

Allocating Cash Savings and the Role of Information: Evidence from a Field Experiment in Uganda*

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Abstract

Microfinance in general and microcredit programs in particular have attracted much attention among interest groups concerned with the alleviation of poverty. More recently, however, the spotlight has turned increasingly on the development and promotion of microsaving devices suitable for the unbanked poor. Along these lines, the Saving Mobilization program implemented by BRAC in Uganda is an attempt to encourage a savings culture as well as to overcome informational barriers to make use of saving services at formal financial institutions. Exploiting a randomized control trial, the aim of this study is to investigate the impact of this program on the saving behavior of participants. The intervention is successful in increasing the usage of semi-formal financial institutions on the extensive margin as well as to boost the amount held at these institutions. The total amount of savings, however, remains unaffected. Importantly, the analysis reveals substantial impact heterogeneity. While illiterate individuals appear to benefit from the information received during the promotion campaign, the program appears to serve as a trigger for individuals having experienced robbery or theft in the recent past. Both subgroups are far more likely to save at more formal financial institutions.

Keywords: Microfinance, saving promotion, theft, literacy, Uganda.

JEL Classification: D04, D14, G21, O16.

1 Introduction

Microfinance and access to financial services in general are seen today as important building blocks of many strategies concerned with fighting poverty in developing countries. Much attention has been given to interventions that focus on the provision of capital to individuals in the form of small loans in order to allow recipients to exploit their entrepreneurial potential.¹ More recently, however, considerable attention

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¹A thorough summary of various aspects frequently discussed in the context of microcredit programs is provided in Armendriz and Morduch (2010) as well as in Morduch (1999).

has been paid to financial services such as insurance and savings schemes specifically targeted to suit the needs of the poor. In addition to expanding the often limited availability of such services, emphasis is being placed on promoting the already existing range of products. The *Saving Mobilization* program introduced by BRAC in Uganda represents such an effort and it is the aim of this study to investigate its short-term impact on the saving behavior of beneficiaries.²

The ability to save and thus to aggregate smaller amounts of money into a single lump sum in order to self-fund larger payments may especially be important in the context of poorer households. These households are frequently assumed to face credit constraints which potentially undermine their ability to finance, for example, potentially profitable but sizeable business investments. Besley et al. (1993), for instance, regard the purchase of durable goods as one of the underlying rationales for the widespread existence of rotating savings and credit associations (ROSCAs) in the developing world.³ Credit constraints may additionally limit the options available to households having to deal with emergencies in the absence of a liquid buffer stock of capital. In this sense, savings represent a form of insurance which may help to decrease the vulnerability to economic shocks. Another argument frequently brought forward in support of savings accumulation is the interest earned by many saving devices. In addition, savings at formal institutions often have the benefit of being easily transferrable across long distances as well as potentially providing access to otherwise restricted financial services such as insurance policies or credit.

Savings at formal or semi-formal financial institutions also provide a relatively secure way of holding household or individual wealth which may otherwise be prone to theft or other forms of loss. In Ugandan data analyzed by Wright and Mutesasira (2001), for example, only 15 percent of respondents experienced any loss of savings kept at banks in the previous twelve months.⁴ The equivalent rates for semi-formal institutions, namely ROSCAs and ASCAs, are 27 percent and 40 percent respectively. Albeit riskier than formal institutions, such semi-formal institutions are still considerably safer than the two most prominent informal devices, cash savings kept at home and savings in kind, with reported loss rates of staggering 68 and 75 percent respectively. Insecurity in this context, however, can be understood in a rather broad sense. Wright and Mutesasira (2001) note that out of those that reported losses to cash savings kept at home, 45 percent held their own petty spending responsible. This type of self-control problem is frequently called upon in explanatory approaches for the attractiveness of commitment saving devices and further discussed later on. Another 27 percent attributed their losses to the demands of friends and relatives for assistance. This observation is well documented and serves as an important factor in the financial decision making of households as described, for example, by Baland et al. (2011). In this study, however, the focus is placed on the third most frequently named reason for the loss of savings kept at home, namely that savings had been stolen. While formal savings devices may discourage petty spending and demands on savings from outside the household, such devices cannot prevent these from occurring. In contrast, however, formal saving devices may effectively eliminate the risk of losing savings to theft.

Despite these advantages, however, the poor may hold savings at formal or semi-formal financial institutions which may be considered to fall short of the optimal level. After all, this should be viewed as a necessary pre-condition for a successful demand side promotion intervention. There are two main

²The non-governmental organization BRAC (Building Resources Across Communities) originated as a Microfinance lender in Bangladesh and has started to deliver its services in other countries in 2002. Commencing in 2006, BRAC Uganda as a regional subsidiary has rapidly expanded to reach over 100,000 Microfinance clients by September 2009.

³This claim is supported by an empirical investigation based on data from Taiwan in Besley and Levenson (1996).

⁴This category includes formal banks, post office savings and savings held at insurance companies or pension funds. Wright and Mutesasira (2001) note that most of these losses were apparently caused by problems experienced by respondents who tried to recover their savings at *Co-operative Bank* after its forced closure.

arguments brought forward why formal saving mechanisms may indeed be underutilized. First, potential knowledge gaps concerning the access to and the working mechanism of more advanced saving devices represents a major barrier to entry into the formal or semi-formal sector. The Saving Mobilization program is mainly designed to address this obstacle. Second, administrative costs involved in opening up and operating bank accounts are prohibitively high in light of the small amounts saved by the poor.

This study will concentrate on the *Saving Mobilization* program introduced by BRAC Uganda in order to educate participants on the importance of saving in general as well as to inform them about suitable saving devices with a special emphasis on savings held at formal financial institutions. The latter aim is motivated by the conviction that the poor and particularly those who live in rural areas may not possess adequate knowledge of the existence, functionality and the process of accessing saving devices offered by formal institutions.⁵ Hence, the intervention, directly attempts to relax the constraint posed by the knowledge gap but leaves the cost structure of available saving devices unaffected. It should be further noted that the training intends to shift the intensive margin of saving in general as well as to address the extensive margin of utilizing more formal saving devices.

Using a randomized control trial methodology, the analysis shows that the promotion program is successful in increasing the usage of semi-formal financial institutions on the extensive margin by about 9 percentage points (pp) as well as in boosting the amount of savings held at these institutions. The total amount of savings, however, remains unaffected and the program consequentially appears to have caused primarily a reallocation of monetary wealth during which program beneficiaries switch from informal to more formal saving devices. Furthermore, impact heterogeneity proves to be very important as the analysis reveals that illiterate individuals as well as individuals who experienced robbery or theft in the recent past are significantly more likely to respond to the program. Hence, the evidence suggests that the financial knowledge constraint is indeed binding for a subset of the Ugandan sample studied and that the relative security of saving mechanisms is a key determinant of portfolio decisions once additional information concerning available saving options is provided. These results withstand a series of robustness checks.

Therefore, this analysis adds to a growing body of literature that tests the implications of relaxing the cost as well as the informational constraints. Cole et al. (2011) investigate a financial education intervention in Indonesia. By randomly providing a financial literacy course to unbanked households in their study area, they find that only those with low levels of education or financial literacy increase their demand for bank accounts in response to the intervention.⁶ An additional treatment reveals that a small subsidy paid for opening up a bank account is both more effective and more cost-efficient than the financial literacy training. Despite potential secondary benefits of the training course, the study thus argues in favor of tackling the cost constraint first.

Along the same line, Dupas and Robinson (2009) report the results from an experiment offering to pay the opening fee and minimum balance required for a savings account to a randomly selected sample of mainly market vendors in rural Kenya. Therefore, the experiment disregards possible informational

⁵Hence, this intervention explicitly concentrates on the demand for formal financial services. In contrast, previous studies have also investigated the effect of increased financial access through an expansion of the supply side. Burgess and Pande (2005), for example, causally link increased financial access facilitated through widening the distribution of bank branches in rural India to the reduction in rural poverty. Similarly, Aportela (1999) studies the expansion of a Mexican savings institute and finds that increased access to formal as well as relatively easy and cheap saving instruments not only raises the savings rate on average but especially affects the poor.

⁶Lusardi (2008) provides a survey article documenting similar findings for developed countries, namely the US, including differential impacts of financial literacy courses on savings and contributions to their pension by high versus low educated employees.

gaps and focuses on removing the constraints imposed by the initial costs of opening a bank account. The results show that women in the treatment group increase their savings, business investment, income and expenditures. The effect on men, however, is marginal. The authors conclude that one interpretation of the latter finding is that men can save at home more securely, which implies that promotion programs for formal saving devices may be especially effective when primarily offered to women.

Another strand of the literature concerned with saving promotion focuses on the group of people who already use formal saving devices actively and study the importance of product features. In an experimental setting, Ashraf et al. (2006b), for example, find that short sessions that stress the importance of savings positively affects bank account balances, but that this effect is statistically indistinguishable from zero. Offering a new commitment saving device, however, proved to be effective in increasing balances. Closely related, home visits by deposit collectors are studied by Ashraf et al. (2006a) and the introduction of saving reminders by Karlan et al. (2010).

