

Proposal for the Russell Ackoff Doctoral Student Fellowship
for Research on Human Decision Processes and Risk Management

***Estimating Structural Models of Insurance Demand
Using Data from a Randomized Field Experiment in Gujarat, India***

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Note: In lieu of signature, Jeremy Tobacman has been copied on my electronic grant submission.

Estimating Structural Models of Insurance Demand Using Data from a Randomized Field Experiment in Gujarat, India

The demand for insurance in rural economies is complex and not well understood. Rural households face a number of significant risks, one of the most important being crop failure from drought or excessive rain. When these events occur, common coping mechanisms such as informal insurance, credit or increased labor supply are not effective because the shock adversely affects all households in a given region. In theory, these households can obtain insurance for weather-related shocks by accessing larger financial markets. A structural model of insurance demand can help predict the impact of creating and distributing microinsurance products.

There are four main questions that I seek to answer, and that can be answered most effectively with a structural model. First, how much index-based rainfall insurance should Gujarati farmers buy? Insurance demand is clearly sensitive to price and household risk aversion (Cole et al 2009; Giné et al 2008.) Structural estimates for price elasticities of demand can help determine the optimal levels of rainfall insurance given household preferences.

Second, how does financial literacy affect decision-making about rainfall insurance purchases? A significant barrier to the success of rainfall insurance appears to be low levels of financial literacy among the rural poor (Cole et al 2009.) In the data, financial literacy is measured using four questions developed by Lusardi and Mitchell (2006) on interest, inflation and risk diversification. An additional question measures knowledge of insurance. The extent to which financial literacy explains insurance purchases is important and to the best of my knowledge, nobody has explored its role using a structural model before.

Third, suppose that one could write enforceable contracts that would require rainfall insurance premiums to be paid at harvest time, i.e., at the same time that the insurance would pay claims. What would be the effect on demand? Farmers may prefer to pay premiums at harvest

time because they are less liquidity constrained at that time. From the data, I can calculate the factor by which farmers discount their incomes when offered this option. Estimating demand effects by accounting for the intertemporal choice problem faced by rural households can have enormous implications for the design of microinsurance products.

Fourth and finally, what is the relationship between estimates of risk aversion parameters obtained from standard Binswanger lotteries and from field observations of consumption, insurance purchase, and informal insurance transfers? Estimating risk aversion from field observations is a computationally demanding exercise compared to lotteries or lab experiments, which are relatively easy to carry out. Comparing the two estimates would be an important contribution to empirical research methodologies in behavioral finance.

I currently have access to a five-year panel dataset containing household survey responses from 100 villages in Gujarat. About 15 households are sampled in each village and the information collected includes demographic variables, consumption and income patterns, agricultural practices and access to financial services. The treatments allow me to observe variation in product pricing and product structure (e.g. premiums paid before/ after harvest.) Experimentally obtained data such as the cognitive ability of household heads are also included.

The sixth round (Wave 6) of the Gujarat survey will take place in winter 2010. With this fellowship, I plan to go to India and supervise data collection on behalf of the research team. I also anticipate collecting new data (e.g. farmers' beliefs about rainfall, different methods for eliciting risk preferences) to test hypotheses raised by the structural analysis. As mentioned in the budget, currently my only source of funding for this research is the departmental doctoral stipend. The project's other expenses are funded by the USAID BASIS Assets and Market Access Collaborative Research Support Program.

References

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