



Risk Management and Investment Decisions

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May 29, 2018

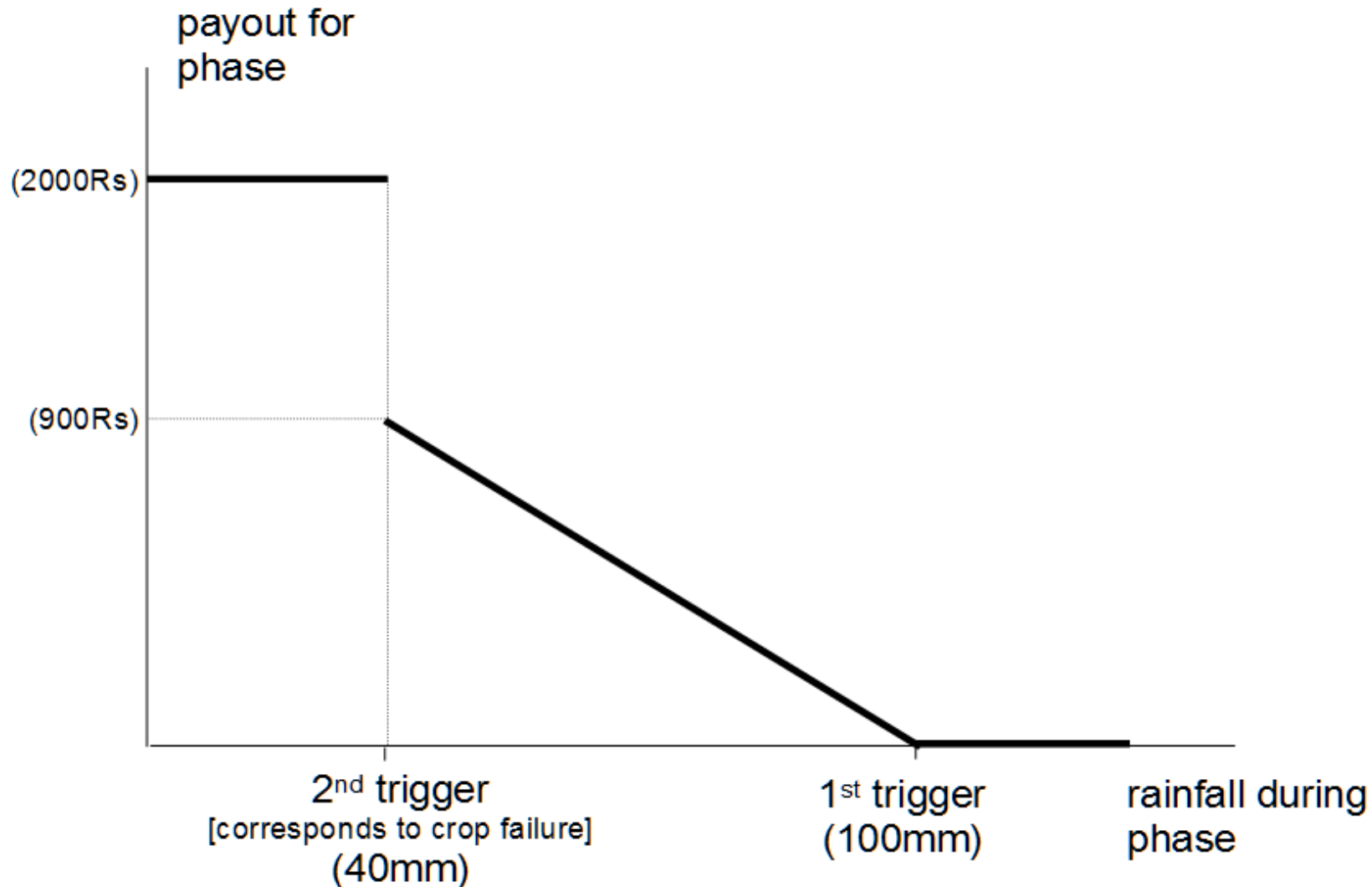


Overview of Presentation