The remainder of this paper is organized as follows. Section 2 highlights the most important features of the Savings Promotion pilot program implemented by BRAC in Uganda. The research design and the estimation strategy are described in section 3. Section 4 introduces the data collected followed by a brief outline of the saving behavior of survey respondents in section 5. The main results are discussed in detail in section 6 while the robustness of these results is investigated in section 7. Finally, section 9 provides the concluding remarks.

2 The Saving Mobilization Program

The Saving Mobilization program was primarily designed to educate beneficiaries about the importance of savings in general, different types of available saving services and the cost of saving. This program also provided information on how to access and operate more formal and relatively secure saving devices. Underlying this objective is the rationale that many Ugandans lack the procedural knowledge necessary to make use of more formal financial saving devices. In addition, it was the organization's conviction that, in particular, the rural poor are spuriously intimidated by the level of formality featured by many financial institutions. As a consequence, a considerable number of potential clients may restrain themselves from making use of readily available formal saving devices. Although BRAC, as a microlender, of course expects to also benefit from improvements in its clients' ability to meet their periodic loan installment payments as a result of successful saving promotion. However, the program does not explicitly promote specific saving products or institutions.⁷ Therefore, the saving promotion program neither alters or expands the opportunity set of financial services available to beneficiaries, nor does it change the cost of accessing these services.

During the studied pilot phase of the intervention, active BRAC Microfinance borrowers constituted the exclusive beneficiary group.⁸ To that extent, this study aligns itself with the literature concerned with impact assessments of business training and financial literacy courses on the economic performance of Microfinance clients (see, for example, Drexler et al. (2010), Field et al. (2010) and Karlan and Valdivia (2010)). The actual training sessions were conducted during or after the regular weekly Microfinance group meetings. According to the Microfinance program rules, group meeting attendance is compulsory

⁷BRAC Uganda by itself is not legally allowed to act as a deposit taking institution and, therefore, does not offer financial services substitutable for bank or saving accounts.

⁸From the outset, the intention was to expand this program consecutively to other villagers independent of a Microfinance membership.

for every actively borrowing member. Non-borrowing members are invited but not required to join the meetings as well. A Microfinance group typically consists of 20 to 35 members. Since BRAC only works with women in its group-based Microfinance program, all beneficiaries are consequently female. One of the implications of this feature for further analysis is that there is no heterogeneity in gender among the individuals included in the sample studied.

The actual savings orientation is conducted by so-called *Saving Promoters* who are selected from the pool of Microfinance members in intervention areas. The selection process is undertaken by the credit officers and branch managers in consultation with the Microfinance group members. There are only few binding requirements set for selection but promoters necessarily need to possess prior experience in operating a bank account. Before the start of the intervention, each saving promoter attends a two to three day training in order to get familiarized with the program’s objectives, procedures and the formal content of the teaching material. Additionally, promoters are also asked to provide assistance to members during the process of applying for a savings account. Promoters are entitled to be compensated for this service by a small fee (UGX 1,000) paid by the respective applicant.

3 Experimental Design

3.1 Randomization

From the outset, the strategy behind the evaluation of the saving promotion program was built on a randomization design in order to allow for impact identification.⁹ During the pilot phase of the program, it was decided to focus on two areas: the Eastern part of Uganda’s capital Kampala, and the region around Iganga which is a local trade center on the route between Kampala and Nairobi. Out of the nine BRAC branch offices selected to implement the promotion program, four are located in Kampala and five in the Iganga area.¹⁰

In each of the participating nine branches, 15 clusters containing three Microfinance groups each were formed. The resulting structure of individual clusters turns out to be very heterogeneous ranging from Microfinance groups in three distinct villages to Microfinance groups located in one part of a single large village or slum. However, special emphasis was placed on the careful geographical positioning of clusters in order to prevent contamination of the randomized treatment status and to ease the work of program staff. Randomization then took place at the cluster level. Two thirds of the clusters within each branch were randomly assigned to treatment which leaves the remaining one third as controls. In total, this strategy produced 90 treatment clusters (or 270 treatment Microfinance groups) and 45 control clusters (or 135 control Microfinance groups) equally distributed across branches. Each treatment cluster is served by a single saving promoter.

From the population of these 405 Microfinance groups, borrowers were randomly selected to take part in the survey. The main baseline data collection was finalized before Microfinance members were asked to assist in the selection process of the savings promoters in order to minimize anticipation effects. The

⁹Above all, the advantage of using this design lies in the absence of a selection bias. A review study discussing this feature at length is provided, for example, by Duflo et al. (2008).

¹⁰More precisely, in the Kampala area branches in Kalerwe, Kasubi, Kisase and Wakiso were selected. In the Iganga area the branches located in Bugiri, Busia, Iganga, Kaliro and Palisa were selected for the pilot phase. Originally, a fifth branch in Kampala, namely Kasangati, was planned to offer the program as well. Due to operational problems, however, the program ceased its activities in this branch after a few weeks. As a means of caution and in order to prevent an inconsistent definition of the treatment, all individuals from this branch are dropped from the analysis.

follow-up survey was carried out after the program had operated for about six months. Hence, the impact assessment can necessarily only provide conclusions on the short-run effects of the program.

3.2 Estimation Strategy

In this study, the impact of the Saving Promotion program is measured by intention-to-treat (ITT) estimates. More precisely, the variable capturing the treatment status, T_j equals one if the Microfinance group j forms part of a cluster contained in the treatment group and zero otherwise. This indicator, however, disregards potentially important dimensions of treatment such as the length of treatment, effort of the respective saving promoter or whether borrowers were in fact frequent visitors of the group meetings. Nevertheless, the ITT is especially under scaling-up considerations of great importance. Hence, the impact of the program is estimated by the following equation

$$y_{ijt_1} = \alpha + X_{ijt_0}\beta + Z_{jt_0}\gamma + T_j\delta + \varepsilon_{ij} \quad (1)$$

Here, y_{ijt} is the level of an outcome variable for household i in Microfinance group j . The subscript t indicates the survey wave from which the information is taken where t_0 stands for the baseline and t_1 for the follow-up survey. Again, T_j is the treatment indicator and, therefore, δ constitutes the parameter of interest by capturing the program's impact on the level of the outcome variable. Although the inclusion of additional controls, allowing for heterogeneity due to initial conditions, has no influence on the expected value of δ , it may increase the precision by which it is estimated. Therefore, X_{ijt} and Z_{jt} are vectors of individual or household and Microfinance group characteristics respectively.¹¹ Z_{jt} will additionally contain and in some cases purely consist of dummy variables for all but one of the branches studied. Because of the randomized treatment status, this equation can be consistently estimated by OLS.

While the above equation can be regarded as the base or default specification, the actual model estimated may differ from OLS depending on the nature of the respective outcome variable. That is, in case of limited dependent variables marginal effects for either a Probit or a Tobit model will be estimated accordingly.¹² Moreover, if not stated otherwise, all standard errors reported for coefficients and marginal effects are clustered at the Microfinance group level.

4 Data

This study builds on data that was deliberately collected in order to allow for a comprehensive impact assessment. Therefore, information was recorded on outcomes of interest as well as on background characteristics including household composition, basic demographics, education, socio-economic household status, savings, credit, asset ownership as well as risk and time preferences.

At baseline, the aim was to interview a maximum of four borrowers from each treated Microfinance group and six borrowers from each control group respectively. Data from BRAC's internal reporting system for the Microfinance program was used to identify potential survey participants and to stratify

¹¹As default, X_{ijt} consists of the household size, the number of household members who are aged five or younger, an indicator which equals one if the household head is male, the respondent's age, indicators which equal one if the respondent is illiterate and has always lived in the village respectively and zero otherwise, an indicator which equals one if the household is engaged in crop farming and zero otherwise and the number of household members engaged in income generating activities. Z_{jt} contains the Microfinance group size and the group's average membership duration.

¹²In case of interaction terms as the explanatory variables, the marginal effects are computed in accordance with Ai and Norton (2003).

the sample of survey respondents and groups.¹³ Respondents were drawn from the pool of borrowers which still faced a considerable repayment period in order to maximize the respondents' exposure to the intervention in the treatment group. Hence, in some cases the targeted number of respondents per group was not met and an effort was made to substitute in additional respondents from other Microfinance groups with the equivalent treatment status and within the same branch.

In April 2010, the follow-up survey was initialized approximately six months after the beginning of program operation. It was planned to re-interview all baseline respondents in order to construct a panel data set on the Microfinance borrower level. In addition, the enumerators were instructed to randomly select a maximum of three additional Microfinance members from each of the 405 studied groups.¹⁴

Overall, 1,823 borrowers were interviewed at baseline and 2,348 during the follow-up survey. The panel consists of 1,437 borrowers which implies a relatively high attrition rate of about 21 percent.¹⁵ This study will be primarily based on these panel households. All monetary values in this study are expressed in Ugandan Shillings (UGX). At the beginning of the baseline survey \$1 was worth roughly UGX 2,000.

Table 1 summarizes key variables that capture socio-economic background information of survey respondents and their households as well as Microfinance group characteristics. In addition, the table indicates that these variables are well balanced between the treatment and the control groups irrespective of whether the panel respondents or the entire baseline are considered (columns 2 and 3). Finally, Table 1 exposes differences between panel respondents and those baseline respondents who were unavailable, declined to be interviewed or were not found during the follow-up survey. Column 4 suggests that there are only small differences at baseline between these two groups in terms of variables characterizing their economic activities and demographics. Nevertheless, the results in the main part of this study should only be interpreted as valid for the panel available. The implications of panel attrition for the external validity will be investigated further in section 7.3.

