

# Paying Premiums with The Insurer's Money: Insurance Decisions in a Repeated Interaction



**INSURANCE DECISIONS IN A REPEATED  
INTERACTION**

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# India and Monsoon Rainfall



- 50% of Indians engaged in Agriculture, and 60% of farmers rely on the Monsoon rain
- Monsoon is notoriously erratic and unpredictable
- Traditional coping mechanisms struggle to deal with aggregate shocks such as droughts and floods

# Rainfall Index Insurance



- Microinsurance product designed to help protect the very poor against droughts and floods
- Contract written on rainfall at local weather station

# Market Situation



- Rainfall Index insurance is generally not succeeding in the private market, especially without subsidies and loan ties
- Even government-run AIC is scaling back its efforts, despite the huge cost savings it provides over traditional insurance

# First Reasons



- Lack of Trust
- Lack of Understanding

The Solution?

# First Reasons



- Lack of Trust
- Lack of Understanding

The Solution?

**Stay the Course**

# Second Problems



- Basis Risk
- Heavy Loading
- Insurance not needed

The Solution?

# Second Problems



- Basis Risk
- Heavy Loading
- Insurance not needed

The Solution?

**Give Up (Or Big Changes)**

# The Key Notion



- If insurance is really a good product, receiving payouts will spur repeat buying.

# Research Questions



- Are insurance customers more likely to purchase insurance after they have received an insurance payout?
- If so, what are the mechanisms that drive this decision?
- Can we describe these decisions with a model of loss aversion?

# Preview of Results



- Customers are 10-20% more likely to purchase insurance the year after they have received an insurance payout.
- This seems to be driven by the actual reception of money, and not by increased trust or salience of weather shocks.

# Outline of The Talk



- Details of Index Insurance and Data Used
- Look at simple correlation of payouts and renewals
- Present theory of renewals based on loss aversion ('Gambling with House Money')
- Show data is consistent with this theory
- Show data is not supportive of alternative theories such as:
  - Direct effects of weather on purchasing
  - Trust, Learning, and other effects that would have spillovers
- What does this mean for the insurance industry?

# Rainfall Index Insurance



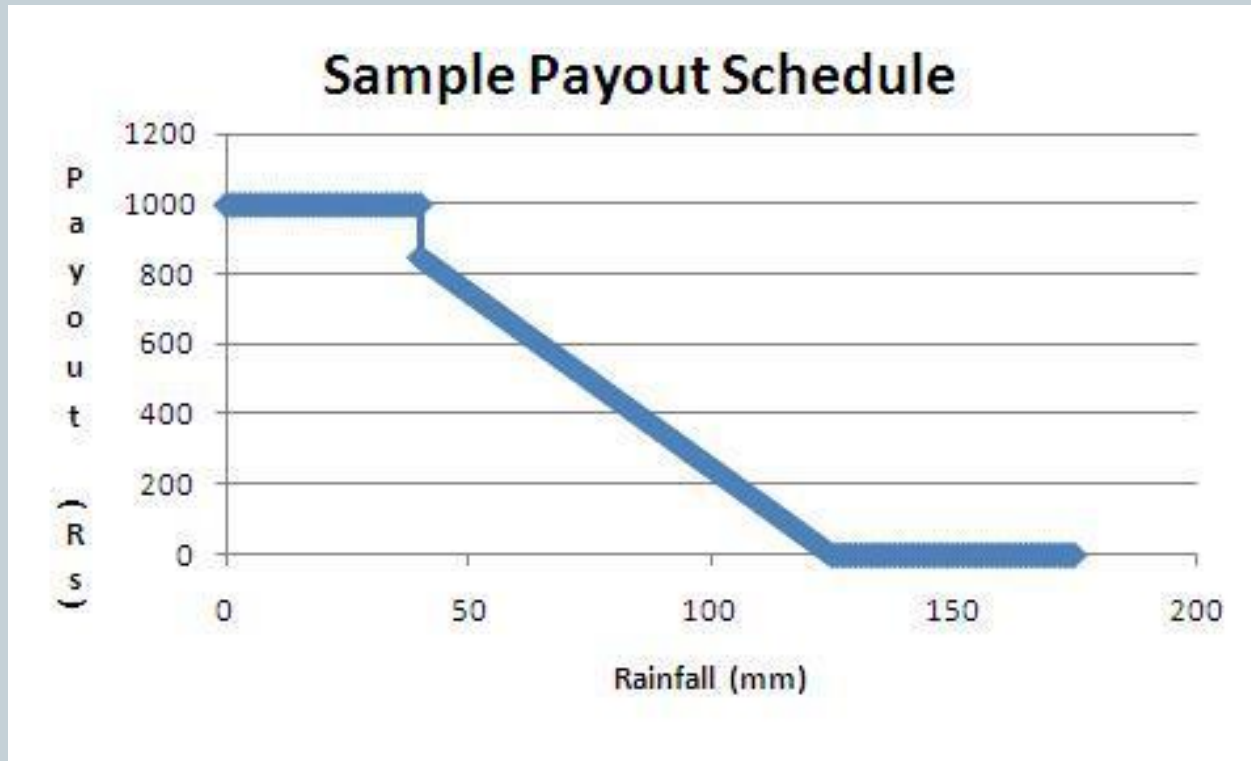
- Contract based on rainfall at a local rainfall station
- Covers deficit or excess rain
- Based on cumulative rainfall in a given 'phase'