- 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

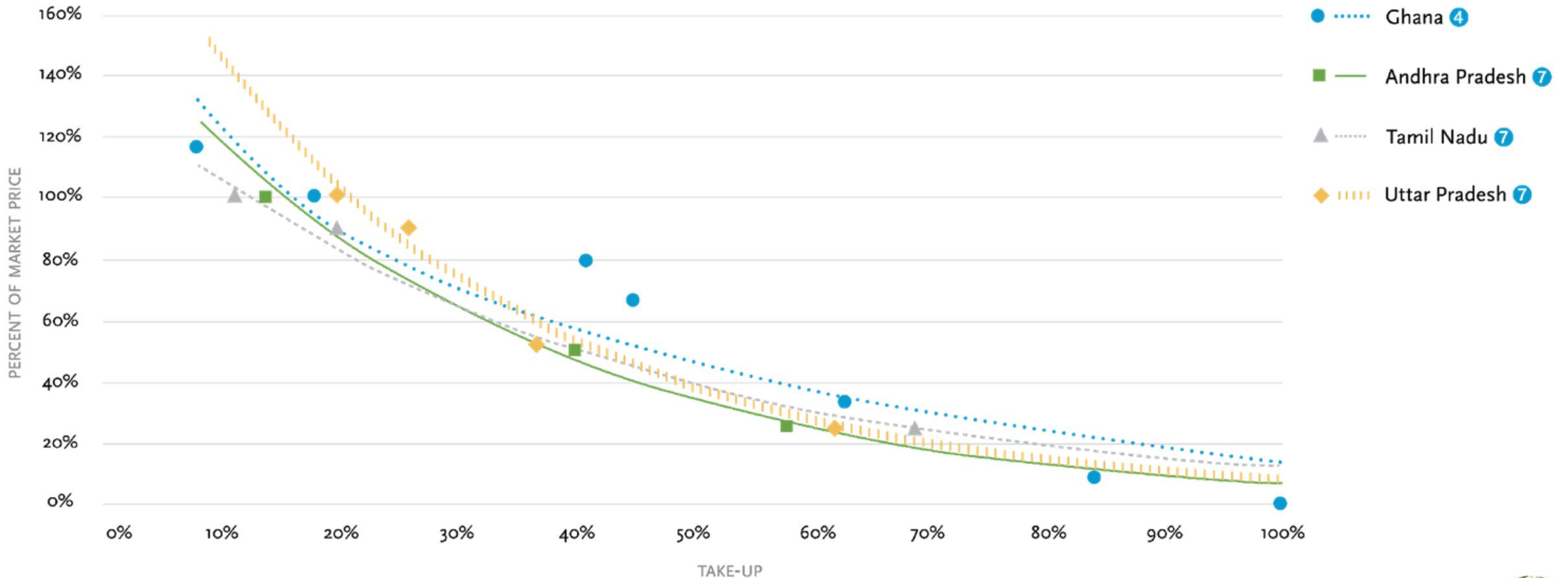
Cons:

- 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)