5 Saving Behavior

Summary statistics of variables with relevance for the understanding of how the panel respondents at baseline manage their financials are provided in Table 2. Special emphasis is placed on their saving behavior which also corresponds to the variables of greatest interest with regards to the aims and scope of the Saving Mobilization program.

In the first part of Table 2 various saving schemes or devices are categorized into *formal*, *semi-formal* and *informal* institutions.¹⁶ It is important to note that the three categories are non-exclusive implying

¹³The sample was stratified according to basic demographic characteristics of the Microfinance borrowers and loan related information such as the number of loans borrowed in the past or loan sizes.

¹⁴This was done out of power considerations in case of outcome variables only measured at follow-up. In order to ensure a random selection of additional respondents, the enumerators were asked to choose respondents according to the following procedure: All Microfinance members present at the group meeting attended by the team of enumerators were asked to draw small paper balls from a bag. The number of paper balls equaled the number of members drawing one ball each. Three balls were differently colored and indicated that the person had to be interviewed. Members who already took part in the baseline or did not participate in the group meetings since at least the beginning of February 2010 were excluded from this lottery. The lottery was skipped if only three or less than three women fulfilled the selection criteria.

¹⁵On the Microfinance group level, the panel (baseline/follow-up) sample contains information on members organized in 363 (399/393) groups divided into 237 (260/249) treatment and 126 (135/127) control groups.

¹⁶More precisely, formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance Institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions. Respondents were not given the option to specifically name mobile banking as a saving device due to its lack of importance and availability at the time of the survey while, in

that an individual respondent may have savings in more than one category in which case she is included in both or all of the categories respectively. In fact, 878 respondents have savings in more than one category while 36 are not accounted for in any of them. Not surprisingly, the most important umbrella category according to Table 2 is informal saving when measured by the proportion of respondents indicating to have at least some savings in one or more of its building blocks (79.2 percent). Formal institutions follow on second place with 64.6 percent. Saving devices at semi-formal institutions are still utilized by 29.3 percent of the respondents. Overall, these categories capture, at least to some degree, the sophistication of the underlying saving devices which form the core of the further analysis. Since one of the goals of the intervention is to promote savings held in more formalized schemes, one expects these variables to be primarily affected in response to program participation.

Albeit not detailed in the table, the most popular saving scheme within the category of formal institutions is offered by Microfinance institutions and banks with a share of 57.5 percent and 39.1 percent of all mentions within this category respectively. Contrary to this, the semi-formal as well as the informal categories are clearly dominated by a single saving device. ROSCAs account for 85.4 percent of the utilized semi-formal schemes and the informal schemes are headed by savings kept at home which received 70.4 percent of the mentions in the informal category. All figures are computed at baseline.

The second part of Table 2 depicts the unconditional average amounts held at the various institutions which are measured as stock variables. Despite the smaller proportion of savers, Table 2 reveals the importance of formal institutions at which most savings are kept. More precisely, savings held at these institutions amount on average to UGX 212,734 compared to UGX 88,964 and UGX 28,597 at their informal and semi-formal counterparts respectively. The last row of this part of the table reports the overall savings to be UGX 330,296 on average. To put things into perspective, the average loan borrowed from BRAC at the time of the follow-up survey amounted to about UGX 550,000.

According to the last part of the table, slightly more than two thirds of the respondents claim that their current level of savings is higher than it was twelve months ago. Moreover, the studied individuals declare their maximum and average weekly savings to amount to UGX 33,652 and UGX 18,973 respectively. These numbers compare best to the weekly income earned by the respondent of roughly UGX 51,900.¹⁷ In addition, 29.6 percent of the respondents report to save on a daily basis. For the effectiveness of the program it is also of importance that 19.3 percent of the respondents announce to take financial decisions alone without the consultation of any other person(s) in or outside of the household. Almost none of the respondents indicates to have no say at all when it comes to financial decision making. It is also noteworthy that none of the differences between the control and the treatment group for any of the variables listed in this table is statistically different from zero which is, of course, reassuring of the random allocation of the treatment status.

6 Results

6.1 Impact on the Saving Behavior

This section investigates the impact of the saving promotion program on the saving behavior of the treatment group. Thereby, the focus is placed on the three categories: savings held formal, semi-formal

contrast, it enjoyed large popularity in neighboring Kenya as documented by Jack and Suri (2011).

¹⁷The implied savings rate of UGX 17,200 calculated by subtracting the weekly household consumption expenditures of about UGX 34,700 from the respondent's weekly earnings matches the self-reported saving rate surprisingly well.

and informal institutions already introduced in the previous section. The first part of Table 3 depicts the estimated impact of the saving promotion intervention, that is δ from equation 1, on the uptake of saving devices across the three different categories. Hence, the estimates are informative about the impact on the extensive margin of making use of at least one of the saving devices in the respective category. All marginal impacts presented in this part of the table are estimated using a Probit model and computed at the mean of the included control variables. The only difference between the columns reporting the marginal effects is the set of control variables used for their estimation.

The first row of the table indicates that the program positively affected the proportion of households with savings at formal financial institutions. However, this effect is measured imprecisely and is not statistically distinguishable from zero. Similarly, the program did not seem to affect the proportion of households holding at least some savings at one of the informal institutions. Each of the estimated effects in the third row is individually insignificant and, in addition, measured to be very close to zero.

Table 3, however, does provide evidence that program participants are more likely to save at semi-formal financial institutions at the time of the follow-up survey or about six months after the program was introduced. Ranging from 8.6pp to 9.9pp, the estimates show that a considerable higher proportion of individuals holds savings at these institutions compared to the individuals in the control group. This finding implies that the promotion program increased the ownership of savings at semi-formal institutions by about 29 percent among treated individuals when considering ownership reported at baseline as the basis (see Table 2).

The second part of Table 3 builds on the same three saving categories but now reports the impact on the amount of savings held at each category. In order to weaken the influence of outliers, the data was trimmed at the top 1 percent in each category including total savings. The estimates are obtained from running the corresponding Tobit regressions and the marginal effects are reported at the mean of the included control variables as well as conditional on holding at least some savings at the respective institutions. In this case, the estimates are, therefore, informative about the intensive margin of saving within categories.

The coefficients show a positive impact on savings held at formal institutions which, however, do not significantly differ from zero. Similarly, program participants appear to decrease the amount of savings held at informal institutions though, again, the effect is measured imprecisely. More meaningful are the impacts obtained for savings at semi-formal institutions which are estimated to increase by UGX 3,677 to UGX 5,761 or by about 13 to 20 percent from their respective baseline values. The finding that merely the amount of savings held at semi-formal institutions are affected by program participation is consistent with the results obtained before on the extensive margin. However, the question of how total savings, a weighted average of the savings held in the three distinct categories, are affected still remains to be answered. The last row of the second part of Table 3 suggests that total savings are not changed in response to program participation. The estimates shown, again, represent the marginal effect on the treatment indicator reported at the mean of the included control variables and conditional on having at least some savings at all.

In conclusion, the savings promotion program appears to have caused a slight reallocation of savings between formal, semi-formal and informal financial institutions. While the usage of formal and informal saving devices as well as the amount of savings held at these institutions is unaffected, semi-formal institutions experience an appreciation in the valuation of program participants.¹⁸ Since total savings remain

¹⁸Although not shown, other household members do not seem to be affected by the program. Repeating the corresponding regressions for their reported savings shows no significant impact and, therefore, intra-household spill-over effects do not

unchanged, however, it seems likely that these increased savings are merely the result of reallocation rather than accumulation. Therefore, the program is somewhat successful in promoting more formal saving schemes but unable to induce an increase in the cash savings accumulated.

6.2 Heterogeneous Impact Assessment

So far, the impact assessment has been limited to the estimation of whether being a member of a Microfinance group that is served by a savings promoter has any influence on variables of interest. The aim of this section is to uncover heterogeneity in the response to the intervention. Hence, the focus is now placed on interdependencies or interactions between treatment and other relevant individual or household characteristics. Consequently, the basic version of the equation to be estimated becomes

$$y_{ijt_1} = \alpha + X_{ijt_0}\beta + Z_{jt_0}\gamma + IA_{ijt_0}\lambda + T_j\delta^1 + T_j \times IA_{ijt_0}\delta^2 + \varepsilon_{ij} \quad (2)$$

where the notation follows the format from before. In case of indicators, δ^2 now measures the impact on subgroups defined by the vector of interaction variables IA_{ijt_0} which goes over and beyond the *genuine* impact estimator δ^1 . Moreover, in order to measure differential impact interdependencies between the treatment status and those events taking place before the baseline as well as those taking place between the baseline and the follow-up survey, the following equation will be estimated where applicable

$$\begin{aligned} y_{ijt} = & \alpha + X_{ijt_0}\beta + Z_{jt_0}\gamma + IA_{ijt}\lambda + T_j\delta^1 + T_j \times IA_{ijt}\delta^2 \\ & + t_1\tau^1 + t_1 \times IA_{ijt}\tau^2 + t_1 \times T_j\delta^3 + t_1 \times T_j \times IA_{ijt}\delta^4 \\ & + \varepsilon_{ijt} \end{aligned} \quad (3)$$

Here, t_1 is a time dummy that equals one if the observation stems from the follow-up survey and zero otherwise. δ^1 measures pre-program differences between the treatment and the control group and δ^3 picks up the genuine treatment effect. δ^4 is now the coefficient of interest. For the sake of clarity, this section will only look at the results obtained for the proportion of respondents using any saving device in the respective financial institution category and will, therefore, disregard the saving amounts. In addition, it seems possible that the self-reported saving amounts suffer from severe measurement error and will thus not be at the core of the analysis. However, the results for the saving amounts are briefly discussed in the Appendix section 7.4. All estimates presented in this section are consequently obtained from running the corresponding Probit regressions.