# Sample Policy



Phase	I	II	III
Duration (Days)	35	35	35
Type	Deficit	Deficit	Excess
Strike (mm)	135	125	730
Exit (mm)	40	40	820
Notional (Rs/mm)	10	10	10
Policy Limit (Rs)	1000	1000	1000
Premium (Rs)	110	110	90

# Payout Scheme



# Basix Data



- All monsoon insurance purchasers from 2005-2007
- 19,882 customer data points
- Daily Gridded Rainfall Insurance data from APHRODITE

# Summary Statistics



Year	2005	2006	2007
Number of Villages	954	1426	432
Number of Weatherstations	34	42	28
Number of Buyers	6428	10077	3377
Average Sum Insured (Rs)	3055	1612	3547
Buyers Receiving Payouts	351	1346	529
Buyers Who bought the Following Year	453	364	

# Data Issues



- **Matching Errors**
- **Marketing Intensity**

# Question 1



- Are customers more likely to purchase insurance after they have received a payout?



Dependent Variable is Customer Re-Purchasing Insurance

	(1)	(2)	(3)	(4)
Received Payout	0.0784*** (0.0224)	0.0897*** (0.0242)	0.169*** (0.0394)	0.222*** (0.0442)
Year 2006 Dummy	-0.0222** (0.0107)	-0.0251** (0.0111)	-0.0216 (0.0271)	-0.0269 (0.0274)
Constant	0.0705*** (0.00886)	0.0704*** (0.00901)	0.171*** (0.0185)	0.165*** (0.0172)
State Fixed Effects	NO	YES	NO	YES
Marketing Restricted Sample	NO	NO	YES	YES
Observations	11002	11002	4202	4202
R-squared	0.010	0.014	0.020	0.035

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Observations are all buyers in 2005 and 2006

robust standard errors in parentheses

All errors clustered at the village level

# Initial Results



- Buyers are more likely to purchase insurance after getting a payout, but only by 10-20%.

