

Sharing rules and demand in semi-formal groups

Guush Berhane, Daniel Clarke, Stefan Dercon, Ruth Vargas Hill
and Alemayehu Seyoum Taffesse

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Motivation

- However well-designed, index insurance products are likely to hold little value when sold as stand-alone products to smallholder farmers.
 - High levels of basis risk
 - Relatively expensive form of insurance
- There may be some utility in combining index products with other well-used forms of risk management that are not well-placed to manage highly covariate risks. In particular we pose the following motivating questions:
 1. Does combining index insurance with group-based risk-sharing provide small-holder farmers with the insurance they need?
 2. Can index insurance be usefully combined with credit and savings activities in risk-sharing groups?
 3. What impact does index-insurance have on well-being (through changes in production or improved consumption smoothing)?

Theoretical motivation: 2×2 state model of index insurance

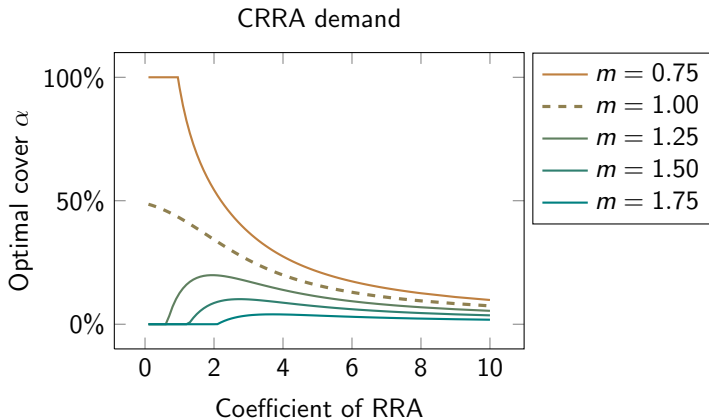
- Initial wealth w , exposed to loss of L
- Loss and index are imperfectly affiliated with joint probability structure:

	<i>Index = 0</i>	<i>Index = 1</i>	
<i>Loss = 0</i>	$1 - q - r$	$q + r - p$	$1 - p$
<i>Loss = L</i>	r	$p - r$	p
	$1 - q$	q	

- Positive basis risk: $r > 0$
- Index and loss are affiliated: $r < p(1 - q)$
- Can purchase indexed cover of αL at premium multiple of m :
 - Premium of $\alpha q m L$ buys claim payment of αL if *Index = 1*
- Consumer is strictly risk averse expected utility maximiser

Rational purchase of indexed insurance

Suppose $p = q = 1/3$, $r = 1/9$, $w = 1.5L$.

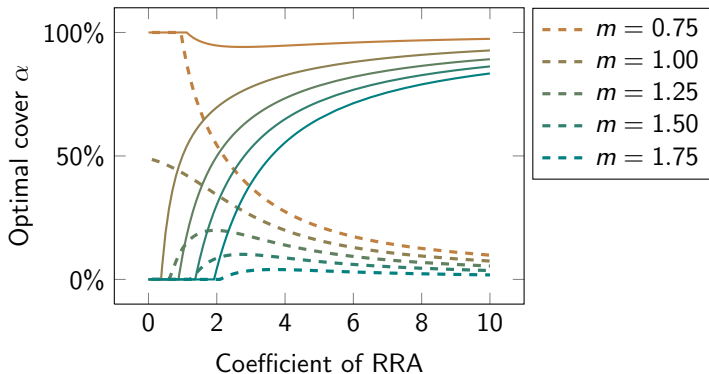


Source: Clarke (2011, PhD thesis, Chapter 1, Figure 1)

Rational purchase of indexed insurance with gap insurance

Now suppose that individuals also purchase gap insurance, which reimburses their premium in the event of 'downside basis risk' event. Suppose pricing multiple for this gap insurance is 3.