6.2.1 Theft or Robbery

During both survey waves, respondents were asked to indicate whether specific events named to them have occurred in the recent past. Essentially, all events listed represent shocks with inevitable negative economic implications for the respective household. The event of interest here mentions robbery, theft and civil unrest which serves as a proxy for the security of savings kept at home.¹⁹ At baseline, respondents were asked to indicate whether this event has happened within the last twelve months. During the

seem to play an important role six months after the beginning of program operation. However, the measurement error in the respective outcome variables may be severe due to the limited information a respondent may have on the saving behavior of other household members.

¹⁹Although it is impossible to extrapolate the relative importance of civil unrest in the data, enumerators dispelled concerns that this may be a major factor.

follow-up the recall period was shortened to the last six months. As a reminder, the follow-up survey was initiated roughly six months after the baseline survey and, therefore, the respective indicator variables will be labeled *robbery before t_0* and *robbery between $t_1 - t_0$* out of simplicity. In accordance with the findings by Wright and Mutesasira (2001), theft or robbery are rather commonly experienced events. 25.5 percent of the respondents at baseline and 18.5 percent at the follow-up report to have experienced robbery or theft during the past twelve and six months respectively. 61.2 percent have never experienced this event in the relevant time periods.

Table 4 reports the results from estimating equation 2 (in the first and second columns of each category) and equation 3 (in the third columns) when using the robbery indicators as interaction variables. For the purpose of this study these effects are of special interest as they indicate how individuals in the treatment group differentially respond to the program if they experienced a robbery in the recent past. In the case of formal and semi-formal financial institutions, the first column in each category indicates that the event of a past robbery does matter for the effectiveness of the saving promotion program. Interestingly, while the interaction with robbery prior to t_0 affects the usage of semi-formal institutions, the interaction with robbery between t_1 and t_0 influences the usage of formal schemes. The marginal effects show that the impact of the intervention increases by 16.8pp and 11.4pp respectively when participants have experienced this kind of economic shock. In addition, having experienced a robbery right before the follow-up decreases the probability of having informal savings by 3.5pp. It should also be noted that the positive impact of treatment alone on semi-formal saving device usage is preserved in this setup. When both type of events are aggregated to a single dummy variable for any robbery before the follow-up, only the usage of formal saving schemes is significantly affected by the interaction term between the shock and program participation as can be seen from the second columns in Table 4.

Finally, the third columns present regression results based on the pooled sample of observations from the baseline and follow-up survey. Consequently and as formulated in equation 3, this specification includes additional interaction variables between treatment, robbery and time. The estimated coefficients confirm the results obtained before. That is, robberies between t_1 and t_0 increase usage of formal saving schemes and robberies before t_0 increase usage of semi-formal saving schemes. The magnitude of these effects with 18.6pp and 15.2pp are only slightly higher than those found using the previous specification. Notably, the marginal effect on time interacted with treatment which measures the isolated program impact is indistinguishable from zero.

In conclusion, negative experiences related to the security of savings kept at home may serve as an important trigger for the impact of the saving promotion program. The above analysis shows that individuals are much more responsive to the intervention and act in accordance with its objectives if they have recently been the victim of a robbery. This finding is especially compelling if one recognizes that past robbery can only serve as an imperfect proxy for the security of money holdings (or lack thereof). First, the question on robbery does not explicitly ask about the loss of cash holdings. In fact, any kind of belonging may have been subject to the robbery including savings kept in kind. This may be of importance as, for example, Wright and Mutesasira (2001) find that in their Ugandan sample about 25 percent of the respondents have lost savings in kind due to theft in the previous twelve months. Second, the question does not stipulate a lower bound on the loss incurred allowing for economically indecisive events to be captured by this variable.

6.2.2 Literacy

As a reminder, one of the rationales behind the introduction of the promotion program was the strong belief that the Microfinance members' lack of procedural and product specific knowledge may prevent them from saving at more formal institutions. If one is willing to assume that it is less likely for illiterate individuals to possess this knowledge, quite intuitively, an informational campaign such as the saving promotion program may indeed be especially beneficial to this subgroup. In addition, this claim is supported by one of the main findings in Cole et al. (2011) which shows the importance of literacy for the success of the financial education intervention studied.

Accordingly, the treatment indicator will be interacted with a dummy variable that equals one if the respondent is illiterate and zero otherwise. An individual is coded illiterate if she cannot read and write in any language which is the case for 15.1 percent of the respondents at baseline. Table 5, provides the estimates for the basic specification, namely equation 2, for each of the three different financial institution categories in the first column. In accordance with Cole et al. (2011), the saving promotion program had a much stronger effect on illiterate participants in the case of using formal saving devices. Illiterate respondents in the treatment group are 19.0pp more likely to use these devices compared to their literate peers. It should also be noted that treatment remains an insignificant predictor of usage and so does illiteracy itself. Usage of the other two institutional categories is not differentially affected by the literacy status in the treatment group.

One concern is that the literacy status somehow picks up the measures for shocks related to robbery. Such interdependencies may, for example, originate from a common underlying driving force such as poverty. That is, illiterate individuals may face lower wages or a smaller opportunity set of entrepreneurial activities which in turn causes them to settle in relatively unsafe neighborhoods with higher crime rates and thus makes them more prone to be the victim of theft. In order to address this concern, control variables for the event of a robbery before t_0 as well as between t_1 and t_0 are added to the specification from before. The results are shown in the middle columns of Table 5. The robbery indicators turn out to be poor predictors and the estimated marginal effect on the illiteracy interaction term remains almost unchanged at 18.9pp.

Lastly, in order to elicit a potential interplay between illiteracy and economic shocks from robbery, additional interaction terms between any robbery before t_0 , illiteracy and treatment as well as any robbery before t_0 and treatment are formed and included as additional control variables. The results from the corresponding regressions are shown in the third columns of Table 5. For none of the institutional categories does the triple interaction turn out to be a significant determinant of usage. In fact, the result for formal institutions delivers additional evidence in favor of the complementary influence on the impact of the savings promotion program. Both marginal effects on the interaction terms of any robbery and treatment as well as illiteracy and treatment are statistically significant in this specification with magnitudes almost equal to the results obtained from specifications in which they enter separately. It is straightforward to see this by comparing the effects for illiteracy interacted with treatment in column 1 and 3. For the marginal effect on any robbery interacted with treatment, one has to compare the respective third column estimates of Tables 4 and 5 which in both cases equal roughly 19pp in case of formal financial institutions.

Overall, it can be said that the literacy status of participants in the savings promotion program does seem to have a decisive influence on the success of the program measured by the usage of formal saving devices. Therefore, the assumed existence of knowledge gaps concerning more formalized saving

mechanisms as part of the motivation behind the introduction of the promotion program may indeed point into the right direction. Furthermore, the findings in this section do stand in line with the results obtained by Cole et al. (2011). In fact, even the magnitude of the estimated impact amplifier is broadly consistent with their findings.²⁰ Finally, the results in this section offer a second channel through which a more narrowly defined target group can be selected in order to increase the efficiency of the program.

7 Robustness Checks

7.1 Robustness of the Interaction Results

The two main goals of this section are closely interlinked. First, individual or household level characteristics that have been identified in the literature as important determinants of the saving behavior are being investigated in the context of the savings promotion program and the previous analysis. More precisely, the analysis will focus on three leading explanations for ROSCA participation or rather for the rationale behind joining commitment saving mechanisms. Second, in order to strengthen the result obtained on the implications of a past robbery on the program impact, the focus will be extended to other economic shocks which may have equally triggered a response affecting the saving behavior.

One of the reasons behind the widespread existence of ROSCAs also in East Africa is frequently seen in its potential to directly address limited self-control or commitment problems. Ambec and Treich (2007), for example, show in their theoretical model how agents can prevent the purchase of a superfluous good by committing themselves to frequent installment payments characteristic for ROSCAs. One of the empirical predictions derived in their study is an inverse U-shaped relationship between income and participation in commitment saving devices such as ROSCAs.²¹ Hence, in order to test the importance of this prediction in the working mechanism of the saving promotion program, treatment is interacted with two dummy variables which equal one if the respondent's individual income falls into the bottom or the top part of the income distribution respectively.²² Since the focus is explicitly set on ROSCAs, one would expect these variables to primarily influence participation in semi-formal saving schemes. Table 6, however, shows in the first columns that this relationship is not of great importance in the studied sample.

