Rainfall Insurance and Informal Groups: Evidence from a Field Experiment with Funeral Societies in Ethiopia

Research Team
Oxford University: Daniel Clarke, Stefan Dercon, Ingo Outes,
IFPRI: Ruth Hill and Alemayehu Seyoum
EDRI: Alebel Bayrou

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Outline of presentation

Introduction

- Index-based insurance products hold a promise to provide affordable formal insurance against covariate shocks.
- However, early field experiments encountered only modest uptake (Gine et al. (2008), Cole et al (2009) and Gine and Yang (2008)).

- In this paper, we report the findings of the introduction of index-based insurance products in rural Ethiopia.
- Innovating on previous studies, we explore the benefits of providing insurance through informal risk-sharing groups.
  - The study follows an inducement design: we provide insurance training to group members.
  - And randomize the content of the training sessions across different groups.

- Preliminary analysis shows that uptake is higher when we emphasize sharing of insurance policies among group members.

Index-Based Insurance

- By linking insurance payments to an easily observable index, index-based insurance:
  - Avoids adverse selection and moral hazard problems;
  - Has lower administrative costs - mostly thanks to no expensive loss adjustment;
  - Is a potentially more transparent product than traditional non-index insurance products.
- However, early field experiments so far have not lived up to expectations.
  - In spite of lower costs, loading is still substantial.
  - Low trust between insurer and insuree, conspire against the products. (Insurance requires more trust than credit).
  - Complexity of policies leads to poor understand of products.
- As a result, take up has been poor.

Literature

- In a setting where benefits to insurance purchases are high, what explains low take up? Empirical studies:
  - Gine et al (2008) - India (AP) find demand is correlated with basis risk, wealth and credit constraints.
  - Cole et al (2009) - India (AP and Gujarat) low adoption rates are partly explained by:
    - Demand being sensitive to pricing and credit constraints.
    - Trust is crucial - uptake was higher when product was endorsed by a trusted local agent.
  - Hill, Kumar and Hoddinott (2010)–analysis of correlates of stated willingness to pay point to price, unfamiliarity with financial products and basis risk.
- Theoretical model of rational demand for index insurance (Clarke 2010) highlights basis risk (specifically, probability of no payout when bad event is realised) is a large determinant of demand, particularly for farmers that are risk averse.

Basis risk and risk-sharing groups

- Basis risk reduces the demand for insurance
  - For some farmers, conditions at weather station are a poor proxy for conditions in their fields.
  - Rational agents hedge against basis risk, resulting in potential low demand. (Clarke (2010))
- Some basis risk can be soaked up by groups if idiosyncratic risk is pooled (mutuals for weather risk?). Two key assumptions:
  - Weather station measure is more strongly correlated with group average performance than individual performance.
  - Through sharing rules groups can insure idiosyncratic rainfall risk within the group.

This Study

- Introduce an individual index-based rainfall insurance in rural Ethiopia.
- Policies are marketed through pre-existing risk-sharing groups: iddirs, or funeral societies.
- We selected members of iddirs to be trained in general concepts of insurance and the details of the products.
- Additionally we randomize the content of the training sessions:
  - In some iddirs, training emphasizes the benefits of sharing the policies, and thereby pool basis risk.
- The main hypothesis is that demand will be higher among those trained in the benefits of sharing insurance policies.

Funeral societies as risk-sharing groups

- Widespread presence: 95% of population is a member of at least one iddir
- Most groups are informal - no links with either government or NGOs
- Typical size in most of rural Ethiopia about 50-100 members per iddir

- Iddirs act as informal (or semi-formal) funeral insurance groups. Small mutuals.
- Mostly premium based: regular premiums, payout in cash and kind at time of funeral of member's family
- Many are also involved in insuring other idiosyncratic shocks (e.g. oxen, fire, illness, etc) but have not addressed weather shocks.

