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Potential role of regret in farmers' land conversion decisions

Results from an economic experiment

Mary Doidge

Department of Agricultural, Food, and Resource Economics
Michigan State University
doidgema@msu.edu

David Hennessy

Department of Agricultural, Food, and Resource Economics
Michigan State University
hennes64@msu.edu

Hongli Feng

Department of Agricultural, Food, and Resource Economics
Michigan State University
Hennes65@msu.edu

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Potential role of regret in farmers' land conversion decisions

Mary Doidge¹, David A. Hennessy², Hongli Feng³

¹Ph.D. Candidate, ²Professor and Elton R. Smith Chair of Food & Agricultural Policy, ³Associate Professor
Department of Agricultural, Food and Resource Economics. Michigan State University



Motivation

Conversion of grassland to cropland in the Prairie Pothole Region of North and South Dakota is of increasing ecological concern. Conversion of land to land suitable for row crop production often results in loss of migratory bird breeding habitat, release of sequestered carbon, and increased input use. However, a comparison of land values suggests under-conversion from an economic standpoint, such that farmers may decide to leave land in grass despite the potential for higher returns from cropping.

We propose that regret plays a role in farmers' conversion decisions, causing them to leave their land in grass when conversion to cropland would be more profitable. The potential for regret arises when the payoff from the chosen action is less than the payoff that would have been received if another action was taken (Loomes and Sugden, 1982). Regret theory has been used to explain deductible choice in insurance contracts (Braun and Muermann, 2004), and low auction bids (Filiz-Ozbay and Ozbay, 2007)

In this work, we investigate the potential role of regret in farmers' land conversion decisions, using data from a framed land conversion experiment. We explore whether making regret salient by asking farmers how they feel about their conversion decisions impacts their decision ex ante. We also explore what makes farmers more likely to express regret about their land use decisions.

Empirical Methods

Regret salience and conversion Decisions

- We first compared rates of conversion between participants who received the regret and control versions of the experiment
- We then used probit regressions to estimate the impact of regret salience and the regret-maximizing land use on the probability that a farmers converts his land

$$p(\text{convert}_{ijt}) = \Phi(\gamma_0 + \gamma_1 \text{regret}_{it} + \gamma_2 \text{crop_regret}_j + \gamma_3 \text{round}_{ij} + \gamma_4 \mathbf{y}_i + \mu_i)$$

convert_{ijt} indicates participant i converted his land in period t of round j
 regret_{it} indicates participant i completed the regret version
 crop_regret_j indicates regret for crop was higher than for grass in round j
 round_{ij} round control variable
 \mathbf{y}_i vector of individual-specific variables
 Φ standard normal CDF

Stated Regret

- A dummy variable was created to denote that at least some regret was expressed (1 if regret=3, 4, or 5; 0 otherwise)
- The probability that participant i expresses regret about his land use decision in period t of round j is modelled as

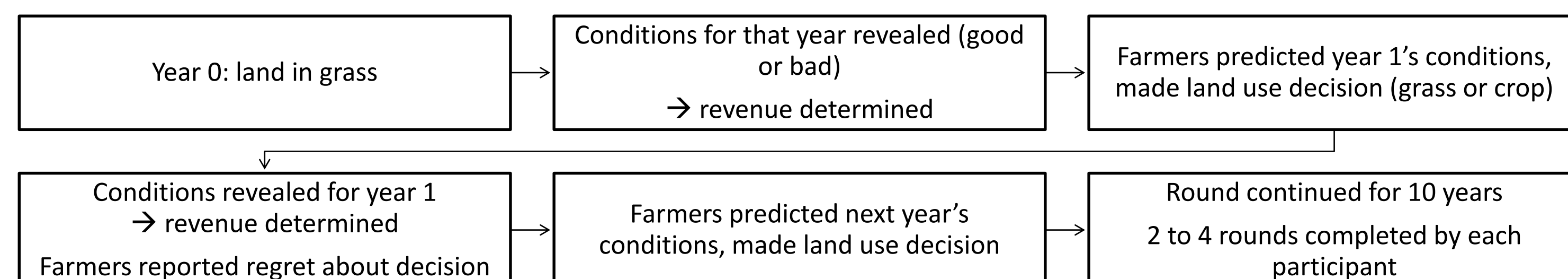
$$p(\text{some_regret}_{ijt}) = \Phi(\rho_0 + \rho_1 \text{convert}_{ijt} + \rho_2 \text{crop}_{ijt} + \rho_3 \text{round}_{ij} + \rho_4 \mathbf{y}_i + \mu_i)$$

some_regret_{ijt} indicates participant i felt some regret in period t of round j
 convert_{ijt} indicates participant i converted his land in period t of round j
 crop_{ijt} indicates participant i had his land in crop in year t of round j
 round_{ij} round control variable
 \mathbf{y}_i vector of individual-specific control variables
 Φ standard normal CDF

