Index-based Weather Insurance – Exploring Demand and Take-up

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Unpredictable rainfall is a dominant sources of weather-related production risks in agrarian regions, especially in semi-arid areas where cultivation is primarily rain-fed (Skoufias et al., 2010; Dercon et al., 2005). Indeed, Parchure (2002) estimated that in India about 90% of variation in crop production levels is caused by variation in rainfall levels and patterns[1].

Recent innovations in the agricultural insurance market have led to the creation of index-based weather insurance, a product in which an exogenous publicly observable parameter, for example rainfall, is used to determine insurance payouts for a defined geographic area. The product provides inherent benefits such as reducing moral hazard and adverse selection and provides efficiency gains by eliminating the need for in-field assessments. However, existing evidence indicates that take-up rates for index insurance products is extremely low even when actuarially-fair rainfall insurance contracts are offered (Cole *et al.*, 2009).In brief, this research study seeks to understanding the existing low market demand for index-based rainfall insurance through a randomized experiment in an environment where informal risk-sharing networks exist.

This document provides insight on the demand constraints and market potential for index-based rainfall insurance in rural agricultural communities. The document should prove useful for policy makers and industry practitioners who are interested in understanding both the current demand and supply challenges for take-up of index-based weather insurance.

Policy Implications:

- High demand for weather-based insurance amongst the agricultural collie (labour) population:
  A novel point of this study was offering our rainfall insurance product to agricultural labourers. As the income for these households is as dependent on weather patterns as for cultivator households these individuals should also exhibit demand for the product; our research allowed us to observe this demand. We found that cultivator households purchased, on average, 2.5 times more units of insurance than labourer households, the demand for the product was actually equal (as a percentage of households within each sample) amongst cultivator and labourer households.

- Impact of basis risk on insurance take-up:
  Basis risk, or the potential for discrepancies in measurements taken at a reference weather station, and the realized weather parameter (for example, rainfall), taken at a farmers plot is one of the major risks of an index-based weather insurance product. Due

[1] In a household survey conducted in Andhra Pradesh, 89% of surveyed rural landowners cite drought as the most important single risk they face (Gine et al. 2008).

to discrepancies in these measurements, the purchaser may not insure against his *real* losses. This problem is magnified in India where the number of existing rainfall stations used to calculate payments and payouts is limited. The common coverage area for an index-based insurance contract is at the Block level, a reasonable coverage area, but micro-climates exist and farmers consistently prove doubtful of index-based insurance. In our study we examine the effects of basis risk on purchasing decisions and find that introducing basis risk creates a complementary between informal risk sharing and the gains from index insurance: communities that are better able to insure individual losses may have a greater demand for index insurance. It demonstrates that in the absence of basis risk, farmers choose full-coverage, actuarially-fair index insurance, independent of the community's ability to informally insure against idiosyncratic losses.

- The impact of marketing delivery on the take-up of insurance:
  In our study we varied several components of our 'marketing script' in order to evaluate if how a product is marketed significantly impacts purchasing decisions. We find that across our sample, using a marketing script where the index-insurance is referred to as a financial product as opposed to an insurance product, produces a positive effect on take-up by 3 percentage points, significant at the 10% level, as opposed to using a regular or "normal" marketing treatment where the product is simply referred to as insurance. This seems to consumer trust or comfort with the idea of insurance. Perhaps with increased interaction and trust building between rural customers, particularly low-income agricultural households, and insurance companies this demand biased can be reduced.

Dissemination:

The academic paper "Selling Formal Insurance to the Informally Insured" and the policy paper "Some Policy Lessons from Marketing Monsoon Onset Insurance in Tamil Nadu, Uttar Pradesh and Andhra Pradesh, India" should be circulated amongst professional researchers, policy makers and practitioners involved in the agricultural insurance industry and the micro-insurance industry. Organizations or individuals who operate in the Indian market would be particularly interested in these papers as they provide much contextual evidence on the current Indian market. Organizations such as the Agricultural Insurance Company of India, ltd, Basix, World Bank and GIZ would find the documents informative.

Further Readings:

Two additional readings that significantly add to the discussion of rainfall insurance markets in India are Xavier, G., et al., "Pattersn of Rainfall Insurance Particiation in Rural India" (2008) and Cole, S., et al., "Barriers to Household Risk Management: Evidence from India" (2010). Both papers further the discussion on demand constraints and potential impacts of index-based weather insurance.