The Effect of Weather Insurance in Developing Countries' Rural Areas

Lessons for Successful Microinsurance Models

Milana Ruffin
Georg-August University Göttingen
MSc Candidate

Agricultural Economics
milanaruffin@gmx.de

November 5, 2009 Dakar, Senegal

OVERVIEW

- Introduction
- Theoretical Premises: Index Insurance and Microcredit
- Empirical Study Settings: India
- Study Findings and Explaining the Results
- Conclusion: Lessons for Successful Weather Insurance Schemes

1. INTRODUCTION

- Risk is a fundamental obstacle to investment
- Much research focused on self-insurance substitutes:
  - *ex ante* risk management (e.g. SKEES et al. 2002)
  - *ex post* risk coping (e.g. ROSENZWEIG, WOLPIN 1993)
- Relatively little research on impact of weather insurance purchase on investment behaviour

  (GINE et al. 2009, COLE et al. 2009)
- **Relevance:** Weather insurance may be both efficiency enhancing and welfare enhancing

2. THEORY

What is the effect of rainfall microinsurance on the pattern of microcredit uptake?

Competing hypotheses:

- Hypothesis 1: complementary goods
- Hypothesis 2: substitute goods
- Hypothesis 3: independent goods

Policy-Relevance: Should index insurance be marketed as 'bundled schemes'?

Insurance and credit: complementary goods

Complementary Goods

= two products for which an increase in demand for one leads to an increase in demand for the other

Reasons:

1. Insurance should reduce risk aversion by reducing farm income variability
2. Formal credit should be more easily accessible as insurance itself can be seen as a *de facto* collateral (BARDHAN, 2004)

Number and size of microcredits should increase

Formal credit access should expand

Insurance and credit: substitute goods

Reasons:

1. Poor smallholders face relatively high direct costs and OC ⟹ lack of liquidity to pay for rigid and early credit instalments
2. In the aftermath of a weather shock, timely insurance payout obviates emergency credit

Number and size of microredits should decrease

Insurance and credit: independent goods

3 OBSTACLES TO SEEING AN EFFECT

DEMAND SIDE

1. Financial illiteracy

- Little understanding of complex workings of index insurance
  - Financial literacy found to be low in DCs (COLE et al. 2008, GOFFREY 2008, DFID 2008)

Insurance and credit: independent goods II

2. **Uncertainty** about benefits of index insurance:

$$E[U(\text{insured} \mid C_{Premium}, OC, \mu_{basis\ risk} * C_{basis\ risk})]$$

$$>$$

$$E[U(\text{uninsured} \mid \mu_{weather\ shock} * C_{weather\ shock})]$$

Where C = cost, OC = opportunity cost, μ = probability and U = concave utility function, assuming constant relative risk aversion.

Basis risk can be defined as the potential mismatch between insurance payout and actual harvest loss at the farm level.

