Risk Management Tools for Agricultural Growth and Resilience

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Annual Innovation Lab Council Partners Workshop
Kathmandu, Nepal
March 10-11, 2014
Technology Adoption for Improved Welfare

Theme of the Innovation Lab workshop:
- Scaling Up Agricultural Research and Technologies
- Designing Research for Improved Nutritional Outcomes

Two Components:
- Mechanical
- Behavioral (Focus of BASIS)

Problem: New technology does not equal technology adoption.
- There are often economic constraints to technology adoption.
  - e.g. credit, insurance
- How can we relax those constraints?
Potential Impacts of Insurance

1. Relax risk & capital constraints to the adoption of “better” technologies
   - Cotton in Mali
   - Maize in Ghana

2. Protect assets, both current & future
   - Index based livestock insurance (IBLI) in Kenya impacts on asset protection
   - IBLI impacts on consumption smoothing protect future assets

3. Incentivize productive asset accumulation over time
   - Alter poverty dynamics
Risk and capital constraints: Cotton in Mali

- Farmers report reducing financial risk exposure by diversification:
  - Grow less cotton or invest less in production inputs
- Farmers access credit via group loans
  - Consequences of default are substantial (informal collateral)
- Joint liability itself discourages investment
  - Output can be taxed away to pay for others in the group
- Problem: Risk keeps these farmers poorer than they need be given the economic opportunities available
- Elabd et al. (preliminary) findings from cotton insurance in Mali:
  - Identification based on “perception” or “understanding”
  - Insurance expands area planted by 20%
  - Insurance increases input use by 10-20%
Risk and capital constraints: Maize in Ghana

Karlan et al. findings from Ghana: Capital vs insurance?

- Identification via random offers of insurance at variable prices
- Insurance increases area planted
- Insurance increases input use
- Capital grant increases input use
- Insurance with capital grant together further increases input use
Protect assets, both current & future: Livestock in Kenya

- Drought is the main risk faced by pastoralists in northern Kenya.
- During and after drought, households face difficult choice:
  - sell off remaining livestock (at a low price)
  - reduce consumption
- Both strategies undercut future productivity.
How does drought insurance work for pastoralists?

- Drought insurance for livestock launched in January 2010
- International Livestock Research Institute, Cornell University, Syracuse University and the BASIS Research Program at UC Davis.
- “Index-based”: uses satellite-based NDVI (normalized difference vegetation index) measures of available vegetative cover to predict livestock mortality
Timeline of Events

- Standardized NDVI
- Household Survey R1
- Household Survey R2
- IBLI Sale
- Index Triggered: IBLI Payouts Made

Year:
- 2009
- 2010
- 2011

Quarters:
- Q3
- Q4
Drought in 2011 triggered index: Insurance Payouts made
Protect assets, both current & future: Livestock in Kenya

1. Identification via random offers of insurance at variable prices
2. 36 percentage points less likely to anticipate drawing down assets → larger for consumption smoothers
3. 27 percentage points less likely to anticipate reducing meals → larger for asset smoothers
Incentivize productive asset accumulation over time
Insurance Changes Dynamics of Poverty

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Thank you!