the dummy “*Knowledge of Microfinance*” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 8A: Impact of treatment on savings

Independent variables	Dependent variables	
	Savings I ^a (saving behavior)	Savings II ^b (amount saved)
Treatment	0.047 <i>0.18</i>	-14,694 <i>0.88</i>
M	-0.002 <i>0.97</i>	129,336 <i>0.18</i>
Age	-0.001 <i>0.55</i>	-2,544 <i>0.58</i>
Education	0.008 <i>0.24</i>	13,027 <i>0.49</i>
Tribe	0.008 <i>0.10</i>	22,309 <i>0.15</i>
Religion	-0.031 <i>0.31</i>	-35,271 <i>0.68</i>
Nr. of Children	0.000 <i>0.98</i>	3,620 <i>0.81</i>
Occupation	0.001 <i>0.79</i>	-302 <i>0.98</i>
t1	(omitted)	(omitted)
t2	(omitted)	(omitted)
t3	0.228 <i>0.00</i>	-12,299 <i>0.89</i>
t4	0.157 <i>0.06</i>	140,269 <i>0.40</i>
t5	-0.043 <i>0.59</i>	-43,245 <i>0.64</i>
t6	0.227 <i>0.00</i>	-165,268 <i>0.12</i>
t7	0.209 <i>0.00</i>	137,534 <i>0.19</i>
t8	0.239 <i>0.00</i>	501,048 <i>0.00</i>
Constant	0.705 <i>0.00</i>	434,763 <i>0.08</i>
Number of observations	764	638

Notes: ^a Dummy variable =1 if the person declares to save money. ^b Amount in thousands of Leones. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 9A: Impact of treatment on savings - Knowledge of MFI included as control

Independent variables	Dependent variables	
	Savings I ^a (saving behavior)	Savings II ^b (amount saved)
Treatment	0.015 <i>0.75</i>	-26.40 <i>0.91</i>
M	-0.024 <i>0.69</i>	351.88 <i>0.12</i>
Age	0.001 <i>0.81</i>	-3.83 <i>0.77</i>
Education	-0.009 <i>0.48</i>	34.77 <i>0.53</i>
Tribe	0.003 <i>0.67</i>	-0.97 <i>0.97</i>
Religion	-0.039 <i>0.39</i>	-91.30 <i>0.71</i>
Nr. of Children	0.010 <i>0.44</i>	-33.21 <i>0.36</i>
Occupation	0.000 <i>0.99</i>	-45.89 <i>0.07</i>
KnowsMicrofin.	-0.01 <i>0.82</i>	-330.89 <i>0.08</i>
t1	(omitted)	(omitted)
t2	-0.02 <i>0.90</i>	-242.73 <i>0.33</i>
t3	0.03 <i>0.84</i>	-162.56 <i>0.54</i>
t4	(omitted)	10.23 <i>0.99</i>
t5	-0.22 <i>0.19</i>	(omitted)
t6	0.10 <i>0.32</i>	-313.41 <i>0.39</i>
t7	0.04 <i>0.74</i>	27.09 <i>0.90</i>
t8	0.09 <i>0.43</i>	649.53 <i>0.03</i>
Constant	0.932 <i>0.00</i>	1,127.58 <i>0.14</i>
Number of observations	216	196

Notes: ^a Dummy variable =1 if the person declares to save money. ^b Amount in thousands of Leones. . Includes the dummy “Knowledge of Microfinance” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 10A: Impact of treatment on aspirations

