





Evidence in Agriculture: Credit for Smallholders

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Overview

- Introduction to ATAI/J-PAL
- Smallholder credit constraints on agricultural technology adoption
- Adapting the microfinance model for smallholders
- Digital financial services for smallholders
- Emerging insights



J-PAL affiliates have conducted over 75 randomized evaluations on agriculture





Since the start of ATAI

Category	Total
Farmers surveyed	111,351
Female farmers surveyed	47,845
Farmers whose behavior has changed	17,932
ATAI Awards	63
Unique ATAI projects	48
Countries with ATAI projects	15
Researchers on ATAI projects	90+

Cereal Yields (Metric Tons/Hectare)



Fertilizer Use (Kilograms/Hectare)



What is hampering technology adoption?

Inefficiencies constraining tech adoption

- 1. Credit markets
- 2. Risk markets
- 3. Information
- 4. Externalities
- 5. Input and output markets
- 6. Labor markets
- 7. Land markets

Traditional microcredit and farmers' credit needs

Credit constraints in action



There is no credit available



Farmers struggle to save income from one harvest to the next



Farmers don't have collateral to back a loan



Farmers lack financial literacy

Policy lesson preview: credit for smallholders

- Farmers' credit needs are different from urban microcredit customers
- Take-up of traditional credit products is often low
- Successful credit interventions
 - Reduce risk for lenders
 - Account for seasonal variation in income (and prices)
- Credit constraints exist, but may not be the primary barrier to increasing profitability

Microcredit, broadly speaking

- Traditional model
 - Immediate repayment
 - Group liability
 - Mostly women
 - Mostly urban poor



Key findings on microcredit

- From seven RCTs, researchers lacksquarefound
 - Modest demand
 - Increase businesses activity
 - No impact on income, social well-being



TARAS PASTUSHCHUK, TINA ABI HACHEM, SERGEY ZENZIN NOUNPROJECT.COM

Despite limited social impact lacksquarethere are vibrant, selfsustaining markets for urban microcredit

Agricultural credit for smallholders is different

- Few self-sustaining agricultural credit markets for smallholders have emerged
 - Traditional microfinance model is inappropriate; difficulties in transplanting it to agriculture
 - Few agriculture-specific products
 - Low demand from farmers

Three factors affecting smallholder credit needs

- Negative correlation of production and prices
- Aggregate (not idiosyncratic) risks
- Seasonal cycles to production and prices

Seasonal cycles to production and prices



Take-up is low



Morocco: 17%, with no other lenders in the area

Sierra Leone: 25%, 50% lower than break-even rate





Beaman et al. 2014, Casaburi et al 2014, Crepon et al 2015

So how can we make credit work?

Successful credit interventions often provide improved information about borrowers

Fingerprinting borrowers in Malawi

- Lack of information makes banks unwilling to lend
 - Cannot credibly threaten to cut off future credit
- Treatment group fingerprinted during application process
 - Biometric identification cannot be lost, forgotten, stolen



Gine et al. 2011

Particularly effective for high risk borrowers



*Borrowers are divided into quintiles according to initial their predicted risk of default

Gine et al. 2011

Successful credit interventions often account for farmers' collateral constraints

Flexible collateral

- Land may be an unacceptable form of collateral in smallholder agriculture
 - Banks: titles unclear, seizure under default costly & difficult
 - Farmers: Loss averse
- However, many large agriculture investments can be self-collateralizing (leasing)
- Warehoused grain as collateral

Pender 2008, Basu and Wong 2012; Burke 2014; Casaburi et al. 2014

Rainwater harvesting tanks in Kenya

• Tanks for dairy farmers to collect water for cattle

- Variations in loan offers
 - Standard: 100% secured
 - 25% deposit, tank as collateral
 - 4% deposit, 21% pledge from guarantor, tank as collateral
 - 4% deposit, tank as collateral



