Evidence of Demand for Index Insurance: Experimental Games and Commercial Transactions in Ethiopia

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Climate change adaptation

Climate change: more bad years

Adaptation: increase productivity in normal years to cover bad year loss

But strategies that increase productivity in most years face increased risk in bad years

Threat of 1 drought year out of 5 prevents other 4 from being much more productive

Key to adaptation is to relax risk of bad year to unlock productivity options

Why index insurance?

Insurance: reduce risk to unlock productivity

But problems with traditional insurance have made it tough to implement

Recent index innovation Insure weather index

- eg: provide payout if there is drought
- Cheap, “easy” to implement, good incentives
- Many limitations

Still in early years

IRI experience and perspective

International Research Institute for Climate and Society

- Enhance societies ability to understand and manage climate risk

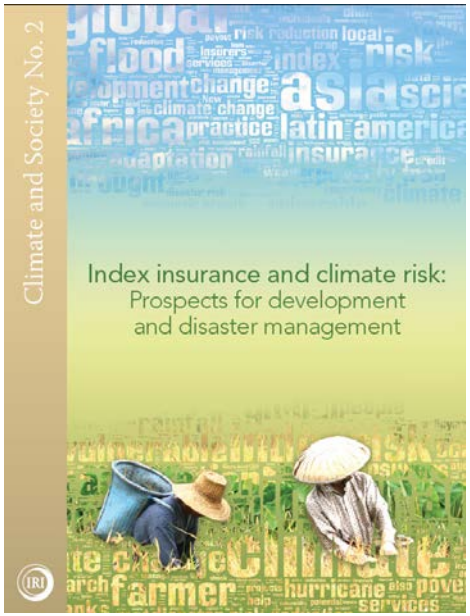
IRI worked since ‘early days’ of index insurance

- Solid science base, working with farmers, processes, capacity building and training, informing policy

Projects:

- Ethiopia, Ghana, Honduras, Indonesia, Kenya, Malawi, Mali, Nicaragua, Nigeria, Philippines, Rwanda, Senegal, Tanzania, Uganda, Uruguay, Argentina…
- Purchased by tens of thousands of farmers

- Highly demanded, quickly scaling
- Significant impacts



Many necessary risk management pieces

Risk reducing investments for all years

Reinsurance and International resources

Catastrophe leading to large scale hunger

Early season drought–Insurance

Late season drought–Insurance

The rest: savings, community risk sharing

Insurance strengthen an Adaptation project

Horn of Africa Risk Transfer for Adaptation (HARITA)

- Risk Reduction, Risk taking, Risk Transfer, Risk Reserves (R4)
- Farmer driven design
- “Unreachable” (low income, data-poor)
- Satellite payouts
- Labor or cash to purchase insurance

Partners: Oxfam America (PSD, HARO, HRD), SwissRe, IRI, REST, DECSI, NYALA, Ethiopia Met Service, Rockefeller, crop parameters from LEAP, Mekele University, builds on groundwork by and software with WB CRMG, WFP

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Growth of the HARITA project

Year	2009	2010	2011
Covered Villages	1	5	43
Insured HHs	200	1,308	13,044
Male	125	802	8,740
Female	75	505	4,304
Total Insured	$6,765	$57,318	$934,337
Premium	$1,624	$21,001	$213,743

Key questions to answer

Do farmers want insurance?

Do farmers want to pay more money for more insurance?

- More frequent?
- Higher payouts?

How does insurance interact with

- Savings?
- Money right now?

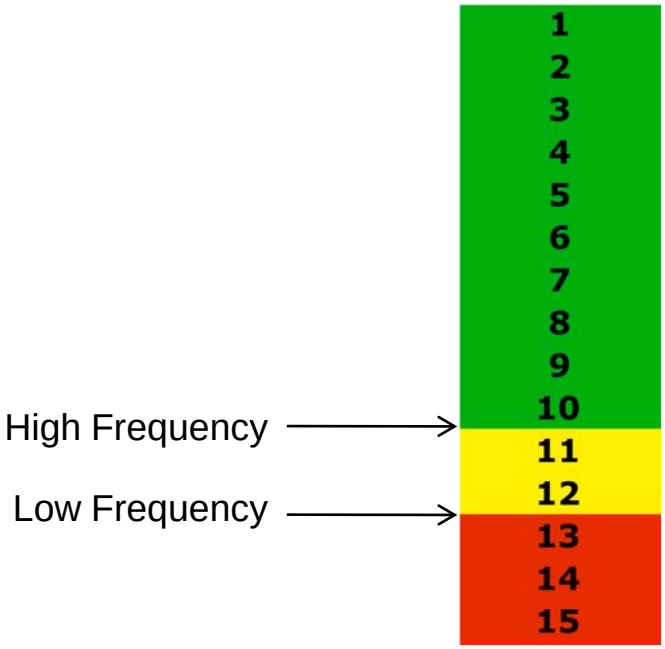
What is relationship between formal individual insurance and community risk management?

Do games impact insurance take-up?

Experimental set-up

Farmers demand more frequent payouts

But were they willing to pay for them?



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Game

Structure

- Player allocates 70 birr (~5 USD)
- Return in fall with insurance payouts using
  - REAL RAINFALL
  - REAL INSURANCE INDEX

Choices for allocation

- Index Insurance—High/Low frequency

- Other options
  - Keep money
  - Savings account (20% interest)
  - Community Risk Pools

Commercial insurance sold in later visit by insurance companies

2010 Results

Surprisingly high demand for insurance

High frequency payouts strongly preferred (86%)

Preference mirrored in commercial sign-up at nearly identical rates

In every village, participants allocated more into index insurance than to the “savings” option.

