Risk and Insurance

Empirical Exercise

We replicated Table (5) of:

> Cole, S., Giné, X., Tobacman, J., Topalova, P., Twonsend, R., and Vickery, J. (2013). **Barriers to Household Risk Management: Evidence from India.** *American Economic Journal: Applied Eocnomics*, 5 (1): 104-135. DOI: 10.1257/app.5.1.104.

Table (5) includes the paper's baseline results on Andhra Pradesh where four treatments were implemented:

1. An insurance educator visited the household.
2. This insurance educator was endorsed beforehand.
3. The insurance educator brought cash.
4. The insurance educator presented a specific education module.

Question 1

Summarize the main conclusions that can be drawn from the table about (a) each of the treatments' effectiveness, i.e. columns (1) - (3), as well as (b) heterogeneity therein, i.e. columns (4) - (6).

Suggested solution:

The conclusion based on Table (5) with respect to each of the treatments are:

- The visit alone has a robust positive effect on up-take.
- High cash rewards enhance this effect.
- For the other two treatments, the results are weak and not robust throughout specifications.
- There is some evidence for within village spillover effects from endorsement although this analysis could be more evolved.

With respect to the heterogeneity analysis, the treatment indicators are interacted with:

(a) Whether or not the HH is familiar with BASIX (a local insurance provider).

(b) A wealth index stemming from a principal component analysis and imputed for missing observations.

(c) Log per capita food consumption.

The results from these analysis show that endorsement only positively affects up-take if the HH is familiar with BASIX which is a very intuitive result. Additionally, they find that the effect of high cash rewards is larger among poorer HHs.

Question 2

You are provided with a data-set. It includes the variables to replicate Table (5) which you know from the exercise. Additionally, you now also have the qualitative, non-experimental data on households' self-reported explanations for their rainfall insurance purchase in Andhra Pradesh. Why did the authors collect these data? Mention at least three questions left open by the results presented in Table (5), they hope to address with these data.

Suggested solution:

The authors use this data to discuss correlates of insurance uptake. Since it is non-experimental data, the results produced with it are not given a causal interpretation but interpreted cautiously.
As three questions, the students could mention the following:

1. How does the current case behave with respect to predictions from standard insurance demand models? For example, does insurance demand increase with risk aversion, variance of consumption, and the correlation between consumption and insurance payouts?

2. Which skills are most relevant for households to understand and purchase insurances?

3. Do individuals in tightly connected networks demand less insurance? Usually, rainfall cannot be insured informally by, e.g., village pooling as it is a non-idiosyncratic risk.

Question 3

Replicate the results for Andhra Pradesh reported in Table (8) of the paper. Export the results in a nicely formatted table and include this table in your report. Note that you do not need to export the results the same way the authors do. You are also welcome to present them in several tables or to use graphs. The authors estimate effects from a linear probability model. Which other possible strategies are there and why might one consider them preferable?

Suggested solution:

The students should replicate the results in Table (8) and export them in a nicely formatted table (see below). They should mention that a probit or logit model would be an alternative to a linear probability model. They should briefly discuss advantages and disadvantages of these models with respect to the linear probability model.

Question 4

In the present context, the authors argue that trust is highly relevant for insurance uptake. What evidence do you find for this, both in your estimation as well as in Table (5) of the paper?

