Interlinking Insurance and Product Markets
Experimental Evidence from Contract Farming in Kenya

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IGC Growth Week
Sep 25, 2014
The Promise of Agricultural Insurance

Smallholders' incomes exhibit high volatility
- Volatility income $\Rightarrow$ volatility consumption
- Limited consumption smoothing ability

Correlated Shocks
- Poor risk-coping via risk-sharing within local social networks

Risk affects investment choices
- Farmers who take-up insurance increase investments
For the most part, small farmers show low demand for insurance

- Few farmers sign up when offered actuarially fair insurance
- Rates stay low even with large subsidies
- Exception Karlan and Udry (2014)
1. Risk Preferences

- Basis risk ("index insurance")
- Difficulty in understanding the product
- Trust
- Overconfidence
- Informal insurance (Mobarak and Rosenzweig, 2014)
2. Intertemporal Preferences and Constraints

- Canonical insurance is **static**: risk-reduction by transferring income from good states at $t_1$ to bad states at $t_1$
  - Static theories of risk-sharing and insurance demand

- Insurance products: premium at $t_0$ for a payout in bad state at $t_1$
  - Forcing illiquid savings to get risk reduction
  - Activating **inter-temporal distortions**, such as credit constraints or present bias (Sarris, 2002)

- A potential explanation for this gap: **enforcement concerns**
  - Hard for a third party insurer to obtain payment from the farmer after a good harvest
  - What if the insurer were the buyer?
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Interlinkages in Agricultural Markets

- **Interlinked transactions**: agents contract on multiple markets
  - Product, credit, insurance, and labor markets
  - Synergies: lower monitoring costs, better enforcement

- Particularly relevant for agents with limited access to formal financial sector
  - Smallholders in rural areas in developing countries
  - Small businesses in the US

- Large theoretical literature (Bardhan, 1980; Bell, 1988)
  - Implicit insurance provided by buyers
  - Limited empirical evidence (Casaburi and Reed, 2014; Macchiavello and Morjaria, 2014)
Contract Farming

- Arrangement where buyer provides inputs on credit to farmer
  - Deduction from harvest payment (including interest)

- Focus on formal schemes
  - Large firm purchasing from many small farmers
  - Exclusivity

- A growing phenomenon in developing countries (UNCTAD, 2009)
  - 110 countries; large share of output for some crops/countries
  - Growing importance with development of more sophisticated value chains, supermarkets, foreign companies
Study Setting

- Large sugarcane contract farming in Western Kenya
- Around 100,000 plots
- Good administrative panel data (yields, area, location)

**Production risks:**
- Rain
- Pests
- Company misperformance (Casaburi et al., 2014)
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Double trigger insurance with payout based upon BOTH individual yield and local area yield (Carter et al., 2013)
- Covers half of losses beneath 90% of farmer predicted yield
- Capped at 20% of farmer’s predicted yield
- (more work on insurance design: moral hazard vs. basis risk)

Predicted yields are farmer specific
- Prediction model based on previous yields and other agricultural variables
Area Yield Insurance

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A1: Upfront premium at actuarially fair price
- Mimics standard insurance contracts (i.e. non-interlinked)

A2: Upfront premium at 70% of actuarially fair price

B: Actuarial fair premium deducted from farmer harvest payment
- NPV equivalent: premium includes interest
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Related Literature

- Insured loans (Gine and Yang, 2009; Karlan and Udry, 2011)
  - Does risk affect demand for credit?
  - Insured loans require an ex-ante fee

- Health insurance and microfinance (Banerjee et al., 2014)
  - Very low take-up (issues in insurance implementation)

- Our question: insurance on credit vs. insurance ex-ante
  - Tarozzi and Mahajan (2013) on bednets
Verifying results in larger sample (roughly double sample size)
Benchmarking the results

- **Social Networks** (Cai, deJanvry and Sadoulet, 2014)
  - An additional treated contact raises take-up from 30% to 36% (heavily subsidized insurance)

- **Endorsement from trusted third party** (Cole et. al, 2013)
  - Take-up from 27% to 37%

- **Financial literacy training** (Gaurav et al., 2011)
  - Take-up from 8% to 16%
Potential Explanations

**Intertemporal Preferences**
- Impatience rates higher than company interest rates

**Liquidity Constraints**
- "I don’t have cash" as most common answer for not subscribing

**Trust**
- Delayed payment reduces concerns insurance company may be a scam or may default

**Reference Point**
- Future payment as “lower gain" as opposed to “loss”
  - Koszegi and Rabin (2007)
The Role of Liquidity Constraints

- Additional pilot: cash drop worth the insurance cost
  - Similar to Cole et al. (2013)

- Treatments
  - Ex-ante premium (A1)
  - Ex-ante premium (A1) + cash drop
  - Premium through deduction (B)
  - Premium through deduction (B) + cash drop

- Caveats:
  - Reciprocity
  - Wealth Effects
Interpretation: credit constraints *not that* important or *very* important.

Bottom-line: a large cash drop does not match deferred payment.
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Bottom-line: a large cash drop does not match deferred payment
1. The potential of interlinking product and insurance markets

- Preliminary results seem to go a long way in explaining insurance take-up
- Arrangements feasible in contract farming settings, whose relevance is growing
- Administrative costs can be low since companies already collect yield data
- If insurance leads to extra investment and buyers get a share of the extra profits, then buyer does not need to make profits on the insurance.
2. **Premium payment through harvest deduction: is it feasible in other settings?**

- Insurance offered through groups, cooperatives (Dercon et al., 2014; deJanvry, McIntosh, and Sadoulet, 2013)
  - Joint liability

- **Dynamic contracts where insurance re-offered only if payment**
  - Subsidizing the first step?

- **Collaboration with banks: insurance company access saving accounts**
  - Possibly some form of commitment?
3. Re-insurance

- Farmers less likely to re-insure if no payout in 1st year
  - Karlan et al. (2013)

- A potential solution: commitment to multiple years of coverage
  - Useful if one year of payout in the period is enough to make farmers see benefits

- Commitment unfeasible with standard insurance, but may be feasible in interlinked contracts
  - Opt-out instead of opt-in