Closely related, Ashraf et al. (2006b) document a positive relationship between hyperbolic preferences of study participants and the uptake of a commitment saving product.²³ This finding is in line with the assumption that self-aware individuals who exhibit a reversal of time preferences may especially be interested in commitment. In accordance with Ashraf et al. (2006b), hyperbolic preferences are elicited from hypothetical time preference questions asked both during the baseline as well as the follow-up survey.²⁴ Hence, in order to test whether hyperbolic preferences provide any implications for the saving

²⁰Cole et al. (2011) estimate the take-up rate of bank accounts to be 13.9 percentage points higher for unschooled individuals in their treatment group in a comparable econometric specification.

²¹The rationale behind this prediction is based on the poor being too poor to even be tempted by superfluous goods in the first place and the rich having to commit to prohibitively high installment payments in order to be unable to afford the purchase of the superfluous good.

²²More precisely, the indicator for the bottom income equals one if the respondent's individual income falls below the 25th percentile of the income distribution and zero otherwise. The indicator for top income equals one if the individual income falls above the 75th percentile of the income distribution and zero otherwise.

²³Hyperbolic preferences are characterized by a relatively lower discount rate for future compared to current trade-offs.

²⁴More precisely, the two relevant questions are "Would you prefer to receive 10,000 guaranteed today, or 20,000 guaranteed in 1 month?" and "Would you prefer to receive 10,000 guaranteed in 6 months, or 20,000 guaranteed in 7 months?" (the unit of measurement is implicitly thought to be UGX). By definition, a respondent is coded to feature hyperbolic preferences if she prefers to receive 10,000 in the first and 20,000 in the second scenario.

promotion program, the corresponding indicator is being interacted with treatment. The regression results are shown in Table 6. Since the semi-formal saving schemes arguably feature the most pronounced commitment component, the focus should again be placed on them. Besides regulatory sanctioning of members failing to pay their periodic contributions, Collins et al. (2009), for instance, provide extensive narrative evidence on how social capital and social sanctioning can induce commitment into saving clubs such as ROSCAs. A mechanism also described by Gugerty (2007) in her study on Kenyan ROSCAs. However, the column 5 of Table 6 indicate that hyperbolic preferences do not appear to influence the decision of utilizing semi-formal devices of individuals surveyed.

Questioning the notion that a household can be seen as atomistic, Anderson and Baland (2002) derive another empirical prediction for ROSCA participation from the assumption that spouses' preferences for an indivisible good to be purchased in the future may not be aligned, namely women exhibit larger preferences for future consumption of indivisible goods relative to men.²⁵ Thereby, the authors touch upon two critical issues already described above. First, indivisibility already played an important role in the early explanations of the persistent existence of ROSCAs. Second, the line of argumentation brought forward in this study hinges upon the spouses' recognition of the obligation to make periodic contributions to the saving group. Hence, ROSCA participation can be seen in this sense as a collective or household commitment saving device. The resulting empirical prediction postulates an inverted U-shaped relationship between the female weight in household decision making and participation.²⁶ In this analysis, the female share of household income will serve as a proxy for her bargaining power as suggested by the authors. Table 6 shows the results from interacting the relevant indicators with treatment in the third columns of each category. The income share does not appear to have any decisive influence on the decision to save at semi-formal financial institutions.

In summary, none of the three suggested rationales behind the attractiveness of commitment saving devices seems to play an important role in determining the usage of semi-formal saving institutions in the context of the saving promotion program. The positive impact of the interaction term between treatment and high income in case of formal financial institutions may merely indicate that relative wealthier individuals in the treatment group are more receptive for the promotion of the respective, rather costly, saving devices. In contrast, the interpretation of the strong impact on the subgroup of respondents with a high female income share in case of formal institutions is rather ambiguous. It should also be noted that the main results obtained for the subgroups of individuals who are either illiterate or who recently became the victim of theft are preserved in case of formal saving devices.

Although having experienced robbery being a relatively obvious candidate to proxy for the insecurity of cash savings kept at home, it is important to rule out the possibility that the indicator does merely capture an economic shock that leads individuals to reorganize or to reallocate their assets including cash holdings. Table 7 is intended to provide evidence against this hypothesis by reporting the results from Probit regressions taking the effects of alternative sources of economic shock or distress into account. The estimated equations essentially fit into the setup of equation 2.²⁷ As indicated by the respective marginal effects on the interaction term between the shock and treatment, none of these events dampened

²⁵One example providing evidence on meaningful differences between financial decisions taken by spouses is a study by Ashraf (2009). Importantly, the study shows that intra-household bargaining or decision-making power influences how individuals allocate resources depending on whether the outcomes are observable or not.

²⁶Again, the 25th percentile defines the cut-off for the low income-share group and the 75th percentile for the high income share group.

²⁷All indicator variables investigated in Table 7 are defined exactly on the same time periods as the robbery and theft indicator used before. In fact, all variables capturing the event of an economic shock are based on questions with equivalent wording.

or amplified the influence of the saving promotion program on the usage of formal or semi-formal saving devices.²⁸ In consideration of the decisive impact of the interaction term between robbery and treatment on usage of formal institutions (shown in Table 4), these results support the claim that the nature of robbery with its more direct implications for the security of cash holdings outweighs the pure economic shock it equally represents.

7.2 Impact on other Microfinance Group Members

In this section the analysis shifts to the respondents' perception of actions taken by people in their immediate surrounding, namely their Microfinance group. In this context, however, the term Microfinance group will be used for the joint-liability group that each borrower is part of. These smaller, typically self-selected, groups are composed of five Microfinance members. The reason to focus on this group is that it seems somewhat reasonable to assume that borrowers possess relatively more detailed information on members in their joint-liability group. All members within the same group necessarily have the same treatment status.

The first row of Table 8 provides evidence on the programme's impact on respondents' perception concerning how many of their fellow joint-liability group members own a bank account. The estimated coefficients indicate that this perception is not altered by the program. To some degree, this result confirms the finding from genuine impact estimates which established that the proportion of participants with savings at formal financial institutions does not significantly vary with treatment. However, it needs to be noted that banks only form one of the sub-categories contained in the formal financial institutions according to the definition used in this study.

The second variable depicted in Table 8 asks about how many of the other group members participate in ROSCAs or ASCAs. Hence, the named institutions in this question precisely match the categorization of semi-formal financial institutions and thus allows for direct comparison. First, it should be noted that the mean of 1.04 participating members in a group of five implies a take-up rate of 26 percent per member which fits the overall sample average of 29.3 percent rather well (see Table 2).²⁹ Second, program participation significantly increases the perception on how many other Microfinance members take part in ROSCAs or ASCAs. The implied percentage increase by the coefficients range from 7.9pp to 5.7pp per member and are very similar to the previously estimated actual increase in the fraction of respondents' usage rate of saving devices at semi-formal institutions ranging from 9.9pp to 8.6pp (again, see Table 2). Hence, these findings confirm the results obtained before. The third row of the table also indicates that program participants' perception on how many other Microfinance members save regularly is significantly affected (albeit weakly). However, the positive impact on this variable may be based on much less factual knowledge than the first two variables and should, therefore, only be interpreted with extra care.

7.3 Panel Attrition

Table 1 already provided information on whether key socio-economic characteristics considerably differ at baseline between the group of individuals contained in the panel and those who could not be re-interviewed. The only differences with statistical significance are the indicators for the respondent

²⁸For the sake of clarity the category of informal institutions is omitted. The reader may be assured, however, that all the estimated marginal effects on the interaction term for this category are equally indistinguishable from zero.

²⁹Since the respondents were asked about the other members in their joint-liability group, the implied per member rate is calculated by dividing the estimated coefficient by four.

having any formal schooling and ownership of a non-agricultural business as well as the number of household members engaged in an income generating activity. Table 9 shows the results obtained from OLS regressions of an indicator variable which equals one if the respective individual is included in the panel and zero otherwise on different sets of control variables. The coefficient on the treatment status is of special interest as statistical significance would indicate that panel inclusion itself is determined by treatment and, therefore, undermine the comparability between the control and treatment group. However, all coefficients on the treatment indicator turn out to be indecisive predictors of the panel status. In addition, the last two columns of Table 9 depict the coefficients on the interaction variables constructed from the treatment indicator and the typical set of control variables as well as those variables found to differ between panel and non-panel households before. None of the coefficients is statistically distinguishable from zero.

The second robustness check in this section repeats the estimation of the major specifications presented before using weights intended to adjust for panel attrition. More precisely, the weights are constructed to be the inverse of the estimated probability of panel inclusion. Thereby, individuals with a low assigned probability of being included in the panel receive a relatively higher weight in the main regressions based on the panel sample. The procedure followed is outlined by Wooldridge (2002).³⁰ Although, the magnitudes of the estimated marginal effects naturally differ slightly from the previous analysis, all qualitative results and statements remain intact as can be seen from Table 10.

7.4 Saving Amount

This section is dedicated to replicate the results obtained on the intensive margin of saving scheme usage for the savings held at the specific institutional categories. For this purpose, a Tobit model is estimated that essentially builds on equation 2. Table 11 in the Appendix displays the marginal effects obtained for the main specification. All marginal effects are reported at the mean of the included control variables as well as conditional on holding savings at the respective institution. Overall, the table largely mirrors the results obtained for the extensive margin. That is, a robbery or theft up to eighteen months before the follow-up significantly increases the savings held at formal institutions by UGX 36,054. Savings held at semi-formal or informal institutions are unaffected by either of the two robbery indicators and so are total savings.