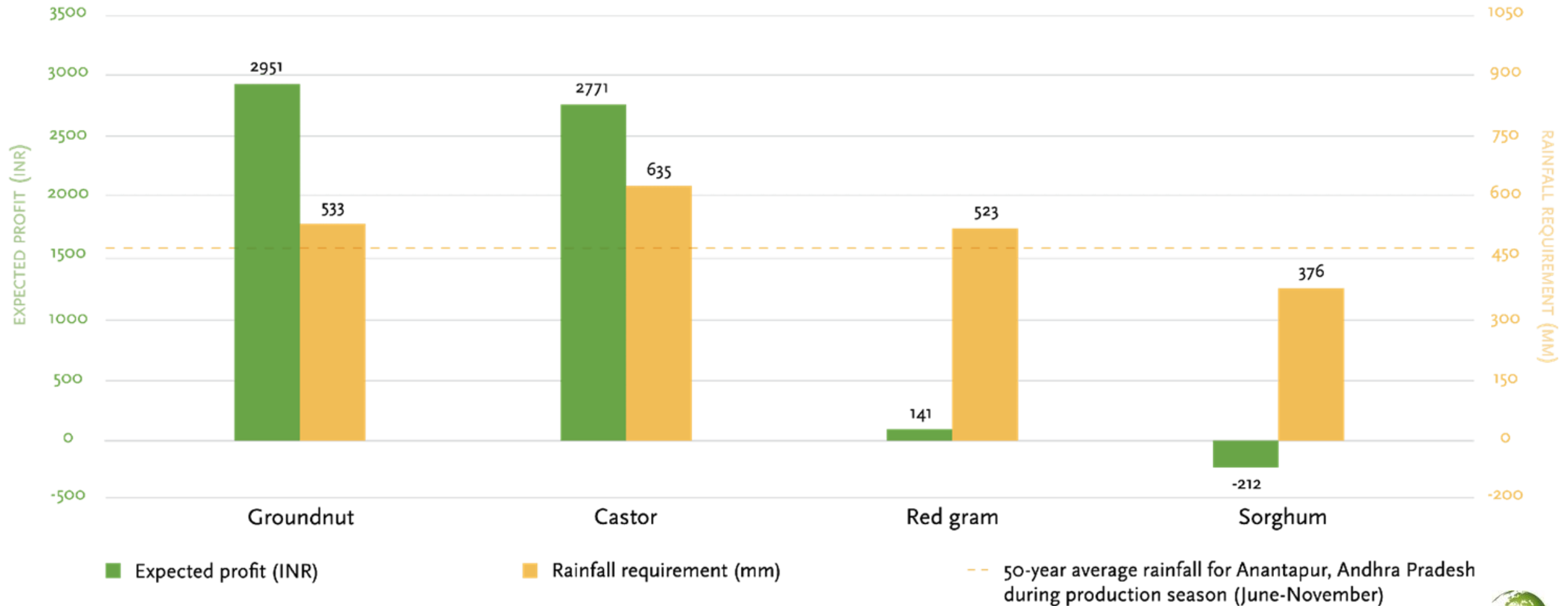
Challenges with Take-Up

- 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

EXPECTED PROFIT AND RAINFALL REQUIREMENTS IN ANDHRA PRADESH



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 to 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

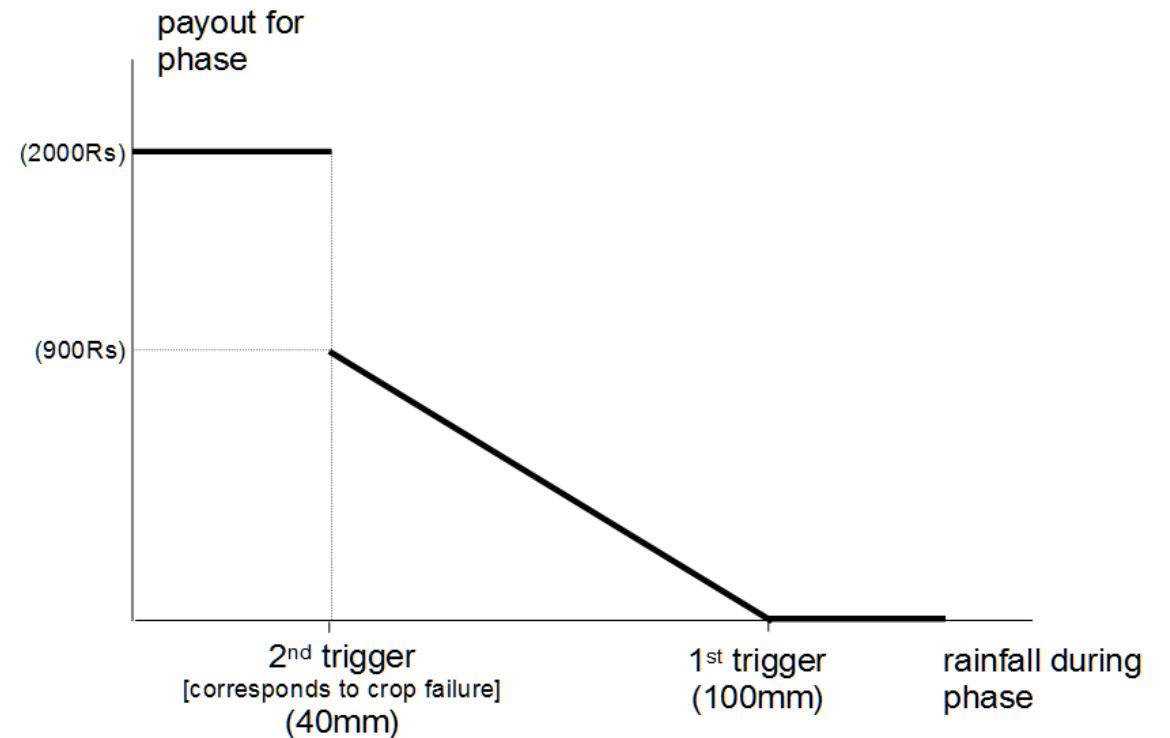
- Cole, Gine, and Vickery (2018)
- Evaluate willingness to pay of 2,000 farmers for four different policies

