Pre-Analysis Plan for "Resilience and recovery: The economic impact of COVID-19 on the informal sector in Uganda"

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1. Introduction

We evaluate the impact of the Youth Opportunities Program (YOP) on resilience against the COVID-19 shock. This pre-analysis plan outlines the hypotheses to be tested and specifications to be used in the analysis of the impact of the YOP intervention in Uganda after COVID-19 shock. This pre-analysis plan was completed by the authors before the data was collected and can thus serve as a useful reference in evaluating the results of the study.

2. Overview of the Study

2.1 Motivation and Program Description

Low-income households in developing countries often lack the financial tools to deal with shocks. Imperfect credit and insurance markets, highly vulnerable income sources, limited savings, and a lack of adequate safety nets to fall back on, make these households disproportionately vulnerable to aggregate shocks, such as the COVID-19 pandemic. In particular, the workforce in the informal sector is vulnerable for economic shocks. In Uganda more than 80 percent of the of the country's workforce are employed in the informal sector, which contributes over 40% to GDP.

The YOP program was initiated by the Ugandan government in 2006 and invited groups of young adults, aged between 16 and 35, to apply for the YOP program. The groups submitted proposals for grants of roughly $8,000 (or $400 per person) for starting individual skilled trades, such as carpentry or tailoring. In 2008, 535 eligible groups for the YOP were randomly assigned to treatment and control group. Chris Blattman, Nathan Fiala, and Sebastian Martinez evaluated the impacts of the program after four and nine years (Blattman, Fiala and Martinez 2014, 2020). After four years, YOP turned out to be one of the most effective employment programs on record. The authors find that most grant recipients invested the cash in skills and materials, started skilled enterprises, and four years later increased their earnings by almost 40%. After 9 years the authors confirmed that the intervention had lasting effects on assets, skilled labor, and whether recipients effectively owned their business, while the positive income and consumption effects proved to be of short-term nature only.

Against this background, we will investigate the impact of YOP on youth's ability to mitigate, adapt to and recover from the COVID-19 shock. The data will be collected during the COVID-19 pandemic using a phone survey. We will survey a sample of 2,700 youth in northern Uganda. These youth are part of the randomized controlled trial in 2008

Using phone survey data, we will estimate whether YOP beneficiaries are more resilient to the global pandemic and consequent economic shutdown. Our main research question is: "Does a cash-based employment program affect the long-term resilience of households to deal with an aggregate shock?" Our primary outcomes will be employment, income, and food security. The randomization of YOP will allow us to causally identify the impacts.

3. Measurement of key variables

The hypotheses we will estimate are the following:

a. H_0/H_a: No long-run impact (positive impact) of YOP on employment for the beneficiary.
b. H_0/H_a: No long-run impact (positive impact) of YOP on the beneficiary's income.
c. H_0/H_a: No long-run impact (positive impact) of YOP on household food security.

A detailed description of the measurement of these variables is provided in Section 6: Appendix.

Next to these three main outcomes, we will also estimate the effect of YOP on subjective resilience, subjective wellbeing, business resilience, farming resilience, safety nets, savings, and remittances during COVID-19.

4. Estimation strategy

4.1 Treatment effect equation to be estimated

The primary treatment effects of interest are simple intent-to-treat effects. We will estimate the program impacts on outcome Y by the intent-to-treat (ITT) estimate via OLS:

$$Y_{ij} = \beta_{ITT} T_{ij} + \delta X_i + \alpha_d + \varepsilon_{ij}$$

Where Y_{ij} denotes the outcome for individual i in group j. T_{ij} is a dummy variable equal to 1 if the individual was part of the treatment group; X_i is the set if baseline covariates; α_d are district fixed effects and ε_{ij} is an individual error term clustered by group. We weight observations by their inverse probability of selection into endline tracking and to correct for attrition.

We will also follow Blattman et al. (2014) and report TOT estimates of the program impacts for key outcomes using assignment to treatment as an instrument for being treated. This is because 11% of groups assigned to treatment did not receive a grant.

4.2 Heterogeneous treatment effects

As in the previous papers, we plan to examine heterogeneous treatment effects by gender.

4.3 Multiple outcomes and multiple hypothesis testing

We will employ three different strategies to deal with the rich set of outcome measures.

First, we group related outcome measures into an additive standardized index, as outlined in the Table in Appendix.

Second, we will also calculate the Family-Wise Error Rate (FWER) adjusted p-values using the Westfall and Young step-down resampling method. The FWER represents the probability that at least one hypothesis out of a family of hypotheses is falsely rejected (type-1 error).

Third, we will also adjust p-values to account for the risk of over-rejecting the null hypothesis. We apply False Discovery Rate corrections to adjust the p-values for multiple inference using Benjamini, Krieger & Yekutieli (2006) two stage procedure for sharpened q-values (Anderson, 2008; Benjamini, Krieger, & Yekutieli, 2006).

4.4 Procedures to be used for missing data and for addressing outliers

We will follow Lin and Green (2016) in treating missing covariates. If no more than 10 percent of the covariate's values are missing; we will recode the missing values to the overall mean (testing sensitivity of estimates to these approaches by comparing results with those obtained from the sample with non-missing covariates). If more than 10 percent of the covariate's values are missing, we will include a missingness dummy as an additional covariate and recode missing values to 0.

Monetary values will be top censored at the 99^{th} percentile to contain outliers.

