Assessment of the Burkina Faso project using methodology 1: the Safe Minimum Standards (SMS) methodology

Thomas Barré, Michael Carter & Quentin Stoeffler

University of California, Davis

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VALUE FOR FARMERS FROM INSURANCE PRODUCTS

- Value of insurance from farmers' perspective: better-off with or without insurance?
- Relates to issue of **basis risk**: probability of having a shock but no insurance payments; other important factors include price and idiosyncratic risk
- Case of Burkina Faso: group insurance cotton for farmers
- SMS methodology: important part of product's quality; PACE = adds several "implementation" dimensions

QUESTION

1. How can we compare different insurance products?
2. Is it possible to set "Safe Minimum Standards" (SMS) requirements?

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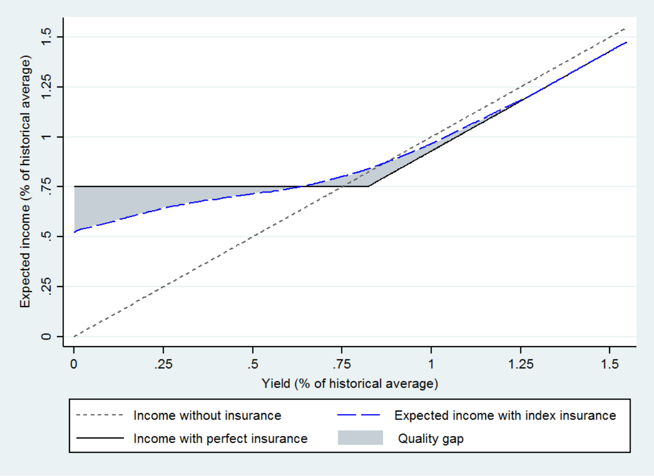
OUR TARGET

- Goal = protecting current consumption and assets despite production shocks
- Means = stabilizing production income at a certain level (e.g. 75% historical average)
- Implications $\rightarrow$ an insurance with value for farmers:
  - A Insurs large share of income (e.g. main crop)
  - B Covers shocks that matter (or all shocks)
  - C Pays when losses

An income stabilization target



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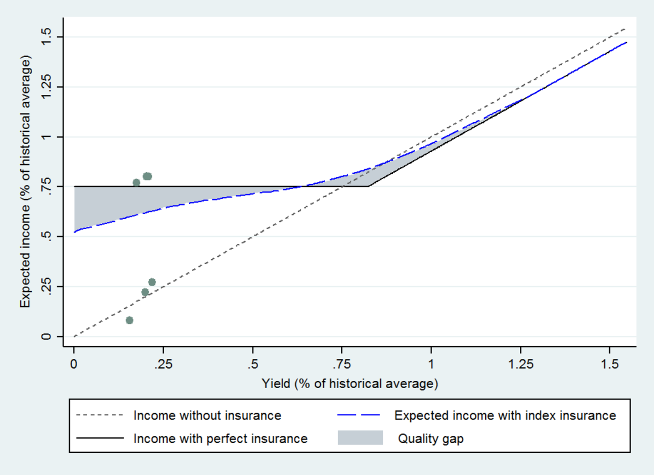
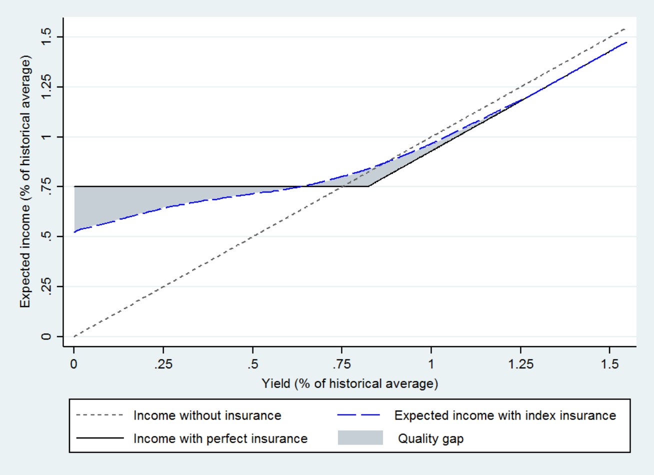


Determinants of insurance quality

Assuming an “appropriate” product, lack of quality stems from:

1. Idiosyncratic risk
   - Pure idiosyncratic risk (e.g. elephants)
   - Heterogeneous impact of shocks
2. Geographic scale of the index (e.g. distance to weather stations)
3. Index prediction errors (e.g. satellite $\rightarrow$ yields)
4. Price!