A number of reasons why iddirs could help increase demand

1. By pooling basis risk, iddirs can increase demand for index-based insurance
2. Groups might make better decisions.
   - Iddirs leaders are more financially educated
   - Might be best placed for understanding insurance products and explaining them.
3. When groups are used as intermediaries they can increase levels of trust in insurance products.
4. Might relieve credit constraints
   - Risk-sharing groups might provide credit or support to purchase insurance.
   - Particularly, capital-holding Iddirs and groups that offer other services such as credit.

Index-Based Rainfall Insurance

- In collaboration with Nyala Insurance, we introduced index-based rainfall insurance products in 17 kebeles.
- The policies took the form of monthly coupons whereby a fixed payout would be due if the monthly rainfall fell short of a particular precipitation target.
- Policies were calibrated using the historic data from the local rainfall station.
- Eight policies were introduced:
  - Two policies for each of the rainy season months: June, July, August and September.
  - 'Severe Shortfall': For a premium of 100 Birr, the farmer could receive a payment of 500 Birr with a chance of 1/5.
  - 'Very Severe Shortfall': For a premium of 50 Birr, the farmer could receive a payment of 500 Birr with a chance of 1/10.
- Policies could only be purchased by members of pre-existing iddirs.

Intervention Design

- As part of the inducement design we trained both iddir leaders and regular members.
- All training exercises explained the basic concepts of insurance and discussed in detail the workings of the Nyala insurance policies.
- While training for regular members were all identical, the nature of the training provided to the iddir leaders was randomised across iddirs.
  - **Training Exercise A:** Focused on the individual benefits of insurance, and illustrated how to choose the right policy for individual farmers.
  - **Training Exercise B:** Focused on the group benefits of insurance. It illustrated how to choose the right policy for a group of farmers and how Iddirs could play a role by both providing credit and enabling side-payments within the group.

Intervention Design (specifics)

- Using a census of iddirs from 17 kebeles in the Meskan, Silte and Anilemo districts, we sampled the 100 largest iddirs (average of 6 per kebele).
- Iddir leaders (i.e. members of the iddir committee, which typically includes 5-7 individuals) in each kebele were randomly allocated to training sessions A or B
  - Aim: all leaders of one iddir to receive one training type.
  - Reality: incorrect matching of leaders to iddirs resulted in three categories: type A, type B and mixed A&B. Allocation to these three groups was random.
- Iddir leaders nominated regular members to attend training.

	Leaders	Trained Farmers	Non-trained Farmers
Iddir: Type-A	x	x	x
Iddir: Type-B	x	x	x
Iddir: Mixed A&B	x	x	x

Intervention Design (cont.)

- The intervention time frame was as follows:
  1. Mid-May to End-May 2010: Nyala distributed information flyers. Training Exercises carried out.
  2. End-May to End-June 2010: Demand forms collected by Nyala Insurance.
  3. July-September 2010: Insurance policy period.
  4. November 2010: Payout to claimants
- Notes: unusually high pre-season rain and elections

Survey Data

- Soon after the last of the demand forms was collected, we implemented a baseline survey.
- The sampling frame for the survey were the membership of iddirs that took place in the training exercises.
- We draw a random sample of iddir members whereby we over-sampled farmers that had taken part in the training exercises.

	Not-Trained Leaders	Trained Farmers	All Surveyed Farmers
Iddir: Type-A	36	49	85
Iddir: Type-B	27	50	77
Iddir: Mixed A&B	68	95	163
Total	131	194	325

Did Randomization work?

- Using data from the baseline, we test for equality of means across all three categories, and find that all three are very similar.
- From a total of 51 tested variables only five show significant differences between Type-A and Type-B iddirs. We obtain similar results when testing among trained farmers only.
- Type-A in training sample is more often leader of iddir, has a bit more land, more patient than Type-B.
- All results hold with or without adding these controls.

