ANALYSIS PLAN FOR SMILES 16-MONTH SURVEY

SMILES, Uganda
Pre-Analysis Plan
Sep 12, 2025

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Introduction

This document outlines the plan for analysis of an end-of-program survey of the first cohort of AVSI's SMILES Graduation-style livelihoods program in Uganda, which took place shortly after the end of program implementation, approximately 16 months after the program's asset transfer. The purpose of the study is to evaluate the impacts of different versions of a comprehensive livelihood program among refugees in Kyaka II and Kyangwali settlements as well as among residents in neighboring host communities. We aim to measure impacts on economic activity and well-being of households participating in the livelihood program.

Program implementation took place between July 2023 and July 2025. The end-of-program survey takes place in 2025, shortly after the end of the program, about 16 months after a lump-sum cash transfer.

Study design

After household eligibility assessments by the implementer in the entire study area, we assigned households to a total of 181 clusters with a target of about 60 households based on geography, generally following villages but dividing and combining villages to create the targeted cluster sizes.

Clusters were randomly assigned to Treatment (89 clusters) and Control (92), stratified by geographic areas that contained groups of study clusters and using a rerandomization procedure to balance on a number of household characteristics collected by the implementer as part of the eligibility assessment. Program implementation took place only with households in Treatment clusters.

Within Treatment clusters, households were individually randomized into implementation groups of 26 households on average. Implementation groups were then randomly assigned one of three treatment arms:

- T1 “Large individual asset transfer”: Standard program with individual lump-sum asset transfer ($220[1])
- T2 “Group loan fund”: Standard program like T1 but with smaller individual lump-sum asset transfer ($70) and a transfer of $150 per group member channeled to implementation groups
- T3 “Small individual asset transfer”: Standard program like T1 but with smaller individual lump-sum cash transfer ($70)

After the start of implementation but before assignment of implementation groups to treatment arms, we interviewed a random sample of 6,120 households in Treatment clusters (83% of Treatment households) and 2,115 households in Control clusters (28% of Control households). We conducted a peer ranking and preference survey. Additionally, over the course of the study, we collected administrative data on the implementation groups; in particular, their savings and loan data. Subsequently, we conducted the 16-month follow-up survey.

Analysis

Main research questions

Our main research question is whether we can leverage community knowledge effectively for credit distribution. The key idea is that in T2, groups can decide together who to best allocate capital to. Theoretically, this distribution can be pareto improving. High-ability entrepreneurs obtain more capital and low-ability entrepreneurs participate via interest payments from the loan funds. In order to investigate this hypothesis, we target to answer the following sub-questions:

[1] USD conversions based on 2024 average exchange rate of 3,756.89 UGX per 1 USD, rounded to the nearest dollar.

1. Are community members knowledgeable about each other?
2. What are community members' preferences for capital allocation? (What are pre-intervention characteristics of members who participants prefer to allocate capital to, how unequal is this preferred distribution of capital?)
3. How is capital allocated in groups? (What are pre-intervention characteristics of members the group allocates capital to? How unequal is this distribution of capital? Do members more likely to receive loans have higher returns to capital?)
4. What impact does the group allocation have?

In order to answer questions 1-2, we will primarily utilize the Peer Ranking and Preference Survey. To investigate how capital is allocated in groups (question 3), we primarily utilize the administrative financial data on the implementation groups. Measuring the impact of the product innovation of the group loan fund is the key question of interest, and we will combine the administrative financial data with the end-of-program survey. Below, we provide details on the analysis of question 4, utilizing the end-of-program survey.

Empirical strategy

Estimation of treatment effects will focus on key measures of economic activity and household well-being. Impact estimates will primarily be based on OLS regressions that control for baseline values of the outcomes of interest or their proxies, as well as applicable stratification cell fixed effects and re-randomization variables.

The outcome variables that we will consider for our main analysis are listed below. We classify them into groups of primary outcomes of interest and secondary outcomes. For each group of primary outcomes, we create a summary measure by summing, averaging or otherwise aggregating the different outcomes within an outcomes group. The summary measure is indicated in the list of variables below. We will also winsorize the data if the standard deviation of a variable is more than 50% larger than its 1%-winsorized version.

All outcomes that are not listed as primary outcomes are considered secondary outcomes. These variables will be derived from the attached survey instrument and are not listed individually in this document. We will not do adjustments for multiple hypothesis testing when analyzing secondary outcomes, since these are exploratory analyses. We will report results for the primary analysis pooled and for refugee and host communities separately. In addition we'll analyze heterogeneity of treatments effects using the ML techniques described in Chernozhukov et al (2020)[2] with a set of baseline variables that will include baseline measures of demographic and socioeconomic outcomes. We will also use the randomized group formation to test whether homogeneity of groups and strength of social networks leads to better functioning groups.

[2] Chernozhukov, Demirer, Duflo, Fernandez-Val (2020): "Generic machine learning inference on heterogenous treatment effects in randomized experiments," ArXiv: 1712.04802.

