

Discussion of “Patterns of Rainfall Participation”

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- Most Important Results
- Additional Ingredients
- Microinsurance as a Business
- Bric-a-Brac
- Conclusion

- Void in academic literature (but see Ag Econ)
- Simple, reasonable model of insurance demand
- Take-up quite low
- Most conditional correlations consistent with model

Most Important Results

- Conditional Correlates of Insurance
 - 1 Basis Risk (-)
 - 2 Wealth (+)
 - 3 Risk Aversion (-)!
 - 4 Familiarity with BASIX (+)
 - 5 “Progressive” / Leaders (+)

Most Important Results

- Some Difficulties with Interpretation
- ① Basis Risk (-)
 - ① Marketed as groundnut / castor product: Can you tease out basis risk there?
 - ② Irrigation (+) ?
- ② Wealth (+)
 - ① Gotta be credit constraints
 - ② But lots of other things
- ③ Risk Aversion (-)!
 - ① “The Theorist, or your own lying eyes”
 - ② “Correct” among certain subsamples
 - ③ [Cole and Topalova find “correct” sign]
- ④ Familiarity with BASIX
 - ① BUA increase by 14 times, BASIX customers by 4 times
 - ② “Huge” –Product very complicated
- ⑤ “Progressive Leaders”

Additional Ingredients: Expected Return

- Pricing formula

$$125 = (E[r] + .25\sigma_r + .01(\max(p))) (1 + .25) (1 + .102)$$

- We know price for Mahbubnagar: 125
- σ_d of payout from Monte Carlo using log-normal fitted distributions: around Rs. 230. Too high, call it 100.
- $\text{Max}(p) = 1500 + 2000 + 2500 = 6000$

Additional Ingredients: Expected Return

$$125 = (E[r] + .25\sigma_r + .01(\max(p))) (1 + .25) (1 + .102)$$

$$\begin{aligned} 125 &= (E[r] + .25 * 100 + .01 * 6000) (1 + .25) (1 + .102) \\ E[r] &= 5.7 \end{aligned}$$

Set $\sigma_r = 0$, premium to 200

$$\begin{aligned} 200 &= (E[r] + .01 * 6000) (1 + .25) (1 + .102) \\ r &= 85 \end{aligned}$$

Expected return: -57% (ignoring time value of money)

Probably somewhere between -95% and -57%

US Insurance: ca. -33%?

- The Right Time
 - Implemented in area after consecutive droughts
 - Previous Year's Policy (2003) paid out

Additional Ingredients: Context

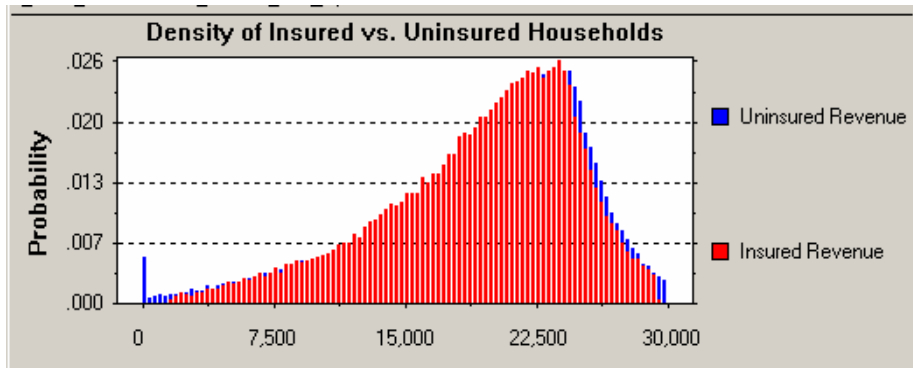
- Household I/S and B/S
 - 9 acres on average
 - ca. 3,000 Rs/acre expected yield => Expected Yield Rs. 27,000
- Purchased 1 policy with expected payout | drought = Rs. 3,000
- Interesting to see how this will evolve
- How does cost of insurance compare with cost of other inputs that may affect production?

Additional Ingredients: Consumer's Problem

- Model a “typical” farmer’s problem
- Household with 3 acres in Mahboobnagar, purchases 5 units at Rs. 125 / unit
- Assume log-normal distribution of rainfall (caveat: bad assumption)
- “Ky” Factors map rainfall deficit into crop shortfall
- Assumption on idiosyncratic shock (0% to 30%, triangle distribution)
- Modest effect of aggregate yield on prices
- Compare household revenue with insurance to revenue without insurance

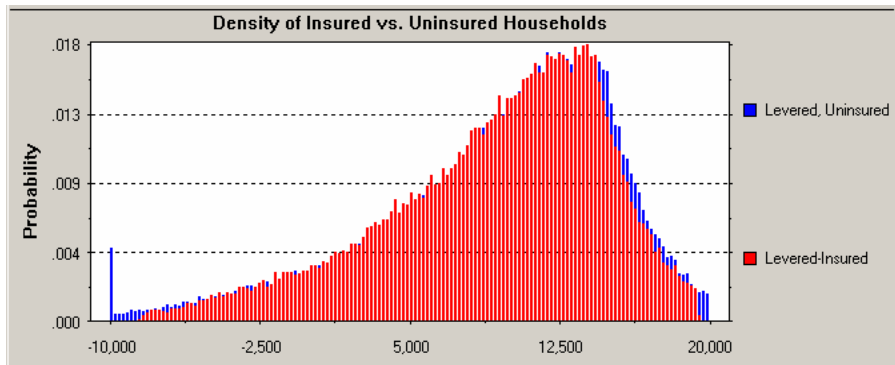
Additional Ingredients: Consumer's Problem

- (Limited) Protection on Downside:



Additional Ingredients: Consumer's Problem

- Consider Operating Leverage: Rs. 10,000 in fixed costs (fertilizer, seeds, etc.)
- Picture less compelling



Insurance as a Business

“Running the Numbers”

Policy	Insurance	Loan
Number of Staff Hours Required to sell one policy		2 6
Price of a Policy / Average Loan Size	600	8800
"Effective" loan size (if declining balance on average loan will be)		4400
Commission for Insurance, Spread for Loan	12.50%	5%
Operating income from product	75	220
Revenue / Staff Hour Committed	37.5	37.7

- Explosive Growth in India and Around the World
- But Many Factors Temper Optimism
 - Clients, MFIs may be unable to evaluate policies
 - Rainfall station must be nearby [but satellite technology]
 - Limited experience with insurance “If I buy insurance and the policy does not pay out, can I get a refund at the end of the year because the policy was unused”
- Rainfall insurance and capital markets
 - Two major players in India right now
 - Model Risk [Global warming, el Nino, etc.]
 - $\beta \cong 0$
 - Buyers / MFIs do not have ability to evaluate products

- Temporal Adverse Selection
- Why include 'control' villages
- Intensive Margin?
- Match Date Policy Sold to Daily Rainfall / Temperature Data?
- More connection to existing literature?

- Solid Beginning to Answering Tremendously Important Questions
- Exciting Randomized Intervention on Horizon