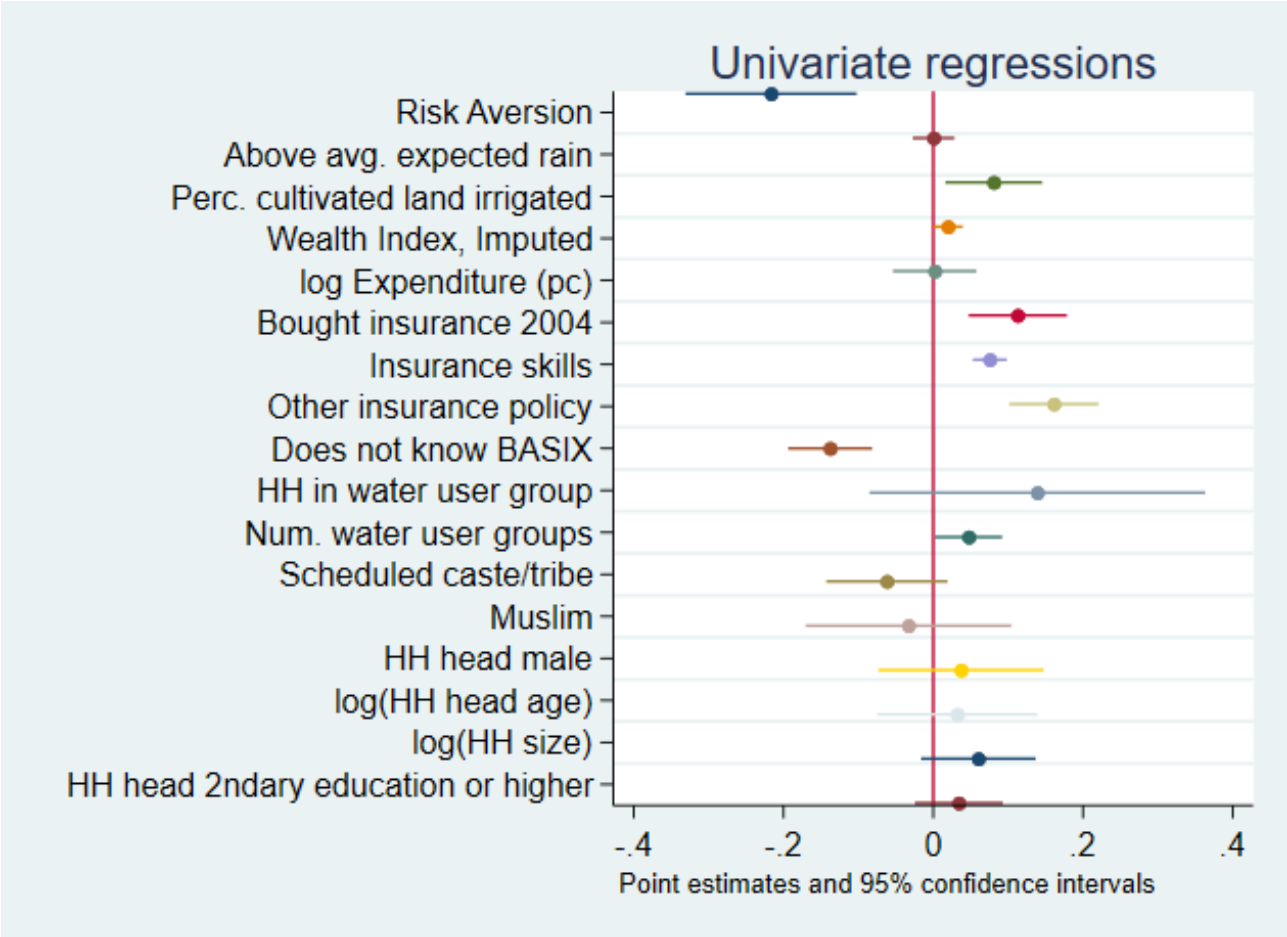

Figure 1: Estimates Column (1) Table (8) in the Paper

Table 1: Table 8: Column (2)-(3), Dependent Variable: Insurance Purchase

	(1) No Village FE		(2) Village FE	
Risk Aversion	-0.142**	(0.059)	-0.102*	(0.059)
Above avg. expected rain	-0.008	(0.014)	-0.007	(0.015)
Perc. cultivated land irrigated	-0.013	(0.036)	-0.013	(0.037)
Wealth Index, Imputed	-0.004	(0.013)	-0.005	(0.013)
log Expenditure (pc)	-0.010	(0.039)	0.019	(0.040)
Bought insurance 2004	0.049	(0.035)	0.077**	(0.037)
Insurance skills	0.047***	(0.014)	0.045***	(0.015)
Other insurance policy	0.125***	(0.032)	0.115***	(0.034)
Does not know BASIX	-0.105***	(0.030)	-0.117***	(0.032)
HH in water user group	0.109	(0.111)	0.049	(0.112)
Num. water user groups	0.035	(0.023)	0.022	(0.024)
Scheduled caste/tribe	-0.004	(0.043)	-0.005	(0.045)
Muslim	-0.030	(0.071)	-0.104	(0.080)
HH head male	0.053	(0.058)	0.037	(0.056)
log(HH head age)	0.085	(0.056)	0.104*	(0.058)
log(HH size)	-0.005	(0.050)	0.022	(0.050)
HH head 2ndary education or higher	0.001	(0.032)	0.007	(0.033)
Avg. insurance payouts 2004-5	0.073*	(0.042)		
Constant	-0.077	(0.367)	-0.347	(0.372)
Observations	1047		1047	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Suggested solution:

They should discuss the estimated effects of the variables measuring familiarity with insurance and BASIX and argue how, in general, knowledge and (positive) experience can generate trust.

Question 5

You can infer from your estimation that risk aversion negatively affects insurance uptake. This is counter-intuitive. What reasons might there be for this finding? What role could trust play? Provide and discuss some evidence based on the data you have.

Suggested solution:

Students should cite the paper arguing why insurance is, in fact, considered a risky product. Moreover, they should mention that the theoretical relationship between insurance uptake and risk aversion is ambigious in the presence of basis risk[1].

They then are expected to find their own way to partition households based on how much trust they supposedly have into insurance products/ BASIX. This can be done based on household's past and current experiences with insurance products. They should then move on to assess whether trust or lack thereof is a driver of the negative relationship between risk aversion and insurance uptake.