An income stabilization target



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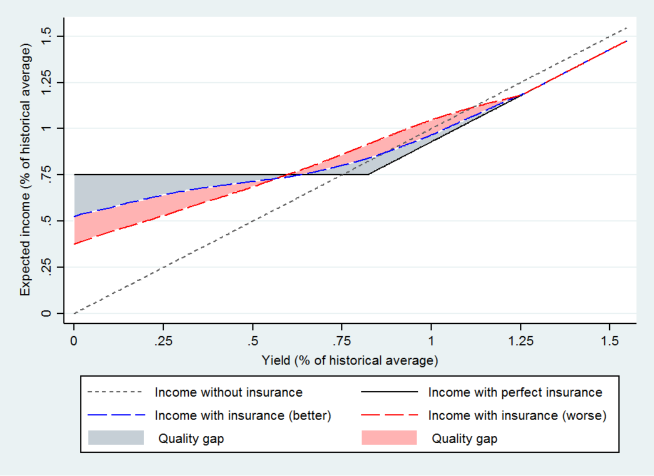


A Safe Minimum Standard

- The *reservation price* for an insurance contract is the maximum price that an individual could pay for the contract without making herself worse off
- Formally, the reservation price is the amount of money ρ that equalizes the insured's expected well being with and without insurance:

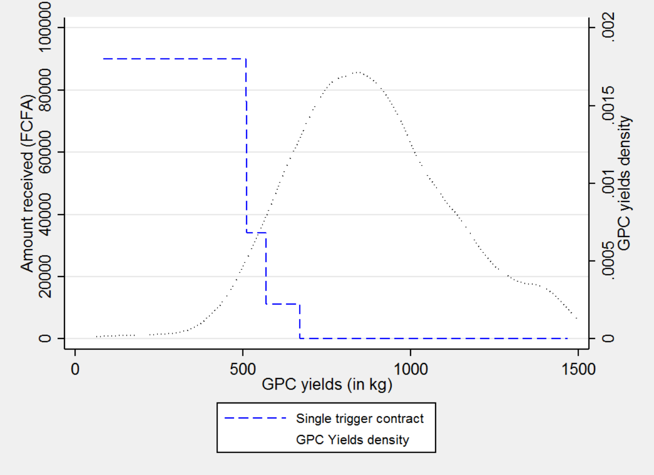
$$0.8 \int u(y+I-\rho)\phi(y)dy + 0.2 \int u(y-\rho)\phi(y)dy = \int u(y)\phi(y)dy$$

- The *Safe Minimum Standard* is that this reservation price is no less than the market price
- Note that other things (e.g., pay repayment performance) can make a contract worse less than the reservation price, so this is a *minimum* standard

Applying the SMS Measurement to Burkina Cotton Contract

- Area-yield cotton insurance offered to farmers joint-liability groups (GPCs)
- Insurance provided on credit by the public cotton company, Sofitex (provides input and local monopoly)
- Double trigger insurance:
  1. GPC level threshold
  2. “Neighborhood” (to limit moral hazard; higher threshold)
- Major risks are drought, flood, pest, etc. Rainfed agriculture, costly coping mechanisms ex-ante & ex-post.

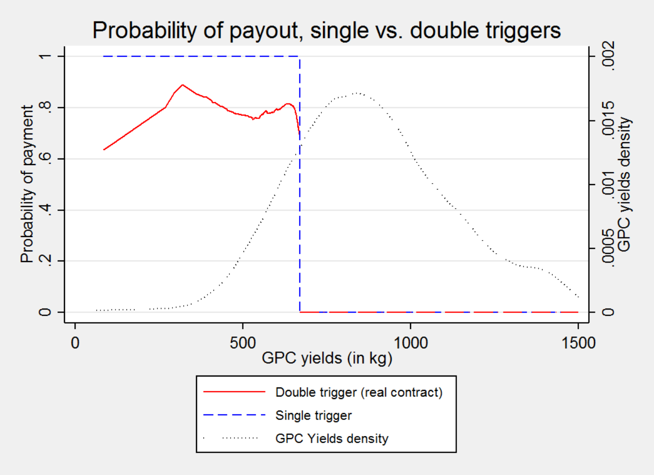
Contract Structure



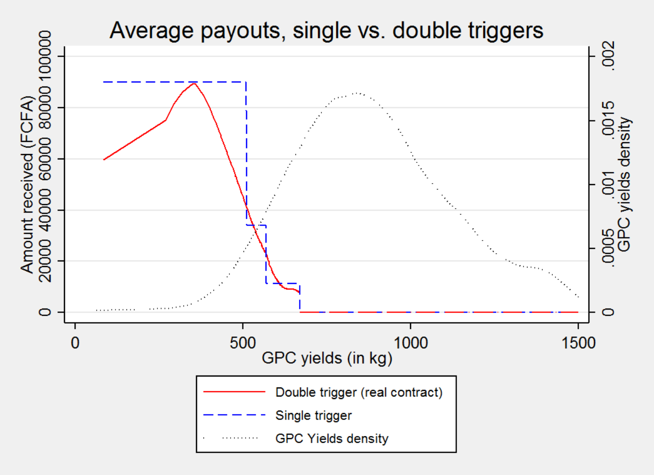
Data

- Yield data for each GPC in Hounde and Dedougou from 2000 to 2014 from Sofitex (actual, weighted production)
- Estimations of distribution of yields (4 categories of GPCs)
- Focus on Hounde & second category here
- Individual data for 80 GPCs (1,000 households) from 2008 to 2014: mostly retrospective data collected by our research team

