Financial Training of Microentrepreneurs, Mobile Money and Spillover Effects: Experimental Evidence

Helsinki, June 12, 2023 (preliminary version, no WP yet)

Jana Hamdan, DIW Berlin

Tim Kaiser, Universität Koblenz-Landau

Lukas Menkhoff, DIW Berlin and Humboldt-Universität zu Berlin

Yuanwei Xu, Ruhr-Universität Bochum

Motivation

- Financial education (FE), such as a financial training of microentrepreneurs, has a positive effect on financial outcomes, which is significant on average, however with large heterogeneity.
- Thus, efforts to improve effectiveness.
- Here we address this by considering three issues:

  Content: … expanding FE on widespread use of **mobile money (MM)**

  Delivery: … again apply **active learning** (Kaiser and Menkhoff, 2022)

  Spillovers: … analyzing possible **spillover** effects

What we do

- RCT with about 2,200 micro entrepreneurs (at baseline) in Western Uganda
- Timeline: Baseline 02-04/2019; training 09/2019; endline 10/2020-04/2021; i.e. we measure results about 15 months after the FE.
- Training with active learning approach, about 12 individuals per group
- Content: About 5 hours on the use of MM (also in other parts of the FE), saving, investment, borrowing and record keeping.
- Spillover analysis important to improve program efficiency and effectiveness (Angelucci and Di Maro, 2016).
- We study impacts of a financial education program using a two-stage randomized saturation experiment:
  1. Cluster randomization among 108 trading centers (TCs) with 1/2 prob.
  2. [Individual randomization of 50%, 75%, 100% invitation in each treated cluster with 1/3 prob. – not reported here; no effects]

Preview of the main results

- The appropriate use of MM can be improved to a significant degree:
  - incidence of using MM savings increases by 29% (from 18.4 to 23.8%)
  - amount of MM savings increases by more than 50%
  - some business-related use of MM goes slightly up
- Interestingly, effects on increase in formal savings and investments remain. These effects are expected from earlier experience, coeff size is somewhat smaller. However, no significant increase in overall savings.
- There are no spillover effects.

The target group: small micro-entrepreneurs

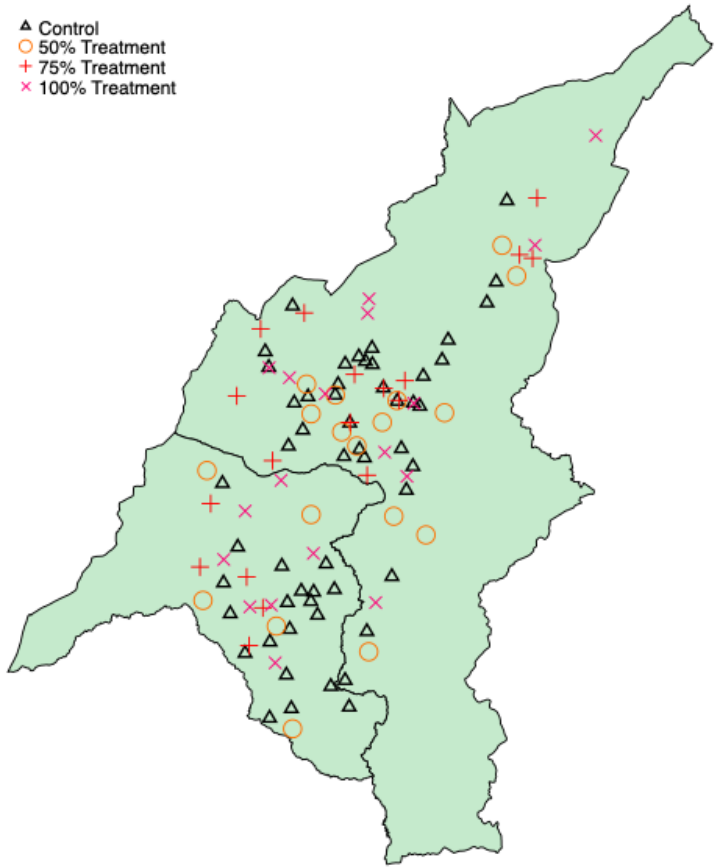
1. The target group are micro-entrepreneurs (MEs) in so-called trading centers (TCs). (only 10% of Ugandans are in formal employment)
2. TCs: Group of shops in the same locality, which means usually along a street. In November 2018 we mapped in cooperation with officials and a local university 113 TCs in the Kabarole district. 108 of them were included in the study
3. There are three kinds of MEs:

   62% have small retail or wholesale shops

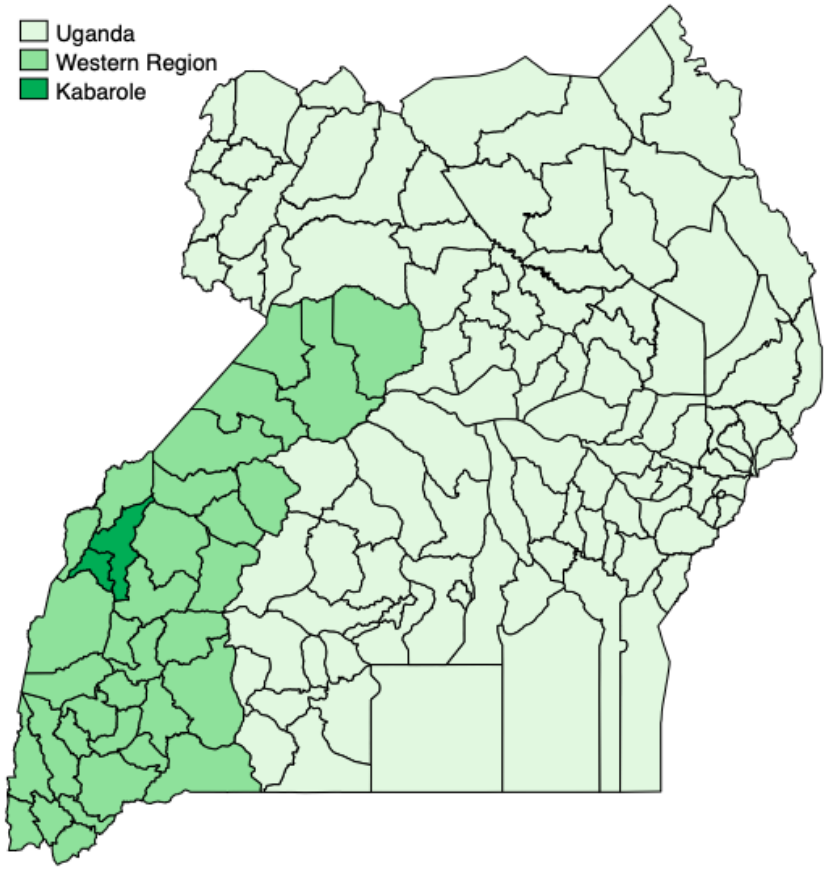
   28% run a service bsuiness, e.g. hair dressing or restaurants

   10% are in manufacturing, e.g., furniture or metal goods production
4. More than 60% are just self-employed; if workers, then 1-4