Finally, the first column of Table 11 indicates that illiteracy when interacted not only positively influences the decision to use formal saving schemes but also affects the total amount held therein. The interaction term with illiteracy boosts the savings in this category by UGX 50,242 but leaves all other categories including total savings unaffected. Overall, it can be conjectured that the shift in the extensive margin caused by program participation in combination with past robberies and illiteracy almost mechanically translates into a corresponding increase of the savings amount held at the respective institutions. In addition, and in accordance with the results obtained on the genuine impact, these changes merely represent reallocations as the total amount saved remains unaffected as indicated by the

³⁰Underlying this procedure is the so-called selection on observables assumption. That is, conditional on a set of observables measured at baseline z_{ijt_0} , the outcome and control variables (y_{ijt_1}, x_{ijt_0}) in the main regressions are independent of s_{ijt} , an indicator which equals one if information on respondent i in group j is available at survey round t and zero otherwise. Here, z_{ijt_0} contains the usual control variables and, additionally, a dummy variable indicating whether the respondent ever had problems paying the installments on her BRAC loan, a distance measure to the next financial institution and interviewer dummy variables as well as dummy variables for missing information in the set of additional variables. Again, following Wooldridge (2002), s_{ijt_1} is then regressed on z_{ijt_0} using a Probit and the entire sample of baseline households. Finally, the main regressions on the panel sample are weighted using the inverse of the predicted probabilities of panel inclusion, $1/\hat{p}_{ijt_1}$.

marginal effects depicted in Column 4 of Table 11.

8 Alternative Impact Assessment

The main section of the analysis was exclusively based on the households contained in the panel sample. This robustness check takes all respondents interviewed at follow-up into account and replicates the principal analysis. Table 12 in the Appendix depicts the results of this exercise and follows the same structure as Table 3. Since there is no baseline household data available for those observations which are not part of the panel, the estimation of treatment effects with additional control variables is omitted. In general, the results confirm the findings on the panel households. That is, the proportion of households with savings at semi-formal institutions increases in response to program participation indicated by the positive and significant marginal effect on treatment shown in the first part of the table. In addition, all estimates on the amount of savings held at formal and semi-formal, depicted in the second part of Table 12, are positive.³¹ The estimated impact on savings held at semi-formal devices is only significant in the specification without any additional branch dummy variables. However, there appears to be a negative and robust relationship between treatment and the amount of savings held at informal institutions which may be seen, in combination with the previous result, as a further indication for a differential allocation of savings between treatment and control households. Again, the total savings are unaffected.

Along the same lines, Table 13 lists the coefficient on treatment in a setup which exploits the panel nature of the sample by differencing the left-hand side of equation1, i.e. the left-hand side of the estimated equation becomes $\Delta y_{ij} = y_{ijt_1} - y_{ijt_0}$. The advantage of this setup is that time-invariant and individual-specific effects implicitly cancel out as the difference is taken with respect to time. Again, the inclusion of t_0 control variables may improve efficiency and all equations in Table 13 are estimated by OLS. On the one hand, the results obtained for the extensive margin, the saving place, confirm the previous conclusions drawn. On the other hand, none of the coefficients on treatment in the case of the saving amounts is significant. It should be noted, however, that the interpretation of these coefficients is different from before as they are estimated on an unconditional set of individuals. That is, the regressions are performed on all panel observations irrespective of whether the individuals hold at least some savings in the respective institution or not.

9 Conclusion

Household-level financial decision making is widely recognized by practitioners and scholars as an important scope for action in the fight against poverty. While much of the emphasis in the past was placed on microcredit, other or additional financial services have increasingly drawn the attention of interest groups. In particular, access to formal saving devices or mechanisms seems to pose an attractive lever for policy makers. Typically, these instruments are assumed to be underutilized in developing countries because of two main constraints faced by the unbanked poor, namely prohibitively high transaction costs and missing information. While especially governments have the opportunity to support the supply side of financial access through policies expanding the depth and breadth of the banking sector, this study focuses on the demand side Saving Mobilization intervention initialized by BRAC in Uganda. The aim of

³¹Analogous to the previous analysis, the reported marginal effects are obtained from running the corresponding Tobit regressions and reported at the mean of the included control variables as well as conditional on holding savings at the respective institution.

this program is to promote secure and affordable formal saving services to relatively poor Microfinance clients as well as to foster a saving culture in general. Thereby, it attempts to tackle the constraint posed by missing knowledge through an informational campaign but leaves the cost constraint untouched.

Building upon a randomized control trial during which 270 pre-existent Microfinance groups were randomly selected to take part in the promotional campaign, individuals in the treatment group are neither found to be more likely to utilize formal saving devices six months after the program introduction nor do clients of formal financial institutions increase the amount of savings held therein. However, semi-formal saving mechanisms, in particular ROSCAs, experience an increased take-up rate of about 9pp in response to program participation. In addition, savings kept at these semi-formal institutions increase by about 13 to 20 percent of their baseline value. Since such an increase, however, can not be verified in the case of total cash savings, it seems most likely that this finding has to be attributed to a reallocation of liquid wealth.

More importantly, however, the evaluation uncovers extensive heterogeneity in the estimated impact. In particular, individuals who have been the victim of a robbery or theft in the recent past are far more responsive to the treatment. A robbery or theft in the past 18 months increases the take-up of formal saving services by almost 19pp in the treatment group. This finding presents direct support for one of the rationales underlying the emphasis on formal saving devices, namely the insecurity of cash savings kept at home. In addition, a further factor motivating the introduction of this program may be validated by the role seemingly played by illiteracy for the effectiveness of the intervention. It is frequently believed that the missing information constraint is binding for at least a subset of potential bank clients and that many of them are additionally likely to be intimidated by the level of formality at which formal financial institutions operate. The analysis indeed finds that illiterate individuals in the treatment group are about 19pp more likely to save at formal institutions six months into the program.

This study provides guidance to policy makers who are concerned about the efficiency of similar saving promotion programs. More precisely, this study identified subgroups which may be especially receptive for informational campaigns such as the Saving Mobilization program and thus may be of importance during the initial target group definition. It also presents novel evidence on how the experience of a recent theft can trigger the willingness of individuals to diversify towards relatively more secure saving devices once additional information on their working mechanism is provided. However, it needs to be noted that all the results obtained are contingent on a relatively short evaluation period of only six months. Hence, the long-term effects of such an intervention remain to be investigated. In addition, this study explicitly forgoes any welfare analysis and, therefore, does not take any standpoint on the desirability or adequateness of such interventions. However, these are certainly research areas which need to be explored further in order to provide comprehensive guidance on policy implications.

Table 1: Baseline Data Descriptive Statistics, Socio-Economic Characteristics

Means/Differences, standard errors in parentheses

Dependent Variable		Mean	Difference		
		Panel (t ₀)	Panel (t ₀)	Entire Baseline (t ₀)	
			Treatment vs. Control	Treatment vs. Control	In-Panel vs. Out-of-Panel
Household Demographics	Household size	5.03 (.048)	-.165 (.136)	-.200 (.117)	-.052 (.057)
	# of children (≤5 years)	.754 (.023)	-.046 (.087)	-.054 (.098)	.013 (.062)
Respondent	Age	33.2 (.222)	-.792 (.748)	-.615 (.510)	-.273 (.461)
	Literate [can read and write=1]	.849 (.009)	.010 (.018)	.014 (.017)	-.022 (.020)
	Formal schooling [any formal schooling=1]	.932 (.007)	.002 (.011)	.008 (.011)	-.021** (.008)
Household Head	Gender [male=1]	.788 (.011)	-.022 (.020)	-.023 (.020)	.004 (.021)
	Age	38.6 (.245)	-1.21 (.781)	-.947 (.540)	-.272 (.593)
	Literate [can read and write=1]	.900 (.008)	-.008 (.020)	-.006 (.016)	-.005 (.019)
Economic Activity	Wage income [yes=1]	.456 (.013)	.013 (.050)	.022 (.046)	.003 (.056)
	Non-agricultural business [yes=1]	.932 (.007)	.003 (.013)	-.002 (.012)	.032** (.011)
	Agricultural business [yes=1]	.467 (.013)	-.014 (.026)	.006 (.022)	-.070 (.049)
	# of members engaged in IGA	1.90 (.017)	-.021 (.021)	-.025 (.027)	.075** (.032)
Social Capital	# of close friends	.478 (.013)	.007 (.025)	-.004 (.019)	-.018 (.050)
	# of people respondent can borrow small amount from [three or more=1]	.472 (.013)	.012 (.033)	.003 (.029)	.027 (.056)
	Time respondent lived in village [always=1]	.553 (.013)	.009 (.023)	.012 (.022)	.056 (.053)
	Welfare	Own housing [yes=1]	.601 (.013)	-.002 (.016)	-.013 (.017)
	Cooking fuel [wood=1]	.376 (.013)	.005 (.034)	-.021 (.043)	.005 (.059)
	Main income source [subsistence farming=1]	.154 (.010)	-.0007 (.019)	.012 (.013)	.016 (.045)
	Total value of assets	7,571,299 (312,230)	-443,787 (765,388)	-443,447 (519,047)	1,295,265 (829,227)
Microfinance Group	Group size	25.3 (.469)	-.787 (.865)	-.720 (.989)	-1.47 (1.75)
	Group mean - number of BRAC loans taken in the past per member	1.65 (.036)	-.006 (.066)	.019 (.083)	-.078 (.111)
	Group mean - days of membership per member	405 (13.0)	-9.98 (22.5)	.901 (23.6)	-51.3 (46.0)
	N	1,437	1,437	1,823	1,823

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. The standard errors on the differences are estimated from running the corresponding least squares regression. N is the maximum number of observations for the respective column. All variables in the "BRAC Microfinance Group" category are group level variables.