# Possible Explanations



- Learning about insurance
- Trust in Insurance Company
- Autocorrelation of weather (real or perceived)
- Changing risk aversion
- Cash flow issues
- Salience of rare events
- Psychological effect of payout
- Insurance as Investment

# Three Channels



- Weather Channel
- Trust/Learning Channel
- Cash Flow Channel

# Theory: The Cash Flow Channel



- Loss aversion model where receiving a payout moves the reference point
- After a payout, future premiums are ‘cheaper’ in terms of utility
- Similar argument to ‘Gambling with House Money’ by Thaler and Johnson (1990)

# Utility Function

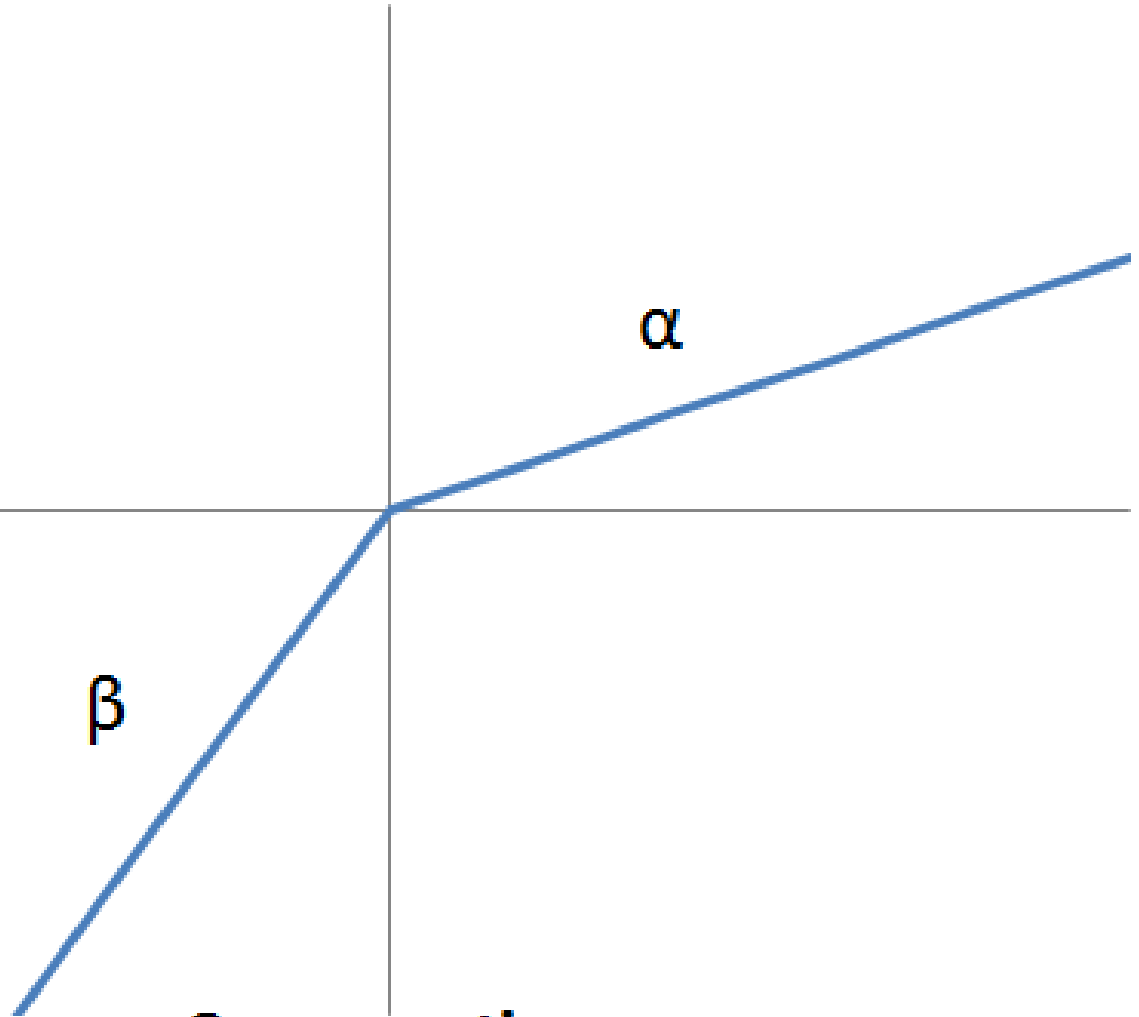


**Utility**

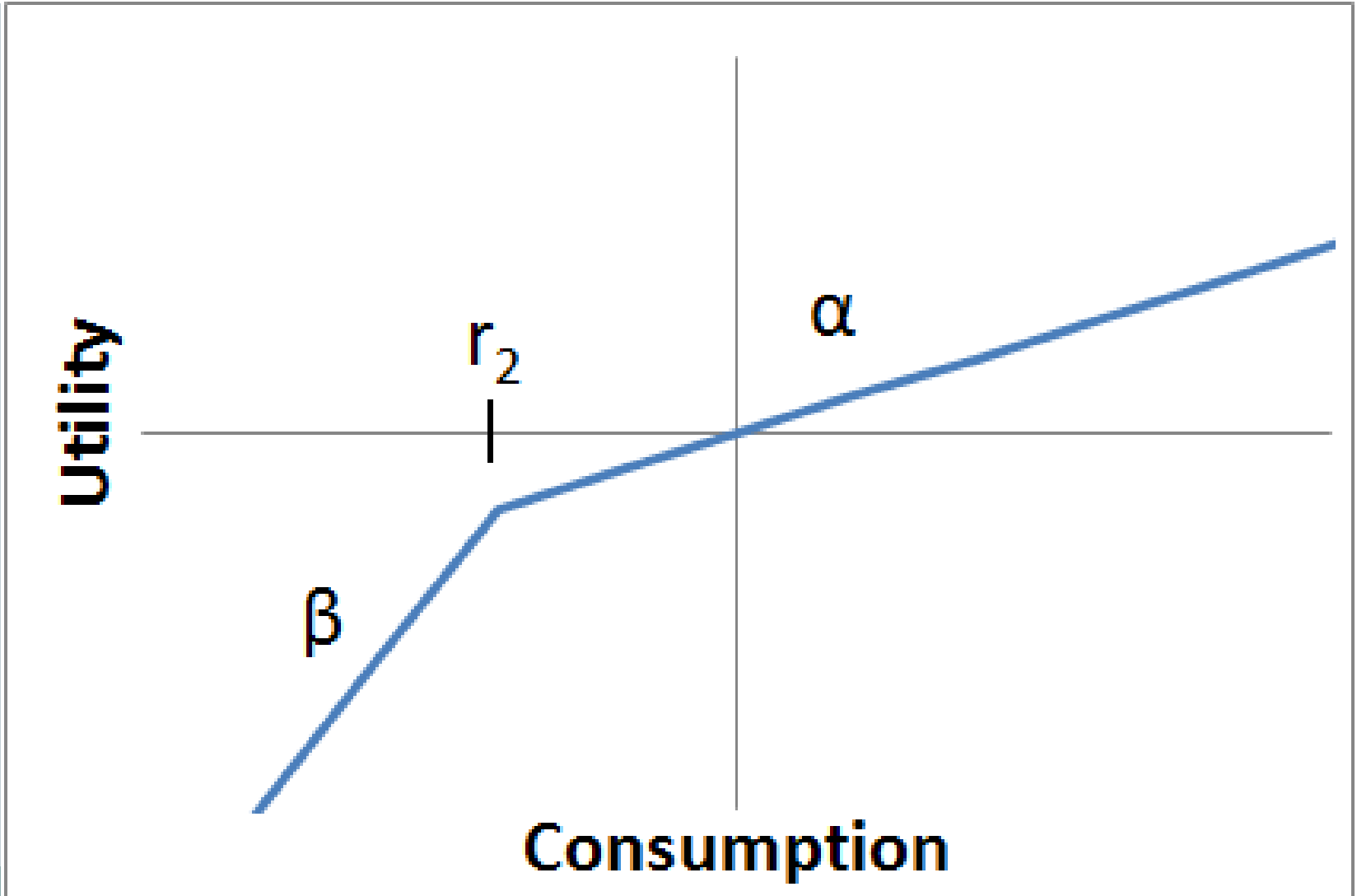
$\beta$

$\alpha$

**Consumption**



# Utility Function After Insurance Payout

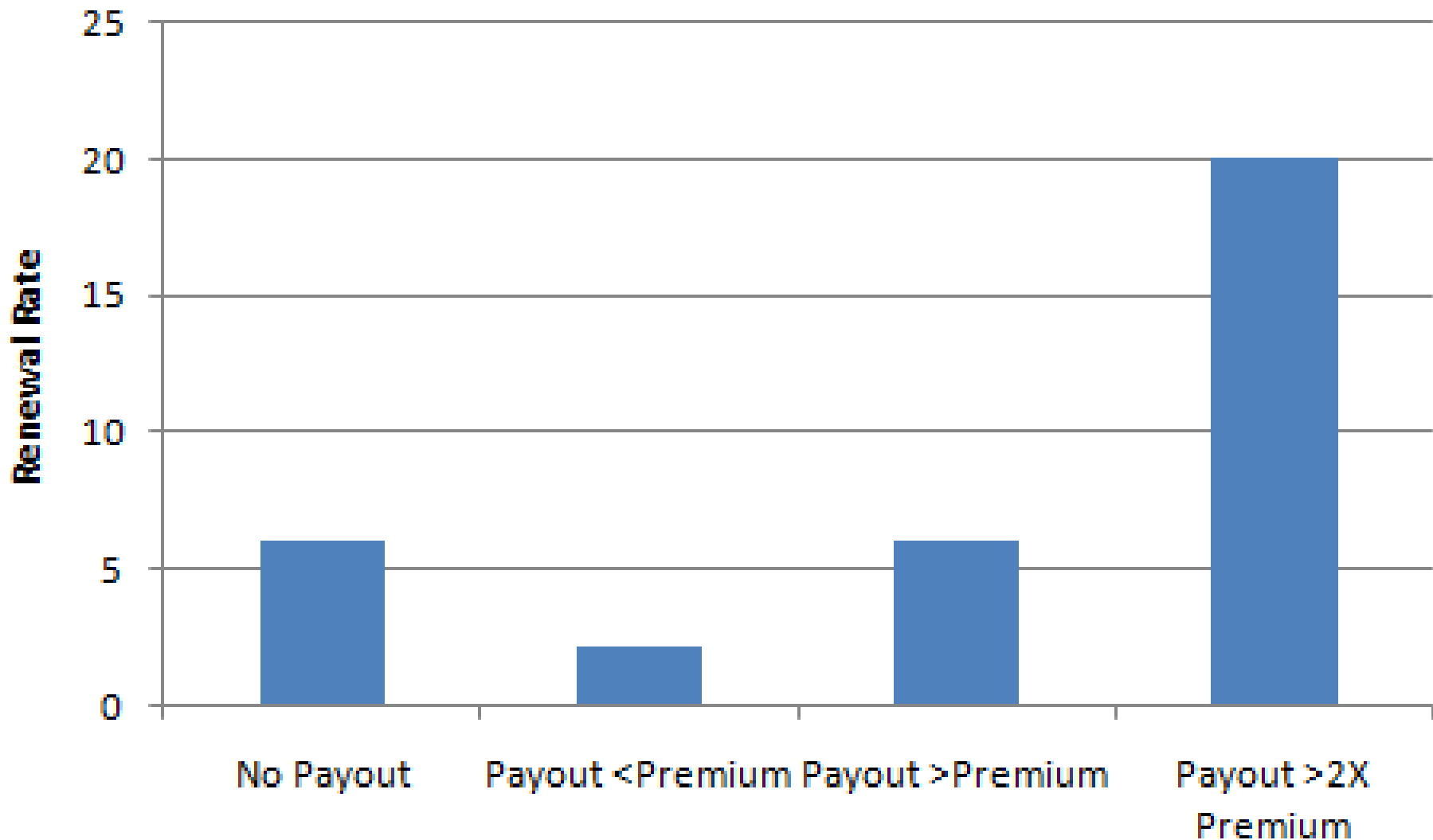