De Laat et al. 2015

Increased take-up without harming lender's profits



De Laat et al. 2015

Rainwater harvesting tanks in Kenya

- Changes in time use
 - Girls spent less time fetching water
 - Boys spent less time tending livestock
 - Girls' school enrollment increased by 4% from base of 95%
- Testing concept in Rwanda
- Scoping expansion in Kenya

Successful credit interventions often account for seasonal distribution of farmer income

Designing products for seasonality

- Delaying repayment of loan until after harvest
- Loans for consumption during "hungry season"
- Storage loans to allow farmers to take advantage of price fluctuations
- Savings products to save from harvest until planting time

Harvest-time loans in Kenya

- Loans allowed farmers to:
 - Buy/keep maize at low prices
 - Store while prices rose
 - Sell later at higher prices
- Temporal arbitrage increased profits
 - Concentrated in areas where fewer farmers offered loans



Burke 2014

Inventory credit in Sierra Leone

- Palm oil prices rise 50%
- Two storage interventions
 - Storage assistance
 - Inventory credit
- Low take-up
 - 25% for loan
- No impact on storage, profits



Casaburi et al 2014

Digital financial services may help connect farmers to markets and lending institutions

Digital financial services (DFS)

- DFS has the potential to address some barriers to credit for smallholders
- Lender needs:
 - Facilitates credit scoring based on previous transactions
 - Reduces travel costs of reaching farmers
- Farmer needs:
 - Affordable credit for investment
 - Cost-effective, safe, and convenient method for savings

E-warehousing in Kenya

- Ongoing evaluation since 2013 with maize farmers
- Farmers given:
 - cell phone,
 - access to harvest storage loans,
 - access to an electronic warehouse to bulk grain
- GPS checks on location of grain
- Village-level joint-liability on collateralized grain
- Simultaneously addresses farmer liquidity, lender risk, and seasonal price variation
- Results pending: initial indicators good

Mobile Money in Mozambique



Batista et al. 2015 (preliminary)

Mobile Money in Mozambique

- Effects of savings bonus
 - Increased use of mobile money, including deposits
 - Increased non-frequent expenditures
 - Increased probability of fertilizer use
 - Decreased social pressure to share resources
- Effects of social network
 - Increased use of mobile money
 - Decreased social pressure to share resources



Batista et al. 2015 (preliminary)

Digital financial services (DFS)

- Challenges
 - Lack of penetration of mobile services/money
 - Best suited for places where DFS is already common
- Little evidence on impact to date
 - Being tested around the world

Policy insights on credit for smallholders

Credit can affect agricultural activity...

- Mali
 - Households offered loans spent more on fertilizer, insecticides
- Morocco
 - Loans used to invest in agriculture and husbandry (purchase cattle or sheep)
- Kenya
 - Farmers switched to higher-value export crops
- Malawi
 - Farmers allocated more land to paprika, a cash crop

Ashraf et al 2009; Beaman et al 2015; Crepon et al 2015; Yang et al 2012

... but inconclusive evidence on profits

- Mali
 - Cash grants increased farm profits; loans increased value of output but not profits
- Morocco
 - Agricultural income increased, other sources decreased
- Kenya
 - Temporal arbitrage increased profits
- Sierra Leone
 - Storage loans had no effect on profits

Beaman et al 2015; Burke 2014; Casaburi et al 2014; Crepon et al 2015

Maybe credit is not smallholders' binding constraint

- Compared cash grants, weather index insurance, or combination in Northern Ghana
- Investment and activity increased about equally in groups given cash and groups given insurance
 - When risk constraint relieved, farmers were able to find credit from other sources
- Hence, credit not binding!



Summary: Credit

- Farmers' credit needs are different
- Take-up is often low
- Promising interventions
 - Reduce risk for lenders
 - Account for seasonal distribution of income
- Access to credit affects farm activities, but mixed evidence on profit suggests
 - Other constraints may be binding
- Risk is a dominant issue for credit
 - insurance and credit likely to need to be grown hand-in-hand







Thank you!

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