Probability of payment



Average payouts received



Reservation price methodology

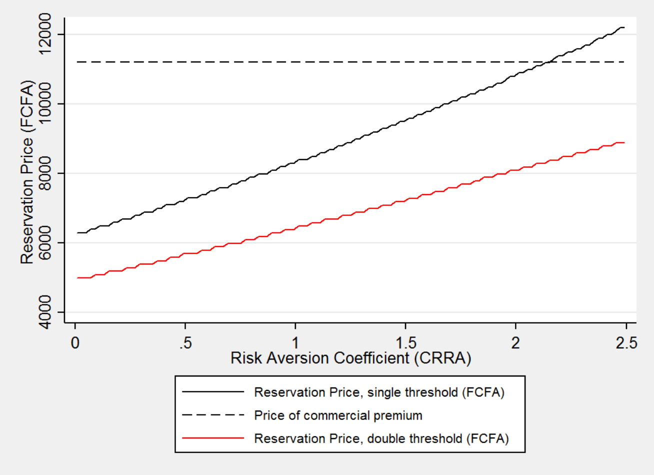
- We can visually seem some of the weaknesses of the existing contract compared to the single trigger village area yield contract
- To judge the value of these contracts, let's now calculate their reservation prices as defined above
- We will initially assume that the village cotton cooperative (joint liability borrowing group) is the insured party
- This assumption may value the insurance more than if we assumed that all liability was at the level of the individual cooperative member
- Neither assumption is quite right

Reservation price methodology

- Results will also depend critically on how much more we value money when yields are low than when they are high
- This valuation is captured by the parameter α in the following specification of the valuation or utility function

$$u(y) = \frac{y^{(1-\alpha)}}{1-\alpha}$$

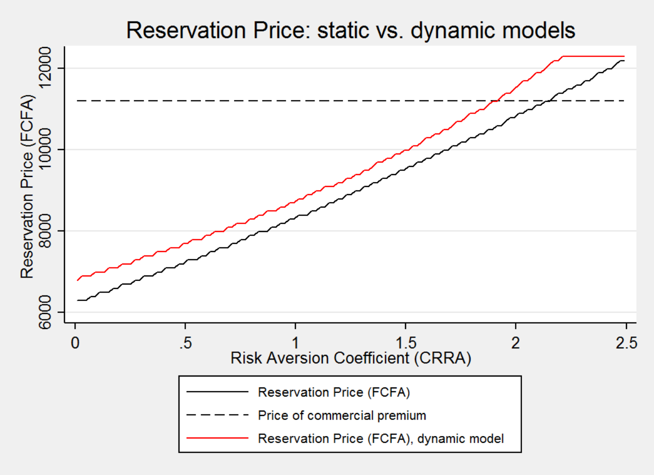
RP: Single vs. double trigger



Are We Understating Reservation Price?

- Current valuation does not consider long-term benefits of insurance (ability to maintain creditworthiness and stay in business)
- It may also be the three payment levels of the contract (as opposed to a payment schedule where payments increase in lock step with losses) causes a low valuation of the reservation price
- In fact, the second factor does not (much) matter, but the first does
- Let's examine this added source of value assuming that insurance reduces from four to zero percent the chance that default occurs

Static vs. dynamic contracts



Reservation Price for the Individual

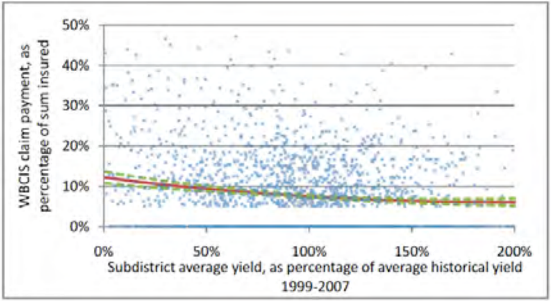
- GPC analysis important because of the probability of group default
- But individual level matters as well
- Data: shorter panel, recall...
- Various additional factors:
  1. Payouts not as well correlated with shocks
  2. More extreme events $\rightarrow$ insurance matters more

Conclusion

- Quality matters $\rightarrow$ "SMS" methodology to assess value for farmers
- Illustration with area yield contract in Burkina Faso
- Low failure rates by design...
- ... but **price** clearly an issue here
- Need more analysis on individual level quality

Unfortunately Index Insurance Can Fail the Farmer

- Disappointed (angry) farmers & what are sometimes called "Basis Risk Events" have punctuated the importance of designing contracts that protect farmers
- The problem is far from trivial as the following analysis of the relationship between average losses and indemnity payments under rainfall insurance in India shows:



Conclusion: Quality Standards & Their Importance

- Work here suggests a safe minimum quality standard:
  - Reservation Price > Market Price
  - Note that even if insurance is subsidized, beneficiaries would be better if simply given the subsidy rather than given cheap insurance that approximates a lottery ticket
- Issues of quality assurance are very important:
  - Clarke & Wren-Lewis (2014) make a very compelling argument that without quality certification standards, markets will reach an equilibrium in which low quality contracts predominate
- Much to learn about how to implement those standards, but also how to design contracts that meet those standards
- Hope that the novel contract designs we have shared today stimulate some ideas!

Thank you for your attention!

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