# Theory Predictions

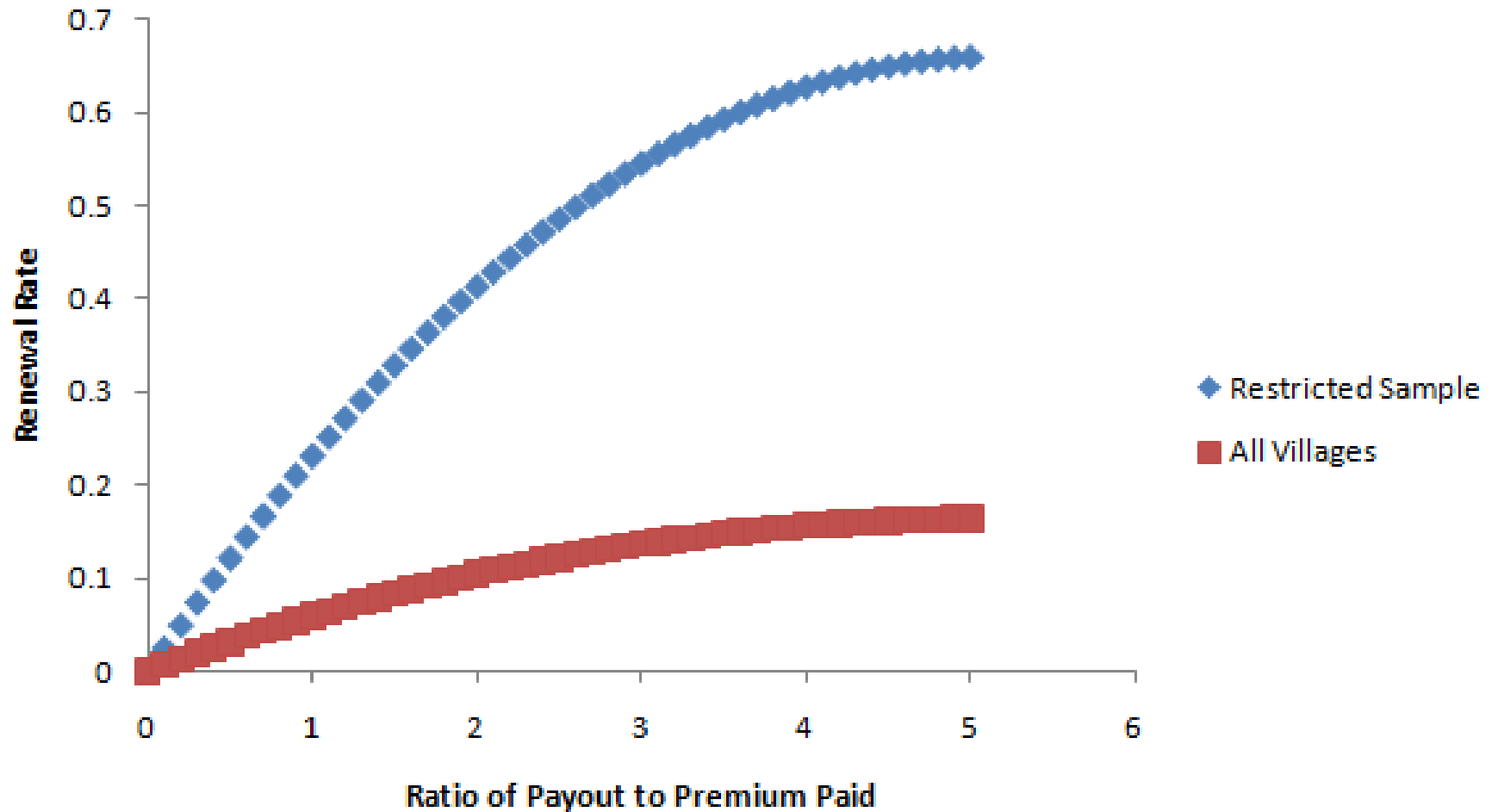


- People are more likely to purchase after receiving a payout.
- Payouts below the premium paid will not induce more purchasing
- Payouts will have the largest affect when they are greater than two times the premium.