In two out of four villages, buying index insurance was more popular than taking money home that day

Games very accurately predicted farmer preferences in commercial sales and community savings (unusual)

2010 Results – continued

High frequency insurance may not be best

Different intervention needed?

- Savings Account
- Commitment Mechanism

Next steps:

- Multi year games
- Measure discount rates (during growing season and outside of growing season)

Did game impact commercial insurance sales?

Game followed by commercial insurance sales

Insurance sign up for games participants was statistically significantly higher by ~30%

- Many different possible explanations/reasons
  - Increased financial literacy
  - Trust (a la Suarez 2009, Cole et al 2009)
  - Cash from game (but not much cash)

- Marginal person buying entry level cash contract

Note: take up rate is constrained by project resources

Games cost effective marketing tool?

Return was $1.34 per person part of which goes to insure the risk

Experimental games ~$5 per person+researcher salaries

Only cost effective if games have demand impact when done:

- By sales team without extra visits
- No subject payments
- Residual multi-year impacts

Testing…

Thank you

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Interpreting Results with Logistic Regression

		Logit	w/Village Dummies	w/Clustered Errors
Demographics	**Female**	-.93 (-1.88)*	-1.08 (-2.09)**	-.93 (-1.07)
	Age	.01 (0.59)	.01 (.51)	.01 (0.63)
	Yrs. of Education	-.14 (-1.45)	-.15 (-1.50)	-.14 (-3.53)***
	Adults in HH	.44 (3.90)***	.33 (2.83)***	.44 (1.95)*
	Children in HH	-.15 (-1.35)	-.18 (-1.39)	-.15 (-1.31)
	Muslim	.27 (0.49)	-.35 (-0.58)	.27 (0.47)
Wealth	**Rainfed Land Owned**	-.05 (-0.70)	-.11 (-1.24)	-.05 (-2.09)**
	Irrigated Land Owned	-2.25 (-2.50)**	-1.26 (-1.66)*	-2.25 (-2.62)***
	PSNP	.66 (1.56)	.68 (1.56)	.66 (1.99)**
	Oxen	.15 (0.60)	.14 (0.53)	.15 (1.02)
Decisions	**Borrow money for crops?**	.12 (0.25)	.37 (0.70)	.12 (0.57)
	Borrow money for livestock?	-.71 (-1.01)	-.83 (-1.10)	-.71 (-2.00)**
	Good year?	-.53 (-0.84)	-.12 (-0.19)	-.53 (-0.42)
	Finished planting	1.26 (2.89)***	.70 (1.43)	1.26 (2.59)***
	Used game money for fertilizer or seeds	-.46 (-1.13)	.28 (0.61)	-.45 (-1.19)
	Plan to buy Index Insurance this year?	-1.96 (-1.86)*	-2.03 (-1.84)*	-1.96 (-1.45)
Villages	**Adi Ha**	-	(dropped)	-
	Awet Bikalsi	-	-.85 (-0.80)	-
	Geneti	-	2.04 (2.19)**	-
	Hade Alga	-	1.87 (1.91)*	-
	Constant:	-2.71 (-2.61)***	-4.28 (-3.15)***	-2.71 (-1.47)
# of Obs:		329	329	329
LR chi2:		62.43	77.8	-
Psuedo R^2:		0.2484	0.3096	0.2484

Positive coefficients – Low Frequency

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Negative coefficients – High Frequency

Evidence of wealthier people preferring LF?

2011 Results

	Keep	Savings	Comm. Pool	HF	LF	Game 2
	Mean	Mean	Mean	Mean	Mean	Mean
Tigray 1	38.5	20.3	7.6	12.8	0.8	0.16
Tigray 2	41.9	17	7.2	12.5	1	0.21
Oromia 1	25.8	15.2	10.5	13.1	15.4	0.22
Oromia 2	45.3	10.3	5.7	8.4	10.2	0.22

- Two of the same villages in Tigray region, two villages from Oromia region located hundreds of miles away

- Results vary slightly from 2010 results

- Interesting effects from wealthy village (#3) – Game 2 results very similar, but bought much more insurance

- LF/HF results from Tigray (Village #1-2) are not mirrored in Oromia (Village #3-4)

Comparing Treatment and Control Groups

			By Village			
		Total	Awet Bikalsi	Adi Ha	Geneti	Hade Alga
Control Group	Total households	5295	648	1075	2021	1551
	Purchaser households	834	236	297	125	176
	Non-purchaser households	4461	412	778	1896	1375
	Take-up Rate	15.75%	36.42%	27.63%	6.19%	11.35%
Treatment Group	Total Participants	402	107	98	98	99
	Purchaser	95	32	31	10	22
	Non-Purchaser	307	75	67	88	77
	Raw Take-up Rate	23.63%	29.91%	31.63%	10.20%	22.22%
Two-sided Binomial means test (against control)	p-value	<0.001	0.19	0.37	0.14	0.002

- **Raw take-up is considerably higher for treatment group**

Estimation of Weighted Take-Up Rate for Control Group

		By Village			
	Total	**Awet Bikalsi**	**Adi Ha**	**Geneti**	**Hade Alga**
Total Households	5697	755	1173	2119	1650
$E[Y_i^T]$	23.63%	29.91%	31.63%	10.20%	22.22%
$E[Y_i^C]$	15.75%	36.42%	27.63%	6.19%	11.35%
$\{E[Y_i^T]-E[Y_i^C]\}$	7.88%	-6.51%	4.00%	4.02%	10.87%
$P(x = X)$	1	13.25%	20.59%	37.20%	28.96%
$\{E[Y_i^T]-E[Y_i^C]\}\ P(x = X)$		-0.86%	0.82%	1.49%	3.15%
		4.61%			