Source: Own Representation

Insurance and credit: independent goods III

SUPPLY SIDE

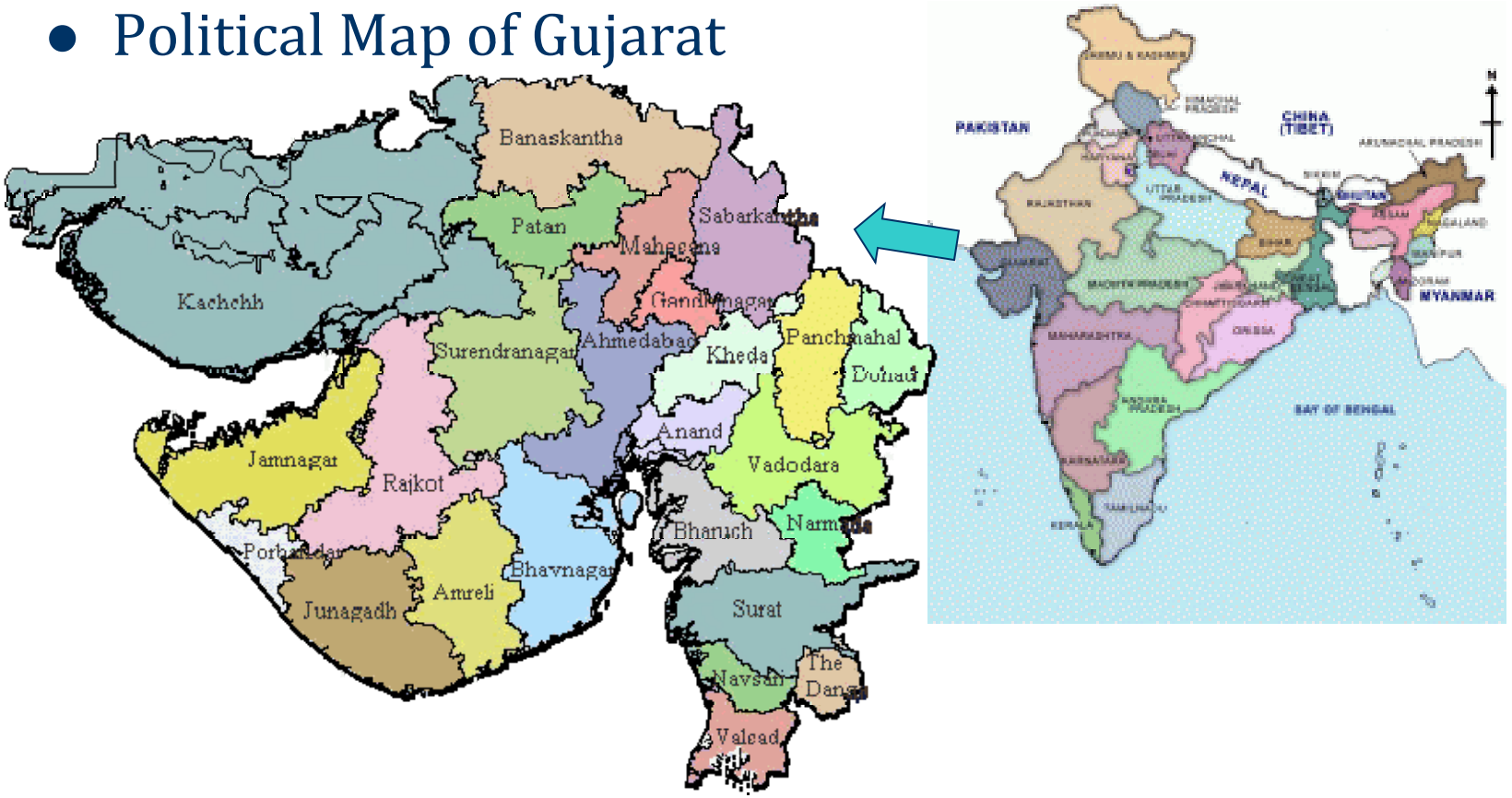
3. **Lack of responsiveness** from formal credit sources
   - Financial services providers such as nationalised banks may be slow to adjust
   - Do not consider index insurance as *de facto* collateral

3. STUDY SETTINGS: GUJARAT

- Index insurance introduced in 2006 in Gujarat
- Collaboration of
  - Self-Employed Women's Association (SEWA)
  - Centre for Microfinance Research
  - Harvard Business School
  - Insurance companies (ICICI-Lombard, IFFCO-Tokyo, AICI)
- For both smallholders and agricultural labourers
- Index insurance marketed by SEWA

