Risk Management and Investment Decisions

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Overview of Presentation

- The briefest introduction to rainfall insurance
- Challenges in marketing rainfall insurance
- (How) does risk management affect investment decisions?
What is Index Insurance?

Financial derivative which pays out if rain falls below pre-specified deficit

Pros:
- No moral hazard, adverse selection, or claims verification costs
- Easily re-insurable

Cons:
- Basis risk
- Complicated, hard to understand and evaluate
- Typically requires payment in advance
Demand is often low; price matters
High cost and distrust prevented farmers from purchasing formal insurance in India and Ghana

Cole et al., 2013 (India); Mobarak and Rosenzweig 2014 (India); Karlan et al., 2014 (Ghana)
Challenges with Take-Up

- Cole et al. (2013)
  - First experimental study of index insurance (2006)
  - Demonstrates low adoption, in general (5-20%)
  - Even when price is better than actuarially fair
  - Trust and liquidity key barriers to adoption

- Gaurav (2013)
  - Financial education can boost demand, but very expensive
The most profitable crops are highly sensitive to rainfall.

Cole et al., 2017
Academic Work on Insurance and Investment

- Cole, Gine, and Vickery (2013) - Andhra Pradesh
  - Grant ten insurance policies worth $25 to treatment individuals, expected value of policies to control
  - Randomly assign to 750 fo 1,500 households at village level

- Karlan et al. (2012) - Ghana
  - Grant of insurance, cash, or insurance and cash, plus control
  - Subsequent sale of insurance

- Mobarak and Rosenzweig (2012)
  - Sale of subsidized insurance, random variation in price
Effect of Insurance on Investment Decisions

- Cole, Gine, and Vickery (2013)
  - Measure of risk: planting cash crop
  - Impact: increased probability of planting cash crops from 48% to 54%

- Karlan et al. (2014) -- Ghana
  - Insurance increases investment, with or without credit, by about 8 percent
  - Credit (alone) does not!

- Mobarak and Rosenzweig (2014)
  - Farmers in India purchasing more insurance planted riskier (but more profitable) varieties of rice
Conclusions on Risk-Taking

- Three consistent studies, in different contexts (Andhra Pradesh; Ghana; many states in India) provide similar findings: being insured leads to more profitable investment decisions

- Effect sizes are relatively modest, but Binswanger and Rosenzweig (1993) estimate effect size could be as large as 35 percent of income for poor households

- From an implementation perspective, important challenges remain
  - High marketing costs
  - Basis risk
  - Farmer trust and comprehension
A Cautionary Tale

- Evaluate willingness to pay of 2,000 farmers for four different policies
  1. Actual Policy
  2. Lower payment per mm deficit
  3. Exit payout more likely
  4. Basis risk
A Cautionary Tale

- Average farmer bid for policy was higher than “cost” of producing
- Farmers adjusted bid up (down) when value of policy increased (decreased)
- Size of adjustment not related to value of adjustment
- May be difficult for competitive market to work
Conclusion

- Risk matters, a lot, to farmers
  - Especially spatially correlated risk like weather insurance
- Financial engineering can reduce risk exposure
  - (But does not change the weather!)
- Index-based products may be dramatically improved
  - Yield could be based on village-level drone measurements, etc., reducing (but not eliminating) basis risk
  - Sale of policies and claims payout done by mobile money
  - Government “auctions” could yield sensible products at relatively low prices (e.g., India)
  - ...but individual adoption will likely be very low for quite a long period of time
  - Other parties may be better suited to purchase insurance