(1) Actual Policy

(2) Lower payment per mm deficit

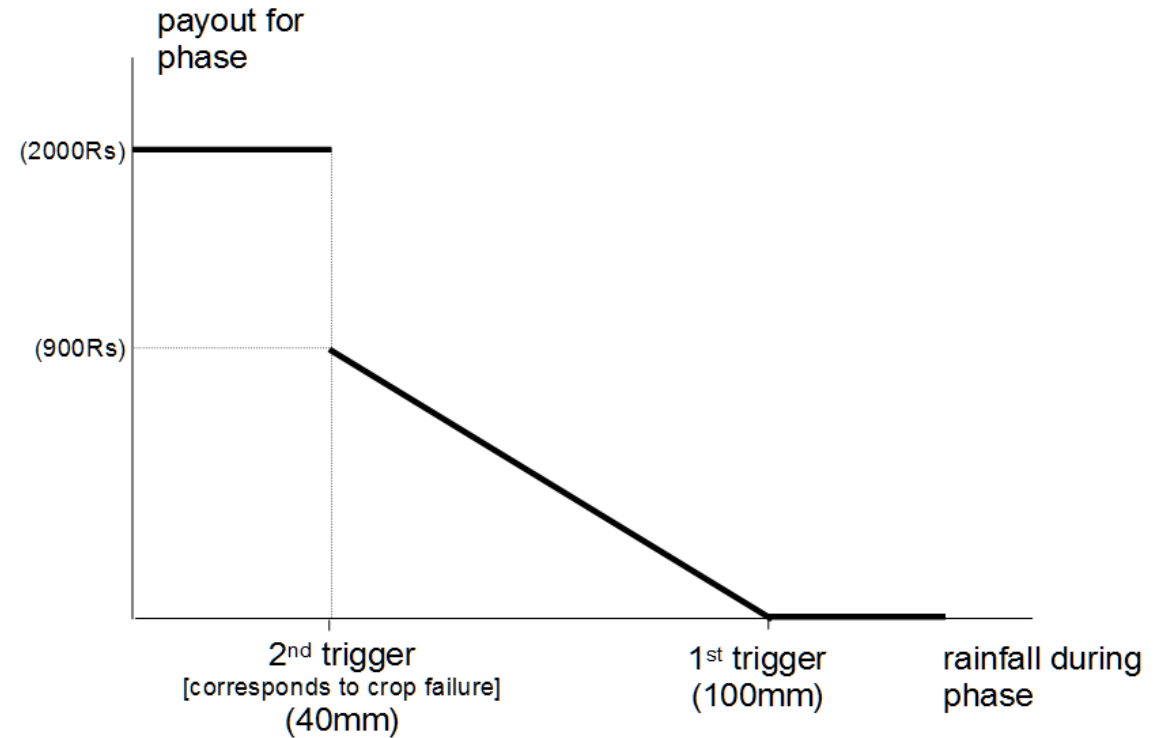
(3) Exit payout more likely

(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