Table 2: Panel Data Descriptive Statistics, Saving Behavior

Means/Differences, standard errors in parentheses

Dependent Variable		Mean	Difference
		Baseline (t ₀)	Treatment vs Control (t ₀)
Saving Institution	Savings held at <i>formal</i> institutions [yes=1]	.646 (.013)	.010 (.035)
	Savings held at <i>semi-formal</i> institutions [yes=1]	.293 (.012)	-.003 (.037)
	Savings held at <i>informal</i> institutions [yes=1]	.792 (.011)	-.033 (.029)
Saving Amount	Amount held at <i>formal</i> institutions	212,734 (18,255)	58,040 (40,722)
	Amount held at <i>semi-formal</i> institutions	28,597 (4,137)	-2,142 (9,962)
	Amount held at <i>informal</i> institutions	88,964 (6,163)	-12,942 (14,336)
	Total savings	330,296 (21,198)	42,957 (50,257)
Saving Behavior	Change in savings compared to 12 months ago [more=1]	.677 (.013)	-.032 (.036)
	<i>Maximum</i> cash amount which can be saved per week	33,652 (1,627)	-4,802 (4,425)
	<i>Average</i> cash amount saved per week	18,973 (1,273)	-3,796 (3,097)
	Saving frequency [daily=1]	.296 (.013)	.015 (.039)
	Involvement in financial decisions [deciding alone=1]	.193 (.010)	-.009 (.028)
	N	1,437	1,437

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. The standard errors on the differences are estimated from running the corresponding least squares regression. N is the maximum number of observations for the respective column. The top 1% outliers of all saving amount categories have been removed. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 3: Saving Behavior Impact Assessment on Levels (t₁), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Dependent Variable		ITT Estimate		
		(1)	(2)	(3)
Saving Institution	Savings held at <i>formal</i> institutions [yes=1]	.038 (.041)	.036 (.038)	.042 (.037)
	Savings held at <i>semi-formal</i> institutions [yes=1]	.099*** (.038)	.086*** (.032)	.091*** (.032)
	Savings held at <i>informal</i> institutions [yes=1]	-.001 (.014)	-.002 (.012)	-.002 (.012)
Saving Amount	Amount held at <i>formal</i> institutions	14,655 (12,956)	11,722 (11,332)	13,546 (11,365)
	Amount held at <i>semi-formal</i> institutions	5,761** (2,766)	3,677* (2,052)	3,893* (2,065)
	Amount held at <i>informal</i> institutions	-6,441 (4,818)	-6,106 (4,347)	-6,384 (4,511)
	Total savings	-444 (13,721)	-3,191 (12,556)	-5,495 (12,932)
N		1,437	1,437	1,437
Branch Dummies		No	Yes	Yes
Controls		No	No	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The top 1% outliers of all saving amount categories have been removed. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, illiteracy of respondent, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 4: Impact Heterogeneity by past Robbery on Indicators for holding Savings at specified Institutions on Levels (t_1), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Explanatory Variable	Formal Institutions			Semi-formal Institutions			Informal Institutions		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Robbery between t_1-t_0 x Treatment	.168** (.080)		.078 (.051)	-.065 (.078)		-.039 (.052)	-.035** (.017)		-.079** (.034)
Robbery before t_0 x Treatment	.107 (.069)		.125** (.050)	.114* (.060)		.041 (.044)	.003 (.014)		.040 (.031)
Any robbery before t_1 x Treatment		.143*** (.039)			.024 (.041)			-.002 (.029)	
Robbery between t_1-t_0 x Treatment x Time			.186* (.100)			-.065 (.102)			.002 (.067)
Robbery before t_0 x Treatment x Time			-.105 (.097)			.152* (.087)			-.101 (.068)
Treatment x Time			.026 (.064)			.095 (.062)			.050 (.031)
Robbery between t_1-t_0 x Time			.065 (.050)			.035 (.051)			.055 (.042)
Robbery before t_0 x Time			.258*** (.084)			-.095 (.078)			.019 (.035)
Robbery between t_1-t_0	-.082 (.062)		.021 (.054)	.040 (.065)		-.011 (.056)	.012 (.008)		.0002 (.027)
Robbery before t_0	-.111** (.050)		-.190*** (.054)	-.049 (.047)		-.018 (.052)	-.005 (.009)		-.082** (.040)
Any robbery before t_1		-.138*** (.044)			-.007 (.049)			.002 (.008)	
Time			-.224*** (.049)			-.010 (.047)			.095*** (.028)
Treatment	-.024 (.045)	-.039 (.045)	-.032 (.045)	.071* (.041)	.061 (.043)	-.025 (.045)	.004 (.007)	.004 (.008)	-.034 (.022)
N	1,414	1,414	2,828	1,414	1,414	2,828	1,414	1,414	2,828
Branch Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups in columns 1, 2, 4, 5, 7 and 8 and by and Microfinance groups and time period in columns 3, 6 and 9. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, illiteracy of respondent, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 5: Impact Heterogeneity by Illiteracy on Indicators for holding Savings at specified Institutions on Levels (t₁), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Explanatory Variable	<i>Formal Institutions</i>			<i>Semi-formal Institutions</i>			<i>Informal Institutions</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Illiterate	-.103 (.068)	-.102 (.069)	-.105 (.067)	-.008 (.068)	.004 (.071)	.004 (.071)	-.017 (.028)	-.002 (.011)	-.002 (.011)
Illiterate x Treatment	.190** (.088)	.189** (.089)	.186** (.089)	.012 (.083)	.0005 (.085)	-.010 (.089)	.009 (.038)	-.002 (.017)	-.005 (.020)
Robbery between t ₁ -t ₀		-.047 (.039)			.012 (.036)			-.004 (.006)	
Robbery before t ₀		.033 (.043)			.012 (.040)			-.007 (.008)	
Any robbery before t ₁			-.133*** (.045)			-.013 (.050)			.001 (.007)
Any robbery before t ₁ x Treatment			.189*** (.061)			.087 (.062)			-.011 (.013)
Any robbery before t ₁ x Illiterate x Treatment			-.015 (.121)			.010 (.113)			.045* (.027)
Treatment	.014 (.040)	.016 (.040)	-.060 (.047)	.089** (.034)	.094*** (.034)	.063 (.046)	-.004 (.013)	.001 (.006)	.007 (.007)
N	1,377	1,358	1,358	1,377	1,358	1,358	1,377	1,358	1,358
Branch Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 6: Impact Heterogeneity by Respondent Type on Indicators for holding Savings at specified Institutions on Levels (t₁), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Explanatory Variable	<i>Formal Institutions</i>			<i>Semi-formal Institutions</i>			<i>Informal Institutions</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Respondent with low income	-.083 (.066)			-.026 (.057)			-.023** (.016)		
Respondent with low income x Treatment	.048 (.084)			.096 (.078)			.031 (.019)		
Respondent with high income	.043 (.054)			-.034 (.051)			-.004 (.009)		
Respondent with high income x Treatment	.151** (.075)			.045 (.065)			-.0009 (.016)		
Respondent with hyperbolic preferences		-.011 (.070)			-.064 (.057)			-.011 (.011)	
Respondent with hyperbolic preferences x Treatment		-.005 (.086)			.033 (.070)			-.002 (.018)	
Respondent with low income share			.137** (.060)			-.028 (.051)			.010 (.006)
Respondent with low income share x Treatment			-.087 (.077)			-.014 (.064)			-.005 (.010)
Respondent with high income share			-.017 (.060)			.040 (.055)			-.003 (.010)
Respondent with high income share x Treatment			-.209*** (.077)			-.034 (.074)			-.010 (.016)
Any robbery before t ₁	-.129*** (.045)	-.123*** (.045)	-.127*** (.062)	-.014 (.050)	-.020 (.049)	-.012 (.063)	.0008 (.007)	.0009 (.008)	.0009 (.011)
Any robbery before t ₁ x Treatment	.186*** (.061)	.179*** (.062)	.174*** (.062)	.091 (.062)	.093 (.062)	.088 (.063)	-.011 (.012)	-.010 (.013)	-.011 (.011)
Illiterate	-.097 (.069)	-.116 (.069)	-.088 (.069)	.003 (.071)	.012 (.072)	-.002 (.071)	-.0008 (.009)	-.002 (.011)	.0005 (.009)
Illiterate x Treatment	.179** (.090)	.197** (.089)	.160* (.090)	-.013 (.086)	-.008 (.086)	-.008 (.084)	-.004 (.017)	-.002 (.019)	-.010 (.022)
Treatment	-.100* (.055)	-.057 (.048)	-.032 (.063)	.029 (.051)	.053 (.046)	.037 (.057)	.0007 (.008)	.006 (.008)	.004 (.009)
N	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437
Branch Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 7: Impact Heterogeneity by Economic Shock Type on Indicators for holding Savings at specified Institutions estimated on Levels (t₁), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Explanatory Variable	Formal Institutions							Semi-formal Institutions						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Unemployment	-0.085							.042						
	(.082)							(.065)						
Unemployment x Treatment	.066							-.061						
	(.092)							(.076)						
Livestock epidemic		.0004								-.031				
		(.057)								(.046)				
Livestock epidemic x Treatment		.033								.093*				
		(.064)								(.056)				
Crop disease			-.073							.030				
			(.051)							(.042)				
Crop disease x Treatment			.059							.021				
			(.064)							(.058)				
Accident/illness				-.042							.019			
				(.055)							(.059)			
Accident/illness x Treatment				.039							-.026			
				(.072)							(.066)			
Flood/Drought					-.052							.123***		
					(.046)							(.041)		
Flood/Drought x Treatment					.079							-.014		
					(.062)							(.059)		
Fire						-.056							-.020	
						(.049)							(.047)	
Fire x Treatment						.098							.020	
						(.065)							(.059)	
Other economic shock							-.085							.041
							(.060)							(.053)
Other economic shock x Treatment							.087							.064
							(.067)							(.067)
Treatment	.034	.026	.008	.026	.001	-.002	.009	.103***	.049	.084**	.103***	.100**	.082**	.072*
	(.041)	(.044)	(.045)	(.045)	(.045)	(.044)	(.043)	(.035)	(.038)	(.041)	(.039)	(.043)	(.038)	(.039)
N	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437
Branch Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, illiteracy of respondent, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 8: Impact on other Microfinance Group Members on Levels (t₁), Panel Data