As a suggestions, they could compute the row average of the variables indicating whether they bought an insurance before, know BASIX, or have another insurance policy and use that to define whether or not a household should have high or low trust in/knowledge of insurance policies. This measure of trust is negatively correlated with the measure of risk aversion. They could then either split the sample or use the interactions to assess whether the relationship between risk aversion and insurance uptake changes. Output from both is inserted below. There is some evidence, albeit not strong, that trust or knowledge improve the negative association between risk aversion and insurance uptake.

Table 2: Same specification, interactions with trust level indicator

	(1) ins_lev	
riskav1_jul06	-0.156*	(0.087)
high_trust=1	-0.054	(0.074)
high_trust=1 × riskav1_jul06	0.081	(0.117)
Observations	941	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[1] Clarke, Daniel. 2011. "A Theory of Rational Demand for Index Insurance." University of Oxford Department of Economics Discussion Paper 572.

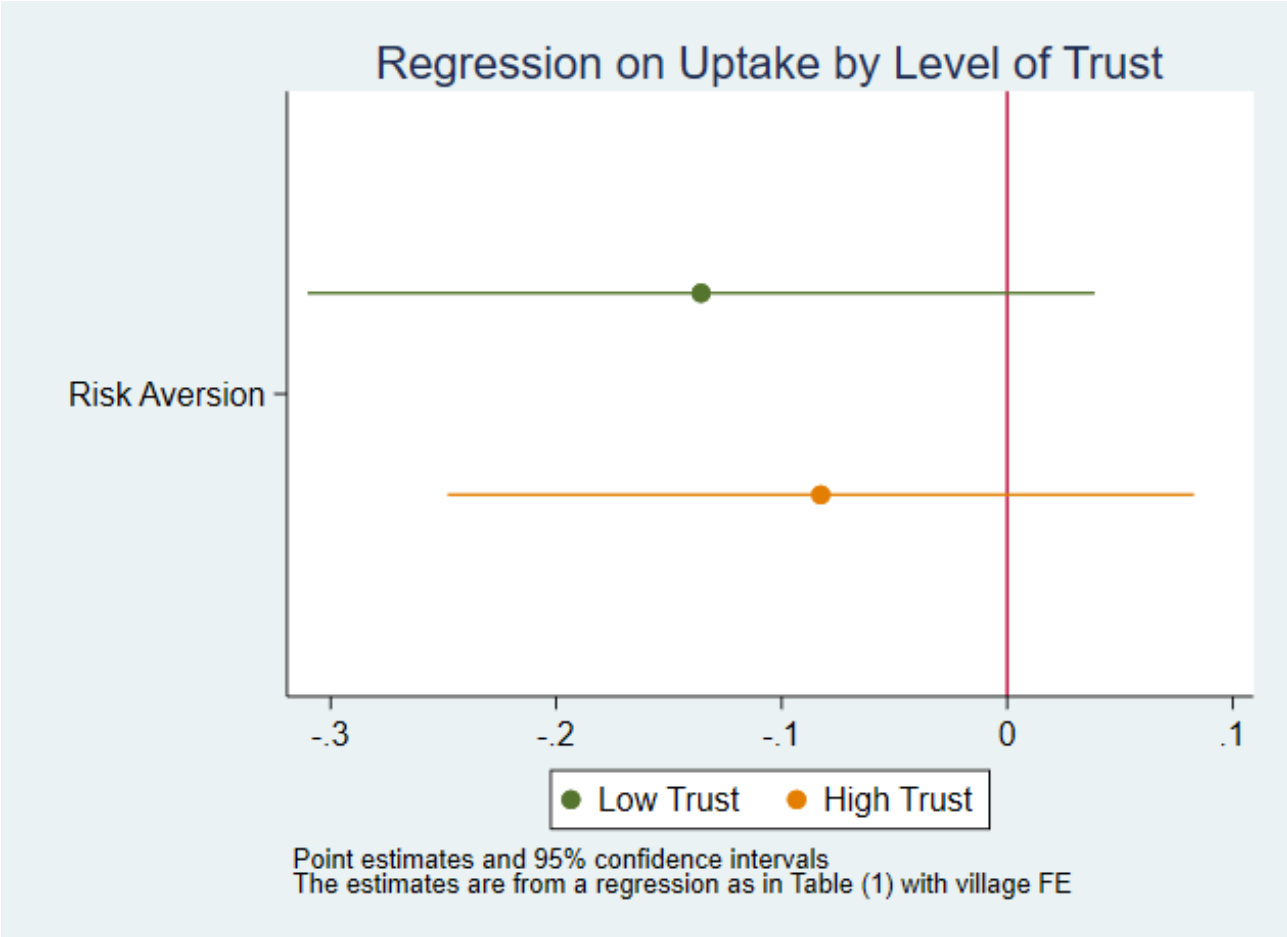

Figure 2: Estimates Column (1) Table (8) in the Paper