Study setting in Western Uganda

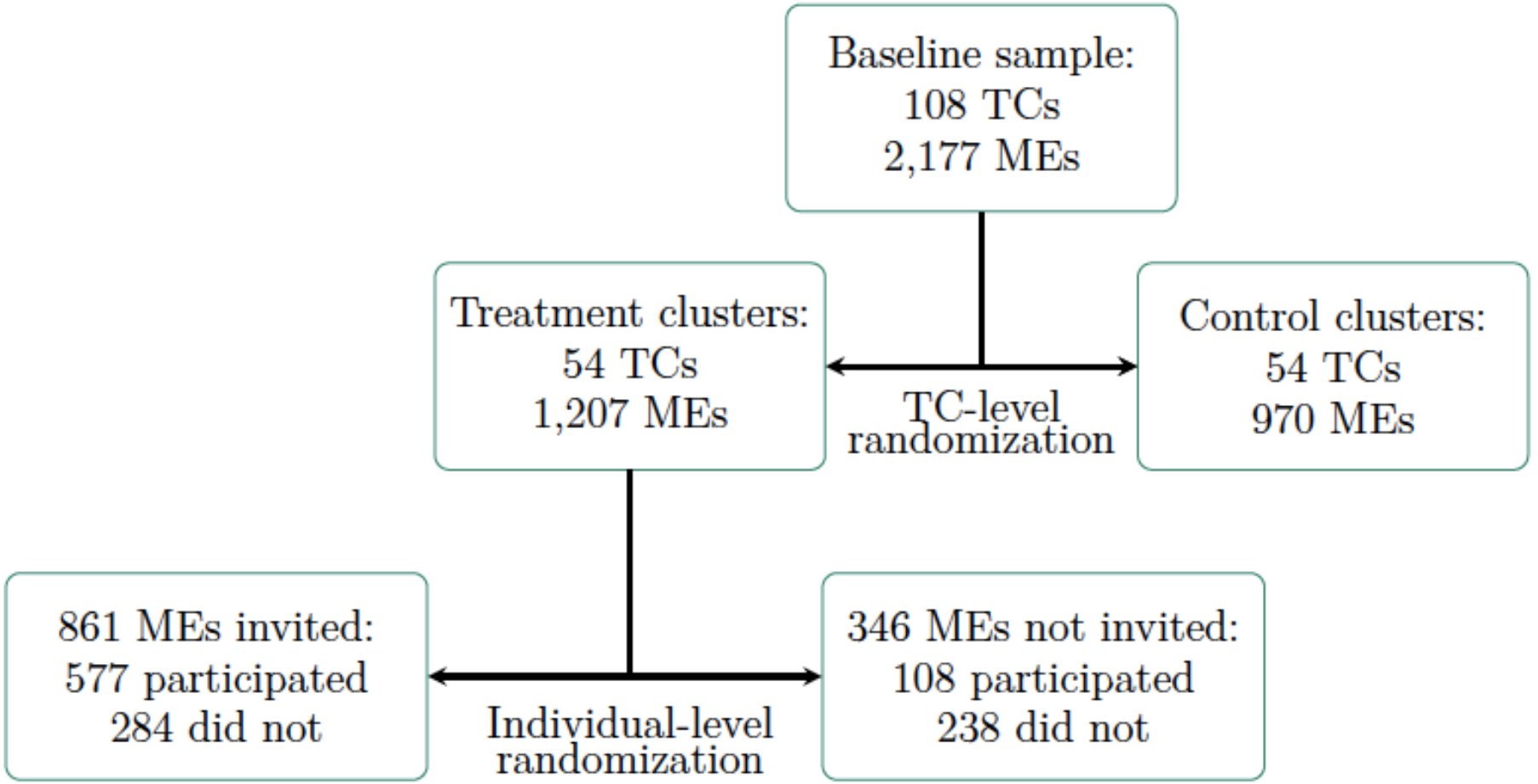


a) Kaberole District



a) Sampled Trading Centers

Randomization process



Attrition and its reasons by treatment status

	Attrition (=1)		Relocation Reason (=1)		Refusal Reason (=1)		Other Reason (=1)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated TCs	-0.038**		-0.030*		-0.003		-0.005*	
	(0.016)		(0.017)		(0.003)		(0.003)	
Assigned to Training		-0.038**		-0.030*		-0.001		-0.006**
		(0.017)		(0.017)		(0.003)		(0.003)
Spillover Group		-0.038*		-0.029		-0.006**		-0.003
		(0.019)		(0.019)		(0.003)		(0.004)
Observations	2,177	2,177	2,177	2,177	2,177	2,177	2,177	2,177
R-Squared	0.015	0.015	0.017	0.017	0.008	0.009	0.009	0.009
Strata FE	✓	✓	✓	✓	✓	✓	✓	✓

Note: The table shows linear regression results with the binary dependent variable attrition in columns (1)-(2) and reasons for attrition in columns (3)-(8). The regression models include strata fixed effects. Weighted by sampling weights and experimental design weights. "Other" reasons include illnesses, imprisonment and death. Robust standard errors, clustered at the trading center (TC) level, are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Correlates of relocation

	Relocation (=1) (1)	Relocation (=1) (2)	Relocation (=1) (3)
Female	0.01	0.01	0.01
	(0.012)	(0.011)	(0.012)
Age	-0.00***	-0.00***	-0.00***
	(0.001)	(0.001)	(0.001)
Work Experience (Years)	-0.00	-0.00	-0.00
	(0.001)	(0.001)	(0.001)
Sales	-0.00***	-0.00***	-0.00***
	(0.000)	(0.000)	(0.000)
Constant	0.18***	0.18***	0.17***
	(0.024)	(0.031)	(0.035)
Observations	2165	2165	2165
R-Squared	0.020	0.033	0.033
Strata FE	–	✓	✓
Inverse Sampling Weights	–	–	✓

Note: The table shows linear regression results with the binary dependent variable being relocation outside of the study region as the reason for attrition. From column (2) onward, the regression equation include strata fixed effects and, in column (3), is weighted by sampling weights and experimental design weights. Sales refer to average daily sales in UGX in the past month and are top coded at 99%. Standard errors are clustered at the trading center level and displayed in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The active learning FE program

1. Mostly conventional content of five intervention areas: (i) savings, (ii) debt management, (ii) business investment, (iv) (budgeting and) record keeping, (v) money transfer.
2. New focus on MM: this is the focus of the intervention area „money transfer“ but is also mentioned in the savings area
3. Active learning approach: (i) speak more (30-60% of time), (ii) discuss with each other, (iii) engage with prepared teaching material such as mini cases, e.g. the money tree, and (iv) show higher levels of physical activity

Discussions during the FE program

Why study spillover effects?

- In search of possible GE-effects: spillovers can enhance or reduce programm effectiveness
- Positive expected: no competition regarding MM use and savings
- Negative expected: Haushofer and Shapiro (2018): unconditional cash transfers in treatment villages in Kenya; document negative spillover on neighbors compared to the control group on consumption and food security in the long term.
- Neg: Crépon et al. ‘13: job placement assistance -> success at cost of non-treated
- Neutral, McKenzie and Puerto (2021): Business education program on small female-led businesses in Kenya; three years after training, the treated businesses are selling more, earn higher profits, and their owners have higher well-being and markets grow, but no significant spillover on the untreated.

