Interlinking Insurance and Product Markets

Experimental Evidence from Contract Farming in Kenya

Lorenzo Casaburi - *Stanford SIEPR*
Jack Willis - *Harvard*

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

Agricultural Insurance: The Experience so Far

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)

Why low take-up? (cont'd)

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?**

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?**

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?**

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?**

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

- 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)

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)

- **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

- **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

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: Actu. fair premium deducted from farmer harvest payment

- NPV equivalent: premium includes interest

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: Actu. fair premium deducted from farmer harvest payment

- NPV equivalent: premium includes interest

A1: Upfront premium at actuarially fair price

- Mimics standard insurance contracts (i.e. non-interlinked)

A2: Upfront premium at 70% of actuarially fair price

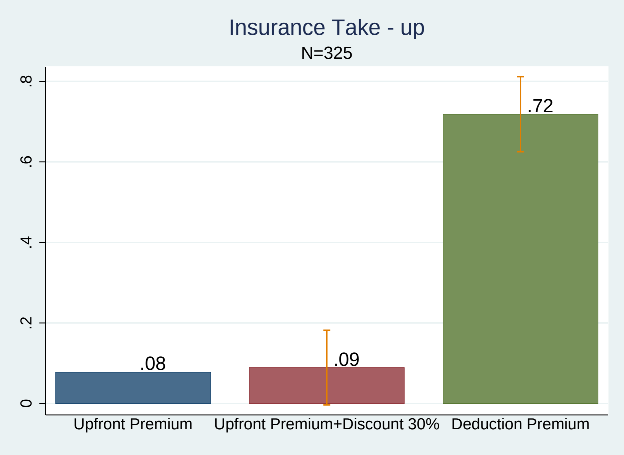
B: Actu. fair premium deducted from farmer harvest payment

- NPV equivalent: premium includes interest

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

Results



- Verifying results in larger sample (roughly double sample size)

- **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%

Intertemporal Preferences

- Impatience rates higher than company interest rates

Liquidity Constraints

- "I don't have cash" as most common answer for not subscribing

Trust

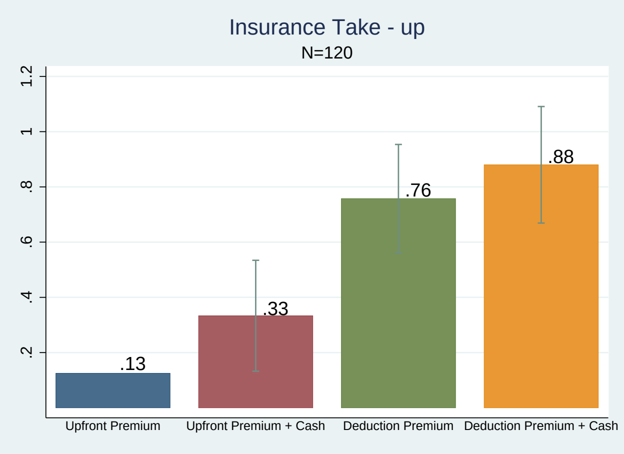
- Delayed payment reduces concerns insurance company may be a scam or may default

Reference Point

- Future payment as “lower gain" as opposed to “loss”
  - Koszegi and Rabin (2007)

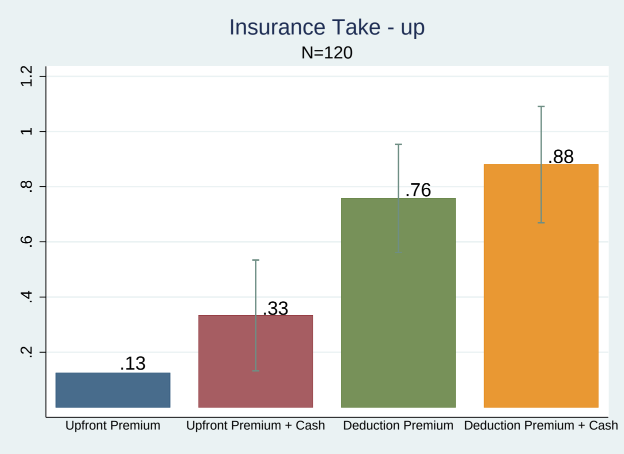
- Additional pilot: cash drop worth the insurance cost
  - Similar to Cole et al. (2013)
- Treatments
  - Ex-ante premium (A1)
  - Ex-ante premium (A1) + cash drop
  - Premium through deduction (B)
  - Premium through deduction (B) + cash drop
- Caveats:
  - Reciprocity
  - Wealth Effects

Results



- Interpretation: credit constraints *not that* important or *very* important
- Bottom-line: a large cash drop does not match deferred payment

Results



- Interpretation: credit constraints *not that* important or *very* important
- 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