4.5 Outcomes with limited variation

Questions for which 95 percent of observations have the same value within the treatment group will be omitted from the analysis and will not be included in any indicators or hypothesis tests. If omission decisions result in the exclusion of all constituent variables for an indicator, the indicator will be not be calculated.

4.6 Survey attrition

Attrition is a big concern when conducting phone surveys. We will estimate whether attrition is related to treatment status by regressing treatment status on an indicator for attrition. If treatment is not found to significantly affect attrition at the 10% level, then the estimations will proceed without adjusting for attrition. If treatment is found to significantly affect attrition at the 10% level, we will bound the treatment effect using Lee bounds (Lee, 2009).

5. References

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6. Annex: Measurement of key outcomes

Level	Outcome	Indicator	Survey		Coding
Primary	Economic resilience	Respondent worked for remuneration last 7 days	***E2:*** *In the past 7 days, have you worked for remuneration for at least one hour? By "work for renumeration " we mean any activities you undertook for remuneration, including daily labor, working for wages or in-kind, or working on your own account or running a business, including an agricultural business.*	E2	Dummy with value 1 if respondent worked and value 0 if not.
		Income respondent last month	***E5:*** *For casual labor/salaried employment, what was your wage/salary in the last 4 weeks? By salary I mean the cash that you earned related to activity.* ***E6:*** *For commercial farming/self-employed business owner, what was your profit from this farm in the last month? By profits I mean the cash that you earned minus all expenses related to activity.*	E5+E6	Sum of respondent income in the past month. Coded as zero if respondent did not earn any income in the last month. Coded as missing if one of the subcategories is missing. Top censored at the 99th percentile to contain outliers
	Food Security	Number of days with reduced number of meals or reduced portion size (household)	***FS1:*** *In the past 7 days, how many days have you or someone in your household had to… Limit portion size at mealtimes?* ***FS2:*** *In the past 7 days, how many days have you or someone in your household had to… Reduce number of meals eaten in a day?*	Index(FS1 FS2)	Additive index
Secondary	Subjective resilience	Possibility and difficulty to come up with emergency money	***R1****: Imagine that you have an unexpected need and you need to come up with 100,000 USH. How POSSIBLE is it that you could come up with this amount within the NEXT 1 WEEK?* *Would you say it is very possible, somewhat possible, not very possible, or not at all possible?* ***R2:*** *Imagine that you have an unexpected need and you need to come up with 100,000 USH. How DIFFICULT is it that you could come up with this amount within the NEXT 1 WEEK?* *Would you say it is very difficult, somewhat difficult, somewhat easy, or very easy?*	Index(R1 R2)	Index constructed as average of the two ordinal variables
	Subjective wellbeing	Subjective Economic Status	***W1****: Compared to last year, would you say the economic situation of your household this year has improved, stayed the same or worsene?*	Index(W1 W2)	Index constructed as average of the two ordinal variables

			***W2**: Compared to your neighbors, would you say the economic situation of your household is better than average, about average or worse than average?*		
	Business resilience	Business operations	***E8:** What is the current status of your business?*	E7 E8	Question E8 will be coded as: 0 business remains open as usual, 1 temporarily closed by government mandate, 2 business temporarily closed, 3 business permanently closed) Variable will be coded to missing if respondent does not have a business.
	Farming resilience	Change in farming practices	*For your main crop...*		
			***F4**: Relative to the same season in the last year, how many days did you and your household members spend on this activity on your farm?*	Index (F4-F9)	Additive standardized index of 6 ordinal variables All farming variables are coded to missing if off season or if household does not grow crops
			***F5:** Relative to the same season in the last year, how many days did you hire workers to work on this activity on your farm?*		
			***F6:** Relative to the same season in the last year, how many seeds and inputs (e.g. fertilizer, chemicals) have you used (do you plan to use) for your farm for this crop?*		
			***F7:** Relative to the same season in the last year, how much have you harvested (do you expect to harvest) for your farm for this crop?*		
			***F8:** Relative to the same season in the last year, how are /do you expect prices for this crop?*		
			***F9:** Are you/do you expect to be able to sell your crop in the locations/markets where you usually sell it?*		
	Safety net	Respondent received support to deal with COVID consequences	***C4**: Have you received any food, cash or other support from the government or an NGO since the start of the lockdown (March 17th) that you do NOT usually receive? If so, which type of support?*	Index (C C4 C5)	Additive index of 3 dummies
			***C5:** Have you received any food, cash or other support from anyone else in the since the start of the lockdown (March 17th), that you do NOT usually receive? If so, from which source?*		

	Savings	Amount of savings	***S2:*** *How much of your own money do you have saved in this bank account now?* ***S4:*** *How much of your own money do you have saved with these groups?* ***S5:*** *How much money do you have saved in other locations (Just to clarify, savings do not have to be deposited in an account or formal institution, and they may or may not gain interest. They can be somewhere at home, hidden in a safe place, or with a friend or family member)?*	S2+S4+S5	Sum of respondent savings in bank accounts and saving groups. Coded as zero if the respondent does not have any savings.
	Remittances	Respondent received remittances	***B4:*** *How much (remittances received) in total since the lockdown (March 17th)?*	B4	Total amount of remittances received. Coded as zero if the respondent has not received any remittances
		Respondent sent remittances	***B5:*** *How much (remittances sent) in total since the lockdown (March 17th)?*	B5	Total amount of remittances sent. Coded as zero if the respondent has not sent any remittances