Primary outcomes:

- Consumption per capita ($)
- A food security index
- Value of productive assets (excluding land) ($)
- Value of land ($)
- Value of net financial assets ($)
- Household income ($)
- A subjective well-being index

Consumption per capita

- *Summary measure*: Value of 30-day consumption (=sum of outcomes below), divided by the household's adult-equivalents ($)
- Adult equivalent scale: 1st adult = 1; 2nd-n adults = 0.7; children 0-14= 0.5
- Consumption components:
    - 7-day food consumption ($) multiplied by 4.3
    - 30-day non-food expenditure ($)
    - 12-month non-food expenditures ($) divided by 12
    - 10% of total value of household durables ($) that are not covered in the 12 month non-food expenditures

Food security

- *Summary measure*: z-score index of FCS, HFIAS
- Individual outcomes:
    - Food Consumption Score (FCS) following INDDEX Project (2018), based on number of days in past 7 days household has consumed different major food categories
    - Household Food Insecurity Access Scale (HFIAS) following Coates et al. (2007), based on eighteen questions about incidence and frequency of food security problems in past four weeks

Value of productive assets (excl. land)

- *Summary measure of stock:* Sum of value of sub-components ($)
- Individual outcomes:
    - Value of livestock owned ($)
    - Value of livestock fixed assets ($)
    - Value of common durable assets ($)
    - Value of durable and fixed assets associated with off-farm businesses ($)
    - Value of business inventory (merchandise, unsold finished goods, raw materials, materials that have not been used, incomplete products) ($)
    - Investments in farming on unharvested plots (chemical inputs, hired labor, rent, etc) ($)

Value of land

- *Summary measure:* sum of per-plot values based on survey question about resale value

Value of net financial assets

- *Summary measure:* Current level of savings across categories minus total of outstanding loans plus value of outstanding loans given to others
- Note: Because the way the survey instrument was designed and interpreted by respondents, reported savings do not include block grant shares. Therefore, for T2 group members, we add the block grant shares and accumulated block grant interest shares from the administrative data.

Household income:

- *Summary measure:* Total household income = sum of individual outcomes below ($)
- Individual outcomes:
    - Wages from employment ($)
    - Off-farm business profits ($), based on a direct question about enterprise profit/loss
    - Livestock profits ($), defined as
        - sales (net of shear-rearing arrangements) plus value of animals slaughtered for household consumption and livestock products (milk, eggs, manure, etc) minus livestock expenses and animals purchases
    - Net revenue from farming ($), defined as
        - The value of harvested crops in the last completed agricultural season plus the value of output from non-seasonal crops in the past 6 months (all divided by, for example, 6 months to get the average monthly value) minus the cost of agricultural inputs for crops and fruit trees over the agricultural season (fixed period of 6 months)

Subjective well-being

- *Summary measure*: z-score index of components
- Individual components:
    - Cantril's ladder
    - Kessler-6 score

Indices

For the construction of outcome group summary measures, we will use the methodology detailed in by Kling, Liebman, and Katz (2007), unless the index is a specific index in the academic literature, in which case we will use the method employed in that literature to compute the index. For those concepts without a preconceived index formula, our methodology consists in first signing all variables consistently such that higher is telling a consistent story for the index. Then, we standardize the individual components of the index, by subtracting the comparison group mean and dividing by its standard deviation. Then, we take the average of

the now-standardized components into a single measure, and then again finally standardize the average (again to the comparison group mean and standard deviation).

Data collection and timing of analysis

While data collection was partially completed –about 75%– at the time of submission of this analysis plan, the researchers have generally been blind to the treatment status. An exception is the analysis of survey attrition which was conducted during data collection and included comparisons of attrition rates by treatment status for the purpose of management of potential differential attrition.

Markets System Development (MSD) interventions

To investigate the complementary impact of a Market System Development (MSD) program we cross-randomized the design described above with an MSD implementation. MSD is a bundle of initiatives that aims to crowd-in private sector partners, for instance, to facilitate take-up of modern agricultural inputs (e.g. improved seeds, inorganic fertilizer, best practices). We randomly assigned about 50% of each of the Treatment (42/89) and Control clusters (47/92) of the Graduation RCT above to MSD. Clusters assigned to MSD were a priority for targeting the MSD interventions. However, by the nature of the MSD program, creating and supporting markets, the impacts will in theory not be strictly contained to the cluster assigned to MSD; cluster not assigned to MSD could also have benefited from improved market access.

In principle, the cross-cutting randomization allows us to test the effects of MSD both in the presence and in the absence of the Graduation intervention and the effect of Graduation both in the presence and in the absence of targeting by the MSD programming. However, at this time, we have limited knowledge about compliance of the private sector partner. Thus, our initial tests in this survey round will focus on better understanding compliance, in particular, whether there is a sizable first stage, e.g., with respect to the take-up of agricultural inputs and promoted brands.