Independent variables	Dependent variables ^a	
	Aspiration I (current)	Aspiration II (future)
Treatment	0.018 <i>0.90</i>	0.069 <i>0.67</i>
M	0.226 <i>0.11</i>	-0.134 <i>0.42</i>
Age	0.008 <i>0.24</i>	0.002 <i>0.72</i>
Education	0.075 <i>0.01</i>	0.019 <i>0.52</i>
Tribe	-0.014 <i>0.51</i>	0.007 <i>0.78</i>
Religion	0.333 <i>0.01</i>	0.173 <i>0.22</i>
Nr. of Children	0.046 <i>0.12</i>	0.013 <i>0.63</i>
Occupation	-0.021 <i>0.26</i>	-0.022 <i>0.19</i>
t1	(omitted)	(omitted)
t2	-0.415 <i>0.35</i>	-0.914 <i>0.00</i>
t3	-0.165 <i>0.66</i>	-0.406 <i>0.01</i>
t4	(omitted)	(omitted)
t5	-0.778 <i>0.05</i>	-1.056 <i>0.00</i>
t6	-0.283 <i>0.45</i>	-0.805 <i>0.00</i>
t7	1.012 <i>0.01</i>	-0.155 <i>0.15</i>
t8	0.702 <i>0.06</i>	-0.237 <i>0.04</i>
Constant	3.743 <i>0.00</i>	9.535 <i>0.00</i>
Number of observations	726	726

Notes: ^a Aspirations is measured by a scale 1 to 10, in which 10 represents the maximum level of aspirations. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 11A: Impact of treatment on aspirations - Knowledge of MFI included as control

Independent variables	Dependent variables ^a	
	Aspiration I (current)	Aspiration II (future)
Treatment	-0.108 <i>0.66</i>	0.033 <i>0.86</i>
M	0.396 <i>0.12</i>	-0.209 <i>0.19</i>
Age	0.024 <i>0.07</i>	0.007 <i>0.39</i>
Education	0.121 <i>0.02</i>	-0.002 <i>0.92</i>
Tribe	-0.035 <i>0.23</i>	0.034 <i>0.02</i>
Religion	0.269 <i>0.24</i>	-0.300 <i>0.01</i>
Nr. of Children	-0.025 <i>0.74</i>	0.022 <i>0.49</i>
Occupation	-0.003 <i>0.93</i>	-0.045 <i>0.05</i>
KnowsMicrofin.	0.568 <i>0.02</i>	0.088 <i>0.64</i>
t1	(omitted)	(omitted)
t2	(omitted)	(omitted)
t3	1.437 <i>0.03</i>	0.462 <i>0.43</i>
t4	2.592 <i>0.00</i>	0.709 <i>0.21</i>
t5	-0.089 <i>0.89</i>	0.375 <i>0.50</i>
t6	0.310 <i>0.67</i>	0.271 <i>0.67</i>
t7	1.892 <i>0.00</i>	0.462 <i>0.40</i>
t8	1.137 <i>0.05</i>	0.370 <i>0.49</i>
Constant	2.212 <i>0.01</i>	9.690 <i>0.00</i>
Number of observations	203	203

Notes: ^a Aspirations is measured by a scale 1 to 10, in which 10 represents the maximum level of aspirations. Includes the dummy “*Knowledge of Microfinance*” as control. Results estimated by ordinary least-squares (OLS) regression, with robust errors. P-values in italics.

Table 12A: Correlation matrix

	Treatment	M	Age	Education	Tribe	Religion	Nr. of Children	Occupation	KnowsMicrofin	LoanOutstand.
Treatment	1.000									
M	0.599	1.000								
Age	0.105	0.060	1.000							
Education	-0.058	0.001	-0.148	1.000						
Tribe	-0.004	0.046	0.081	0.198	1.000					
Religion	0.126	-0.008	0.056	-0.287	-0.080	1.000				
Nr. of Children	0.156	0.076	0.183	-0.131	-0.088	0.091	1.000			
Occupation	-0.074	-0.050	0.008	0.060	0.030	-0.037	-0.057	1.000		
KnowsMicrofin	-0.003	0.002	-0.049	0.053	0.020	0.038	0.025	-0.006	1.000	
LoanOutstand.	0.467	0.302	0.031	-0.043	0.046	0.109	0.043	0.030	0.230	1.000