# Payout Rates (All Villages)



# Payout Size Effects



# Alternative Explanation: The Weather Channel



- Maybe the direct effects of the rainfall shock the preceding year affect insurance demand the following year.
- If this was true, insurance companies could target places that had experienced recent shocks
- To test this, I look at villages in the first year they had insurance available to see whether a rainfall shock in the preceding year affected demand,

	Dependent variable is number of buyers in 2005			
	(1)	(2)	(3)	(4)
Would Have Been Payout in 2004	-3.155*** (0.942)	-3.728*** (0.967)	-2.044 (1.321)	-3.572** (1.448)
Would Have Been Payout in 2003	1.436 (1.592)	1.717 (1.306)	0.0170 (1.261)	-0.765 (1.037)
Would Have Been Payout in 2002	-2.329* (1.226)	-0.406 (0.987)	0.0179 (1.292)	2.856* (1.414)
Historical Average Rainfall			-0.0143** (0.00620)	-0.0153** (0.00590)
Historical Rainfall Standard Deviation			0.0447** (0.0171)	0.0834*** (0.0247)
Premium in 2005 (Rupees)			-0.0201 (0.0142)	-0.0410* (0.0215)
Historical Average Payout			0.0104 (0.0166)	0.0403 (0.0302)
Percentage of Years With Payout			-16.76 (10.99)	-16.01 (12.21)
Constant	8.456*** (0.859)	7.795*** (0.735)	18.91* (9.869)	15.03* (8.107)
State Fixed Effects	NO	YES	NO	YES
Observations	734	734	733	733
R-squared	0.053	0.079	0.084	0.106

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Observations weighted by quality of rainfall data

Robust standard errors in parentheses

Errors Clustered at Weatherstation Level

# The Weather Channel Conclusion



- If anything, people are less likely to purchase insurance after receiving a rainfall shock
- This result is not too robust to alternative shock definitions

# Alternative: Trust/Learning Channel



- Idea: People should be able to gain trust and learn about insurance if they have witnessed insurance payouts but have not actually received them.
- If these people are more likely to purchase insurance, they have likely been affected by Trust/Learning (and maybe the weather too)

# Trust/Learning



- The sample: People who purchased insurance in 2005, and had it available in their village in 2006 but didn't purchase in 2006

# Trust/Learning Channel



	Insurance Purchasers In 2007	
	(1)	(2)
Large Payout In Village	0.0121 (0.0357)	0.0372 (0.0768)
Received Large Payout	0.144*** (0.0414)	0.228*** (0.0811)
Constant	0.0412*** (0.00753)	0.127*** (0.0187)
Marketing Restricted Sample	NO	YES
State Fixed Effects	YES	YES
Observations	6,327	2,178
R-squared	0.057	0.083

# Trust/Learning Channel



- There does not seem to be evidence that witnessing payouts can induce more purchasing
- In the paper, we also confirm this result with village level data

# Conclusion



- People who receive payouts are 10-20% more likely to purchase rainfall insurance the next year.
- This seems to be driven by the actual reception of cash, as opposed to affects of trust/learning and weather.
- These results suggest that the rainfall insurance industry will not survive in its current form.

# Policy Suggestions



- Customers are not happy with this breed of index insurance
- Index insurance products need to improve if they are to become viable
- Less basis risk, lower cost needed
- Questions as to whether index insurance is the right product in this market.