Empirical Strategy

- To estimate the impact of training on insurance demand, we estimate the following interaction model:

$$Demand_i = IddirType_j \otimes Training_i + \mathbf{X}\pi + \mu_v + \varepsilon_i \quad (1)$$

- We include controls for variables that failed the test of equality across iddir types.
- To address the problems of training implementation, we use the following alternative specifications:
  - Iddir Type-A, Iddir Type-B, Iddir Mixed A&B
  - Iddir Type-A + Mixed, Iddir Type-B
  - Iddir Type-B (excluding all groups that were mixed)
- Finally, standard errors are corrected for clustering at the iddir level.

Insurance Uptake

- We record a 42% uptake rate among all trained farmers.
- A 1% take-up rate among non-trained farmers. Survey data suggested those trained did not seem to be aware of the products.
- Across all farmers surveyed in the 17 kebeles we find a 25% take up rate.
- Type A iddirs 37%, type B iddirs 58% and mixed iddirs 36%

Table 1: Insurance Uptake, by Iddir Training Type

	Not-Trained Farmers	Trained Farmers	All Surveyed Farmers
Iddir: Type-A	0.03	0.37	0.22
Iddir: Type-B	0.00	0.58	0.38
Iddir: Mixed A&B	0.01	0.36	0.21
Total	0.01	0.42	0.25

Demand for Insurance, by Iddir Training Type

Table 2: Dependent Variable: Purchase of Insurance Policy

	Core Regressions			Modifying Treatment Definition	
	Naive	Core Controls	Village FE	Default: Type-A + Mixed	Excluding Mixed groups
	LPM	LPM	LPM	LPM	LPM
	(1)	(2)	(3)	(4)	(5)
Iddir: Type-B	-0.0278	-0.0719	-0.1324	-0.0659	-0.0687
	(0.028)	(0.048)	(0.090)	(0.086)	(0.056)
Iddir: Mixed A&B	-0.0131	-0.0378	-0.1149		
	(0.031)	(0.040)	(0.093)		
Trained	0.3396***	0.3640***	0.3554***	0.3796***	0.338***
	(0.077)	(0.077)	(0.071)	(0.048)	(0.075)
(Iddir Type-B) X (Trained)	0.2404**	0.2713***	0.2959***	0.2725***	0.281***
	(0.102)	(0.098)	(0.093)	(0.077)	(0.100)
(Mixed A&B) X (Trained)	0.0036	0.0275	0.0372		
	(0.097)	(0.093)	(0.091)		
R-Squared	0.2337	0.2849	0.3190	0.3165	0.3277
Nr Observations	325	325	325	325	162
Basic Controls	No	Yes	Yes	Yes	Yes
Community fixed effects	No	No	Yes	Yes	Yes

Demand for Insurance, by Iddir Training Type

Table 3: Dependent Variables: Nr of Policies and Value Insured

	Number of Insurance Policies	Total Value Insured
	OLS	OLS
	(1)	(2)
Iddir: Type-B	-0.2214*	-8.0996
	(0.122)	(6.091)
Iddir: Mixed A&B	-0.2494*	-11.8322
	(0.146)	(7.663)
Trained	0.3732***	19.0964***
	(0.091)	(4.801)
(Iddir Type-B) X (Trained)	0.4137***	23.5757***
	(0.119)	(6.526)
(Mixed A&B) X (Trained)	0.1220	12.6217*
	(0.112)	(7.319)
R-Squared	0.2562	0.2276
Nr Observations	326	320
Basic Controls	Yes	Yes
Community fixed effects	Yes	Yes

Was Training-B Different?