CRRA demand, with gap insurance for premium paid



Source: Clarke and Dercon (forthcoming)

Implications of theoretical model

- Gap insurance covering premium is a **complement** to indexed insurance for sufficiently risk averse individuals (Clarke and Dercon, forthcoming)
- Demand for actuarially unfair index insurance with gap cover is **increasing** in risk aversion.
 - cf. increasing then decreasing for index insurance (Clarke 2011, PhD thesis, Chapter 1, Theorems 1 and 2).
- Gap insurance could be provided by local nonmarket risk sharing arrangement...
 - ...so long as index insurance product pays in the event of big aggregate local shocks
- It *could* be optimal for nonmarket arrangements to cover more than just gap insurance for premium paid
 - This level of gap insurance is the minimum required to fundamentally change the nature of demand

Research Questions

This year we have designed the research to test the following hypotheses:

1. Group contracts have higher take-up rates than individual contracts
2. Group contracts increase higher take-up by:
 - 2.1 lowering transaction costs,
 - 2.2 strengthening trust in the insurance product, and
 - 2.3 soaking up basis-risk
3. Group contracts help mitigate basis risk by increasing side-payments
4. Group contracts require ex-ante rules to effectively mitigate basis risk

Testing strategy

Hypothesis	Empirical strategy	Randomization	Data-collection
1. Take-up rates	Compare take-up between group and individual contracts	Randomize contract type at village level	Take-up rates across villages
2.1. Transaction costs	Interact group contract and ex-ante indicators of TCs	Stratification by distance to MFI office	
	Direct comparison of transaction costs for group and indiv		Data on TCs a la Williamson (1981)
2.2. Trust	Interact group contract and measures of trust		Measures of trust and past experiences in iddirs
2.3. Basis risk	Interact group contract and distance to weather station	Stratification by distance to weather station	Data on history of loss and subjective expectations
3. Side payments	Compare side payments in group and individual contract villages		Data on transfers
4. Ex-ante rules	Compare side payments with and without ex-ante rules	Randomize group contracts: with & without ex-ante rules	Data on transfers

Selection of villages

- Villages less than 15km and within 250m of weather station were included
- Iddir network map was completed for a sample of villages to determine geographical spread of iddir. Found:
 - Iddirs require regular meetings so physical distance is a strong determinant of iddir membership.
 - Probability of two villages sharing an iddir falls to less than 10% when villages are more than 1.5km away from each other.
- Used GPS coordinates of villages to randomly selected villages such that no two villages less than 1.75km apart would be included in the sample.
 - Reduce probability that iddir network of one village overlaps with iddir network of a village selected for a different treatment.

Randomization of villages

- 60 villages designated as control villages.
- 90 villages in which insurance is offered:
 - 40 offered an individual contract,
 - 50 offered a group contract.
 - Half the iddirs were asked to fill in a demand form in which they selected an ex-ante sharing rule (or wrote one of their own). They were also free to choose no sharing rule. Form forced the discussion.
- Villages randomized to ensure distance to weather station was distributed equally across these groups.

Baseline risk sharing within iddirs and villages

- Majority of households are members of iddirs to whom they are making ex-ante monthly payments.
- Iddirs are doing quite a bit of risk-sharing, offering much more than funeral insurance.
- Sometimes for agricultural production and losses.
- Some transfers within iddir members, but overall few transfers observed within the village. Supplemental survey may be needed.

Baseline risk sharing within iddirs and villages

	Mean	Median
Household is a member of an iddir with ex-ante payments	0.90	
Size of regular monthly payment, Birr	7.5	5
Household belongs to an iddir that makes payouts for more than funeral	0.36	
Reason for payout:		
Fire	0.64	
Illness	0.25	
Wedding	0.17	
Loss of Oxen	0.11	
Harvest loss	0.04	
Household belongs to an iddir that makes loans for more than funeral	0.52	
Reason for loan:		
Illness	74	
Agricultural inputs	33	
Fire	24	
Wedding	22	
Harvest loss	17	
Household reports intra-village transfer	0.12	
Household belongs to eqqub	0.09	

Sharing rule game: group contract villages

1. Play game without index insurance
 - Good or bad weather recorded at the weather station, and good or bad harvests on field.
 - Observed that some will have better harvests than others and discussing why that might be.
2. Play game with index insurance (but no sharing rule) and discuss
 - Now there is a choice to buy insurance which will pay when the weather at the weather station is bad.
 - This will not cover all bad harvests, but will help.
3. Play game with index insurance and with sharing rule and discuss
 - Allow individuals to contribute to a group pot and agree a sharing rule.
 - Discuss how this could help cover bad harvests when insurance does not pay.

Sharing rule game: group contract villages

Note: All games played twice, once with good and once with bad weather



(a) Good weather tokens



(b) Bad weather tokens