➔ We find neutral evidence (most signs are negative)

Empirical approach: conventional ITT

We first estimate the the Intent-to-Treat (ITT) effects of the treatment status at the individual level using the following ANCOVA regression:

$$Y_{isef} = \alpha_0 + \beta_1 Target_i + \beta_2 Spillover_i + \omega Y_{i0} + \lambda_s + \eta_e + \delta_f + \epsilon_{isef}$$

- Y_{ivsef} is the outcome of interest of micro-entrepreneur i located (at baseline) in trading center v and strata s, and interviewed by enumerator e using the interview method f (either phone or face-to-face) in the endline survey; strata and enumerator FE, phone dummy, SE clustered at trading centers.
- β_1 and β_2 measure the impact of the treatment on those who are targeted and the spillover group, respectively; reference group are control trading centers.

Results on MM

	MM Active (=1)	# MM Active (0-4)	MM Saving (=1)	ln MM Saving	MM Transfer (=1)	ln MM Transfer	MM Payment (=1)	MM Supplier (=1)	MM Customer Share
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Control Mean	0.912	1.839	0.184	2.030	0.777	9.348	0.789	0.379	0.037
ITT and Spillover Effects									
Assigned to Training	0.016	0.058	0.054***	0.519**	-0.019	-0.177	0.042*	0.052*	0.012*
	(0.016)	(0.052)	(0.020)	(0.234)	(0.027)	(0.332)	(0.025)	(0.028)	(0.007)
Spillover Group	-0.011	-0.094	-0.015	-0.157	-0.085***	-0.972***	0.023	0.026	0.005
	(0.019)	(0.058)	(0.027)	(0.313)	(0.030)	(0.364)	(0.024)	(0.036)	(0.008)
T = Spillover $(p-value)$	0.127	0.008	0.011	0.031	0.017	0.014	0.464	0.564	0.383
Observations	1,975	1,975	1,975	1,975	1,975	1,975	1,975	1,975	1,975
R-Squared	0.101	0.137	0.070	0.072	0.078	0.086	0.162	0.144	0.131

Note: Table shows regression results, controlling for the lagged variable, dummies for missing values, enumerator FE, face-to-face interview dummy, and strata FE. Weighted by sampling weights and experimental design weights. Standard errors are clustered at the trading center level and displayed in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results on further outcomes

	Saving (=1)	ln Saving	Formal Saving (=1)	ln Formal Saving	Loan (=1)	ln Loan	Formal Loan (=1)	Invest (=1)	ln Invest	Record (=1)	Separate Personal (=1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Control Mean	0.849	10.869	0.176	2.171	0.791	10.078	0.085	0.763	10.149	0.506	0.589
ITT and Spillover Effects											
Assigned to Training	0.015	0.154	0.046**	0.560**	-0.023	-0.358	0.022	0.040*	0.495*	0.011	0.018
	(0.020)	(0.265)	(0.020)	(0.263)	(0.021)	(0.246)	(0.014)	(0.021)	(0.288)	(0.028)	(0.026)
Spillover Group	-0.017	-0.341	-0.002	0.006	-0.021	-0.455	0.000	0.001	-0.038	0.010	-0.013
	(0.022)	(0.314)	(0.021)	(0.279)	(0.024)	(0.290)	(0.018)	(0.028)	(0.376)	(0.031)	(0.022)
T = Spillover $(p-value)$	0.100	0.076	0.047	0.073	0.954	0.720	0.255	0.097	0.099	0.970	0.136
Observations	1,975	1,975	1,975	1,975	1,975	1,975	1,975	1,975	1,975	1,975	1,975
R-Squared	0.075	0.083	0.101	0.088	0.061	0.071	0.059	0.157	0.163	0.118	0.112

Note: Table shows regression results, controlling for the lagged variable, dummies for missing values, enumerator FE, face-to-face interview dummy, and strata FE. Weighted by sampling weights and experimental design weights. Standard errors are clustered at the trading center level and displayed in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Robustness

- Main analyses without weight adjustments
- Cluster-level ITT (tentatively weaker results of the treatment)
- LATE results, comparing compliers to defiers; participation instrumented by invitation (tentatively stronger results)

Summary of findings

1. The appropriate **use of MM improves** , e.g. incidence of using MM savings increases by 29% (from 18.4 to 23.8%)
2. Also positive effects on **increase in formal savings and investments**. These effects are expected from earlier experience, coeff size is somewhat smaller.

   But NO sign change (but signs as aimed for) in overall savings, debt taking ad record-keeping
3. **No evidence of spillovers**.