Table 4: Dependent Variables: Product Knowledge and Literacy

	Insurance Demand (1)	Do You Know 'Millimeters'? (2)	Insurance Knowledge (3)	Financial Literacy: Probabilities (4)	Financial Literacy: Mathematics (5)
By Training Type					
Iddir: Type-B	-0.1324	0.1645	-0.3531*	-0.1820	0.0362
	(0.090)	(0.137)	(0.211)	(0.281)	(0.292)
Iddir: Mixed A&B	-0.1149	0.2448**	0.0994	0.1953	-0.0837
	(0.093)	(0.103)	(0.181)	(0.284)	(0.284)
Trained	0.3554***	0.3170***	0.1996*	0.0473	-0.1577
	(0.071)	(0.103)	(0.112)	(0.205)	(0.246)
(Iddir Type-B) X (Trained)	0.2959***	-0.0486	0.0186	0.4161	-0.0875
	(0.093)	(0.125)	(0.216)	(0.272)	(0.358)
(Mixed A&B) X (Trained)	0.0372	-0.2775**	-0.1241	-0.0523	0.0768
	(0.091)	(0.124)	(0.151)	(0.238)	(0.302)
Nr Observations	325	324	325	326	326
Basic Controls	Yes	Yes	Yes	Yes	Yes
Community fixed effects	Yes	Yes	Yes	Yes	Yes

How has Training-B worked?

Table 5: Dependent Variables: Talk to Others or Decide with Others

	Trained Farmers		Insured Farmers Only	
	Talked to Others about Insurance?	To how many People (logs)?	When Deciding, Did You Discuss with Others?	Made decision: Alone, Discussed, or Joint Decision
	LPM	OLS	LPM	OLS
	(1)	(2)	(3)	(4)
By Training Type:				
Iddir: Type-B	-0.1137	-0.4498	0.7586***	0.6150
	(0.088)	(0.301)	(0.212)	(0.370)
Iddir: Mixed A&B	-0.1539*	-0.0322	0.0516	-0.1109
	(0.082)	(0.324)	(0.231)	(0.362)
R-Squared	0.1248	0.1415	0.3227	0.2422
Nr Observations	194	194	83	83
Basic Controls	Yes	Yes	Yes	Yes
Community fixed effects	Yes	Yes	Yes	Yes
Sub-Sample	Trained	Trained	Purchased	Purchased

Who is buying? Leaders versus Regular Members

Table 6: Dependent Variables: Insurance Demand. Sample: Excluding Mixed Iddirs

	Type-A and Type B Iddirs Only		
	Default: Trained Leader, Type-A Iddir		
	LPM	LPM	LPM
	(1)	(2)	(3)
Not Trained, Type-A Iddir	-0.3813***	-0.3839***	-0.3376***
	(0.114)	(0.111)	(0.114)
Not Trained, Type-B Iddir	-0.4091***	-0.2466	-0.2842*
	(0.112)	(0.148)	(0.143)
Trained Leader, Type-B Iddir	0.1294	0.2585	0.2342
	(0.153)	(0.181)	(0.177)
Trained Regular Member, Type-A Iddir	-0.0758	-0.1054	-0.0359
	(0.131)	(0.120)	(0.132)
Trained Regular Member, Type-B Iddir	0.2020	0.3806**	0.3985**
	(0.146)	(0.167)	(0.161)
R-Squared	0.2872	0.3871	0.4290
Nr Observations	162	162	162
Basic Controls	No	No	Yes
Community fixed effects	No	Yes	Yes
Sub-Sample	Excl. Mixed	Excl. Mixed	Excl. Mixed

Conclusions

- Still work in progress.
- First study to explore the benefits of sharing index insurance in this setting (mutuals with indexed reinsurance)
- Training of farmers in the benefits of sharing policies generates additional demand for insurance.
- We present evidence that 'group training' findings are not driven by quality of training.
- Instead 'group training' insurees are more likely to make a joint decision. Potentially suggesting some sharing of policies.

- Study suggests that sharing of insurance policies can solve some of the problems of index-based insurance products, and generate higher insurance take-up.
- Future work required to look at mechanisms that drive the results and how to develop the idea further: what kind of sharing rules, how to help groups manage common basis risk etc.