

**Rural Poverty Reduction Strategies in sub-Saharan Africa: Market Substitutes
for Agricultural Input Subsidies
A Case of Microfinance in Tanzania**

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Motivation

- Modern inputs plays a key role in increasing farm outcomes: yield, wages, and eventually reduce rural poverty in developing countries.
- AISs are used in promoting the use of modern inputs among smallholder farmers to increase (Very popular in the 1970s in SSA).
- AISs are currently unpopular among economists because;
- (a) Significant public funding is required (Ricker-Gilbert et al., 2013)
- (b) Elite capture (Pan & Christiaensen, 2012)
- (c) Rent seeking (Lipton & Ravallion, 1995)
- (d) Funding should be directed in other high-return projects (Morris et al., 2007)
- A need to replace them with market based pro-poor alternatives
- **Can microfinance be that alternative?**

Methods

- We use observational data from the National Panel Survey in Tanzania to estimate income function of the following form;
- $Y = f(\mathbf{S}, \mathbf{M}, X, C, \mu)$ (1)
- S and M are potentially endogenous: selection bias and unobservables
- Participation in S focused on poor smallholder farmers (non-random)
- Participation in M is through self selection (non-random):(SACCOS, microfinance banks, other microfinance institutions, and VICOBA)
- **I use Correlated Random Effect with Control Function (CRE-CF)**
- $Y_{it} = \beta_1 S_{it} + \beta_2 m_{it} + \beta_3 X_{it} + \beta_4 c_{it} + \beta_3 \bar{x}_{it} + \beta_4 \bar{c}_{it} + \beta_5 \hat{\pi}_{sit} + \beta_6 \hat{\pi}_{mit} + \mu_{it}$
- Instruments: **S**: Access to input retailers in the village, a visit by the MP in the village; **M**: Number of Borrowers from all sources of credit (formal & informal)

Data

- Data from Tanzania's National Panel Survey (NPS).
- NPS regarding the welfare of its baseline sample of 2008/9 (Wave 1)
- Specifically focus on farmers involved in maize and rice farming, primarily targeted by the subsidy scheme, NAIVS, 2008-2014
- Three waves are used here Wave 1 (2008/9), Wave 2(2010/11), Wave 3(2012/13)
- Only households involved in the target crops are considered
- Wave 1= 1,600 , Wave 2= 1,812 , Wave 3 =2,310
- Sampling weights are used to correct for attrition

First-Stage Regression

Table 1: Determinants of the Value of Input Vouchers and Microcredit

	(1) Pooled OLS	(2) Pooled OLS
	Ln value of vouchers	Ln microfinance
Farm input retailer in the village (1/0)-IV1	0.410*** (0.072)	-0.040 (0.082)
Member of parliament visiting the village (1/0)-IV2	0.158* (0.081)	0.011 (0.085)
Number of borrowers sources in the district-IV3	-0.018 (0.008)	0.115*** (0.011)
Control Variables (CVs)	Yes	Yes
Time fixed effect	Yes	Yes
Agricultural zones fixed effect	Yes	Yes
Constant	5.301*** (0.456)	0.387 (0.466)
R-sq	0.127	0.058
N	5722	5722

Table 2: Income Function

	(1) CRE (Naïve)	(2) CRE-IV	(3) CRE-CF
Dependent Variables	Ln income per capita	Ln income per capita	Ln income per capita
Ln microfinance	0.069*** (0.006)	0.190*** (0.050)	0.195*** (0.045)
Ln value of vouchers	0.015** (0.007) (0.005)	0.219* (0.114) (0.006)	0.193** (0.093) (0.006)
Control Variables (CVs)	Yes	Yes	Yes
Residual from input voucher function			-0.179* (0.094)
Residual from microfinance function			-0.128*** (0.045)
Time FE	Yes	Yes	Yes
Agricultural Zones FE	Yes	Yes	Yes
Constant	11.632*** (0.270)	10.451*** (0.681)	10.570*** (0.540)
R-sq (Within)	0.0473	0.030	0.079
N	5722	5722	5722
Wald Test: chi2	30.61***	0.07	0.01
Cov (residual vs IV1)	0.016008		
Cov (residual vs IV2)	0.008706		
Cov (residual vs IV3)	0.111341		

CVs: Sex, age, and years of schooling of the household head, Size of the workforce, number of livestock, distance to headquarter of the district (km), distance to nearest major road (km), number of farm of cooperatives in the village, and average Temperature in the area (°C)

Table 3: Income Function: Heterogeneity Across Poverty Status, CRE-CF

	(1) Poor households	(2) Rich households
	Ln income per capita	Ln income per capita
Ln value of vouchers	0.207* (0.107)	0.132 (0.237)
Ln microfinance	0.153* (0.082)	0.115** (0.052)
Control variables	Yes	Yes
Agricultural zones FE	Yes	Yes
Agricultural zones FE	Yes (0.607)	Yes (1.617)
R-sq (within)	0.088	0.047
N	4342	1380
Wald Test: chi2	0.31	0.02

Conclusions and Policy Recommendations

- AISs and microfinance are effective in poverty reduction
- Both are pro-poor
- The both programs on household income are statistically comparable
- Microfinance can serve as an alternative to AISs
- Operations of MFIs should be geared toward social finance ie enhanced outreach to the poor in rural areas.