Data and Experimental Procedure

- Experiments were conducted with 64 farmers in four locations in the Prairie Pothole Region in the two states
- Farmers were asked to suppose they had a plot of land currently in grass, which could be converted to cropland for a yearly conversion cost
 - Weather and market conditions could be either good or bad
 - Yearly revenue was determined by the chosen land use and stochastic weather and market conditions
- Farmers were compensated a percentage of their total revenue from one round, chosen at random
- To examine how making regret salient to farmers impacted their conversion decision, two version of the experiment were used
 - 31 of the 64 participants received a version of the experiment that asked them to state how they felt about their land use decision on a scale from 1 (happy with their decision) to 5 (regret their decision)

Experimental procedure:



Results

Table 1. Comparison of conversion decision by experiment version

Version	N	Mean conversion rate	χ^2 p-value
Control	33	0.115	0.001
Regret	31	0.072	

Figure 1. Conversion rates, by version

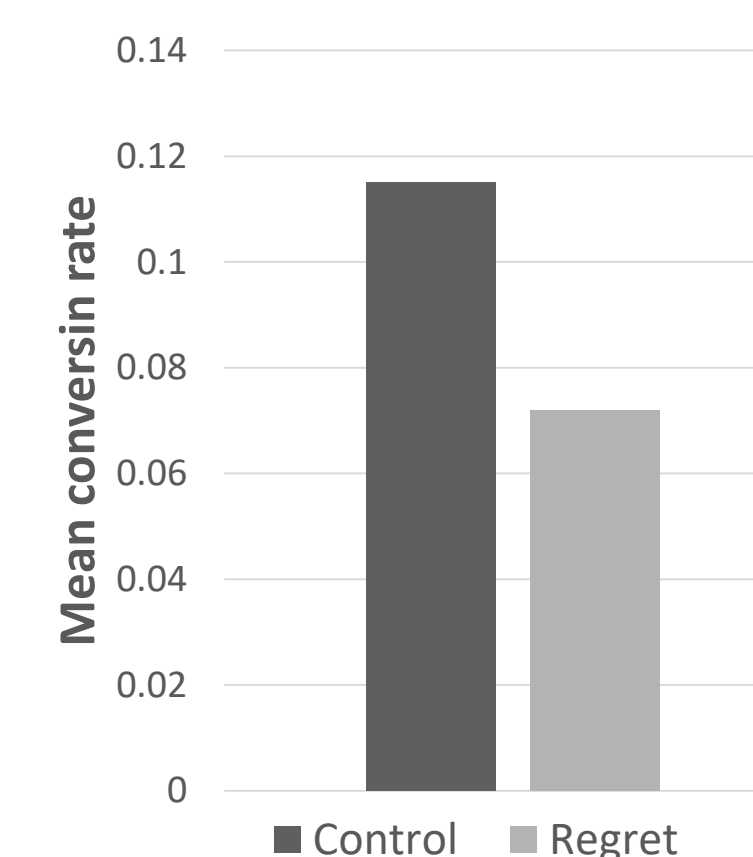


Table 2. Probability of converting land in period t (Probit marginal effects reported)

	Conversion decision	
Regret version	-0.043*	-0.052**
Maximum regret from crop	-0.077***	-0.076***
Round controls	Yes	Yes
Farmer-specific controls	No	Yes
Observations	1,980	1,860
Log likelihood		

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

Table 3. Probability of expressing some regret about land use decision (Probit marginal effects reported)

	Some regret	
Convert	0.032	0.035
Crop	0.066**	0.076***
Correct prediction	-0.078***	-0.099***
Round controls	Yes	Yes
Farmer-specific controls	No	Yes
Observations	911	831
Log likelihood		

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

Discussion

Our experimental results show that farmers converted land less often when regret was made salient: conversion rates were lower among farmers who received the regret version of the experiment. While we do not observe that regret is felt more for conversion decisions than when farmers leave land in its current use, he results suggest that they are more likely to express regret about land in crop rather than grass.

Land converted from grass to cropland is often of marginal quality, and may be more likely to be removed from cultivation if market fluctuations make crop production less feasible. It is likely that much of the ecological damage of conversion out of grass cannot be undone (e.g., carbon released into the atmosphere by cannot be un-released, breeding habitat for migratory birds is easier to destroy than to re-establish).

If landowners more carefully consider how they may feel about their future feelings of regret, they may decide not to undertake the initial conversion, thus saving spending resources that they may regret in the future.

Agencies wishing to slow rates of land conversion could appeal to farmers' anticipated regret, making them consider how they may feel about their decision ex post.

References

- Braun, M., Muermann, A. 2004. The impact of regret on the demand for insurance. *Journal of Risk and Insurance* 71(4):737-67.
- Filiz-Ozbay, E., Ozbay, E.Y. 2007. Auctions with anticipated regret: Theory and experiment. *American Economic Review* 97(4), 1407-1418.
- Loomes, G., Sugden, R. 1982. Regret theory: An alternative theory of rational choice under uncertainty. *Economic Journal* 92(4), 805-824.