Means/Coefficients [marginal impacts], standard errors in parentheses

Dependent Variable	Mean (t ₁)	ITT Estimate		
		(1)	(2)	(3)
Microfinance Group				
# of Microfinance members with bank account bounded by [0,4]	.813 (.047)	.068 (.096)	.065 (.086)	.069 (.086)
Members				
# of Microfinance members participating in ROSCA / ASCA bounded by [0,4]	1.04 (.064)	.317** (.125)	.226** (.094)	.244** (.095)
# of Microfinance members saving regularly bounded by [0,4]	2.06 (.075)	.256* (.154)	.195 (.123)	.210* (.119)
N	1,437	1,437	1,437	1,437
Branch Dummies	No	No	Yes	Yes
Controls	No	No	No	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, illiteracy of respondent, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration.

Table 9: Effect on Panel Attrition Indicator, Baseline Data

Coefficients, standard errors in parentheses

Explanatory Variable	(1)	(2)	(3)	(4)	(5)
Treatment	-.009 (.034)	-.012 (.032)	-.015 (.032)	.167 (.207)	.069 (.190)
Household size				.006 (.013)	.0005 (.013)
x Treatment					
# of children (≤ 5 years)				-.008 (.028)	-.004 (.026)
x Treatment					
Household head gender [male=1]				-.029 (.059)	-.038 (.054)
x Treatment					
Respondent age				-.004 (.003)	-.003 (.003)
x Treatment					
Respondent always lived in survey village [yes=1] x Treatment				-.015 (.055)	-.007 (.052)
Crop farmer [yes=1]				-.012 (.049)	-.021 (.049)
x Treatment					
# of members engaged in IGA				-.004 (.038)	.007 (.037)
x Treatment					
Microfinance group size				-.002 (.005)	.0003 (.004)
x Treatment					
Microfinance group mean days of membership per member x Treatment				-.00008 (.000)	-.00009 (.000)
Respondent has formal schooling [any formal schooling=1] x Treatment				-.016 (.066)	.002 (.066)
Non-agricultural business [yes=1]				.069 (.085)	.072 (.081)
x Treatment					
Constant	.801*** (.027)	.759*** (.049)	.918*** (.102)	.812*** (.171)	.932*** (.164)
N	1,806	1,806	1,667	1,667	1,667
Branch Dummies	No	Yes	No	No	Yes
Extended controls	No	No	Yes	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, respondent has any formal schooling, respondent has always lived in the same village, household is engaged in crop farming, household has a non-agricultural business as well as the size of the respondent's Microfinance group and its average membership duration.

Table 10: Weight adjusted Impact Heterogeneity by past Robbery and Illiteracy on Indicators for holding Savings at specified Institutions on Levels (t_1), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Explanatory Variable	<i>Formal Institutions</i>			<i>Semi-formal Institutions</i>			<i>Informal Institutions</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment	.045 (.043)	.039 (.039)	-.057 (.048)	.103** (.039)	.098*** (.034)	.075 (.046)	.0009 (.015)	-.0006 (.012)	.006 (.007)
Any robbery before t_1			-.142*** (.045)			-.012 (.051)			.003 (.007)
Any robbery before t_1 x Treatment			.186*** (.062)			.076 (.063)			-.011 (.013)
Illiterate			-.099 (.066)			.010 (.073)			-.001 (.010)
Illiterate x Treatment			.170* (.088)			-.012 (.088)			-.003 (.018)
N	1,377	1,377	1,358	1,377	1,377	1,358	1,377	1,377	1,358
Branch Dummies	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 11: Impact Heterogeneity by past Robbery on Saving Amounts at specified Institutions on Levels (t₁), Panel Data

Coefficients [marginal impacts], standard errors in parentheses

Explanatory Variable	Formal Institutions (1)	Semi-formal Institutions (2)	Informal Institutions (3)	Total Savings (4)
Any robbery before t ₁	-26,555* (15,274)	-1,127 (3,347)	4,901 (6,987)	7,456 (21,753)
Any robbery before t ₁ x Treatment	36,054* (19,661)	7,176 (4,468)	8,162 (9,044)	17,688 (25,920)
Illiterate	-24,542 (18,972)	-154 (4,885)	-1,751 (7,901)	-6,093 (25,781)
Illiterate x Treatment	50,242* (28,279)	-1,227 (5,669)	2,343 (10,491)	22,675 (35,530)
Treatment	-8,053 (13,525)	1,371 (2,838)	-10,178* (5,619)	-15,759 (15,380)
N	1344	1344	1347	1347
Branch Dummies	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The top 1% outliers of all saving amount categories have been removed. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 12: Saving Behavior Impact Assessment on Levels (t₁), Follow-Up Data

Coefficients [marginal impacts], standard errors in parentheses

		ITT Estimate	
		(1)	(2)
Saving Institution	Savings held at <i>formal</i> institutions [yes=1]	.003 (.036)	.0004 (.032)
	Savings held at <i>semi-formal</i> institutions [yes=1]	.075** (.035)	.053* (.030)
	Savings held at <i>informal</i> institutions [yes=1]	.002 (.014)	-.00007 (.012)
Saving Amount	Savings held at <i>formal</i> institutions	5,918 (12,408)	3,084 (10,540)
	Savings held at <i>semi-formal</i> institutions	4,755* (2,837)	2,146 (2,045)
	Savings held at <i>informal</i> institutions	-7,514* (4,057)	-7,313** (3,479)
	Total savings	-5,766 (11,994)	-8,745 (10,061)
N		2,348	2,348
Branch Dummies		No	Yes
Controls		No	No

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The top 1% outliers of all saving amount categories have been removed. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

Table 13: Saving Behavior Impact Assessment on Differences (t_1-t_0), Panel Data

Means/Coefficients, standard errors in parentheses

Dependent Variable		ITT Estimate		
		(1)	(2)	(3)
Saving Institution	Savings held at <i>formal</i> institutions [yes=1]	.028 (.056)	.007 (.042)	.004 (.042)
	Savings held at <i>semi-formal</i> institutions [yes=1]	.102** (.046)	.095** (.042)	.096** (.040)
	Savings held at <i>informal institutions</i> [yes=1]	.032 (.032)	.025 (.030)	.030 (.030)
Saving Amount	Savings held at <i>formal</i> institutions	-17,900 (25,795)	-21,955 (24,651)	-32,818 (25,817)
	Savings held at <i>semi-formal</i> institutions	4,978 (4,254)	4,740 (3,812)	4,390 (3,778)
	Savings held at <i>informal</i> institutions	-3,188 (12,502)	-4,088 (11,466)	-3,765 (11,946)
	Total savings	-31,355 (35,322)	-36,980 (34,404)	-53,344 (35,225)
N		1,437	1,437	1,437
Branch Dummies		No	Yes	Yes
Controls		No	No	Yes

Notes: *** denotes significance at 1%, ** at 5%, and * at 10%. The standard errors are clustered by Microfinance groups. N is the maximum number of observations for the respective column. The top 1% outliers of all saving amount categories have been removed. The controls contain the household size, the number of household members who are aged five or younger, the number of household members engaged in income generating activities, the respondent's age and indicators for male household head, illiteracy of respondent, respondent has always lived in the same village, household is engaged in crop farming as well as the size of the respondent's Microfinance group and its average membership duration. Formal institutions include banks, SACCOs (Saving and Credit Cooperatives) and NGO/Microfinance institutions. Semi-formal institutions include ROSCAs (Rotating Savings and Credit Associations) and ASCAs (Accumulating Savings and Credit Associations). Informal institutions include the workplace, own home, other people (outside of the household) and all other, not previously specified, institutions.

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