STUDY SETTINGS: GUJARAT

- Political Map of Gujarat

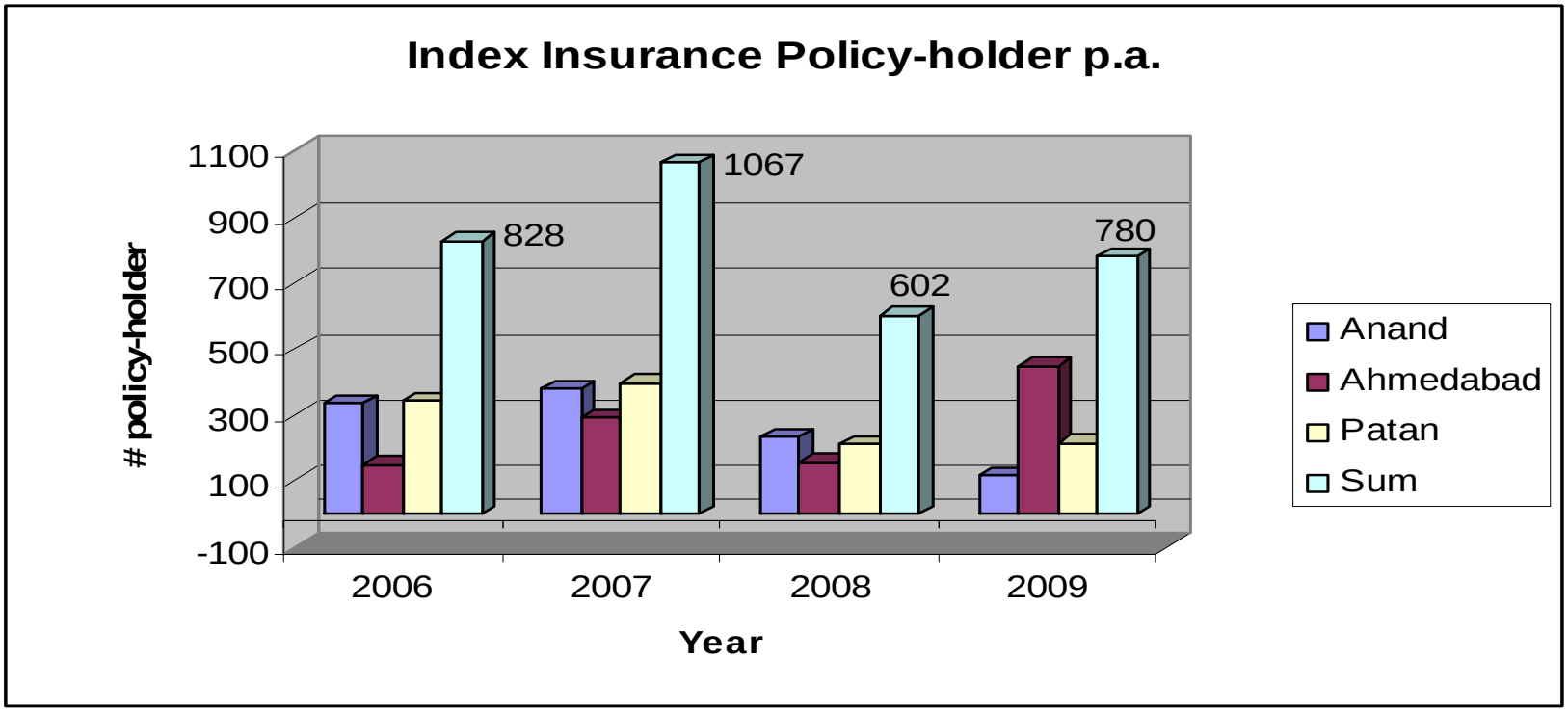


STUDY SETTINGS: GUJARAT

Year	2006	2007	2008	2009
Insurance Company	ICICI Lombard	IFFCO-Tokyo	ICICI Lombard	AICI
Rainfall Parameter	Excess and Deficit	Deficit	Excess and Deficit	Excess and Deficit
***Kharif* Crop Insured**	Any	Any	Any	Any
# Cover Phases	3	1	1	3
Policy Duration/days	110	92	90	142
Level Weather Data	District	District	District	Bloc

4. QUANTITATIVE FINDINGS

- Variable index insurance uptake



QUALITATIVE STUDY

Participants' Characteristics	5 villages N=71
# Female	64
# Smallholder farmers	41
Ø Age	38
Medium land size: *bigha* *hectare* Average land size: *bigha*	1 0.23 3.1
Ø Buffalos owned	1 (0.86)
Never attended school	41
Completed 10th Standard and above	3

QUALITATIVE FINDINGS

- **Majority of smallholders and ag. labourers**
  - Puzzle: Feel more secure with index insurance
  - Yet they did not take out more or larger credits as a result of index insurance purchase
  - Did not change purpose or source of microcredit as a result of index insurance purchase
  - Many ag. labourers continued to use informal microcredits for emergencies. Smallholders for planned pre-harvest ag. investments

GUJARAT: QUALITATIVE FINDINGS

- Little support for ‘substitute’ goods thesis
- No support for ‘complementary goods’ thesis
- Support for ‘independent goods’ thesis

INDEPENDENT GOODS THESIS: EXPLAINING RESULTS IN GUJARAT

DEMAND SIDE

1. Financial illiteracy:

- Understanding of concept of insurance low: *"I paid for insurance last year but not this year, why don't I get a payout this year when everyone else gets one?"*
- Understanding of index insurance low
- Smallholders and ag. labourers tend to only buy one policy
- Regardless of level of schooling

INDEPENDENT GOODS THESIS: EXPLAINING RESULTS IN GUJARAT

DEMAND SIDE

2. External Risks

- Non-agricultural, external risk: Crop failure due to water logging
- It was understood that this was not covered by index insurance
- Is deficit/excess rain the most important risk?

INDEPENDENT GOODS THESIS: EXPLAINING RESULTS IN GUJARAT

DEMAND SIDE

3. Intra-household decision-making

- Bargaining decision-making for index insurance purchase
- Unitary decision-making for larger investments or credits for productive purposes
  - Husbands and fathers, uninformed about workings of index insurance, continue to make most financial decisions

INDEPENDENT GOODS THESIS: EXPLAINING RESULTS IN GUJARAT

SUPPLY SIDE:

1. No formal credit expansion:

- Providers do not seem to regard index insurance as de facto collateral

2. Rigid microcredit instalments

- Continuing problem for smallholders with lumpy, seasonal income

5. LESSONS FOR SUCCESSFUL MICROINSURANCE MODELS

- Greater educational effort needs to be made to all family members and throughout the year regarding both insurance as a concept and index insurance
- Greater information dissemination efforts need to be made to financial services providers

LESSONS FOR SUCCESSFUL MICROINSURANCE MODELS

- *Ex ante* feasibility assessment of index insurance should include institutional/political (i.e. non-weather related) risks
- Index Insurance on micro-level should not be bundled – **if** facing rigid credit instalments
- What is the appropriate target market (micro-level or meso/macro-level) for index insurance?

THANK YOU.

Milana Ruffin

maximiliane.ruffin@gmail.com

Alan Fuchs (quantitative study on Mexico)

afuchs@are.berkeley.edu