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Cellule de Veille et de Prospective sur la Politique Agricole Commune

INRA SCIENCE & IMPACT

Workshop
Economic Experiments for EU Agricultural Policy Evaluation: Methodological challenges
6-7 June 2017

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Using economic experiments for agricultural policy evaluation in Lower Saxony, Germany

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Outline

Mainly based on

"Greening the Common Agricultural Policy – Insights from a Framed Field Experiment in Lower Saxony, Germany."

By Midler, E., Thomas, F., Lefebvre, M. & Engel, S. (unpublished)

Using economic experiments for agricultural policy evaluation in Lower Saxony, Germany

- ❖ **Study Region**
- ❖ **Motivation**
- ❖ **Experimental Design**
- ❖ **Results**
- ❖ **Implementation Aspects**
- ❖ **General Thoughts**

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Study Region: Lower Saxony

- ❖ **39.500 farmers**
- ❖ **Very diverse and intensive agriculture**
- ❖ **High water pollution**
- ❖ **Massive impacts on landscape heterogeneity (maize monocultures)**
- ❖ **Media attention: EU infringement proceeding reg. Nitrate Directive**

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Research Question & Motivation

"How to mainstream environmental protection into the CAP?"

❖ **Main approaches to address environmental issues: Greening & AEM**

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Research Question & Motivation

"How to mainstream environmental protection into the CAP?"

❖ **Main approaches to address environmental issues:** **Greening & AEM**

❖ **Heated policy debate:** which route to take in the next reform
  ▪ Extend Greening: increase conditionality of direct subsidies
  ▪ 'Public Goods for Public Money': phase out direct payments and rely on AEM

  <div align="right">e.g. BMUB 2017, Swinnen 2013</div>

❖ **Idea: bring arguments into this debate from a behavioral perspective**
  ▪ What policy framework results in more environmental protection?
  ▪ What are the behavioral factors that drive farmers decision-making?

Research Question & Motivation

Why a behavioral perspective?

❖ **Our hypothesis:** Farmers' willingness to protect the environment may also depend on…

- ▪ **Perceived gains/losses:** net benefit, endowment effect, loss aversion

  Kahnemann et al. 1991, Ericson & Fuster 2014

- ▪ **Framing:** being part of the solution vs. being part of the problem, media picture

  Tversky & Kahnemann 1985, Levin et al. 1998, Blasch 2015

- ▪ **Perceived Control:** control aversion, supportive vs. controlling policy

  Frey & Stutzer 2006, Bowles 2008, Rode et al. 2015

Experimental Design: Overview

- **Framed Field Experiment** with farmers in Lower Saxony and real monetary incentives   **Harrison & List 2004**
- Simple 2-staged decision experiment, administered online via SoPHIE (Software Platform for Human Interaction Experiments)
- Farmers are endowed with an amount of agricultural land and have to **decide how they want to manage it**
- Each subject plays a baseline and one treatment (policy scenario) (only one is paid)
- Level of analysis: net effects of policy scenarios
- **Survey** (socio-demographics, behavioral proxies)

Experimental Design: Baseline

"

*You are a farmer…. Have 120 hectares… **can farm them either with practice A or practice B**. B is more environmentally friendly but costs more.*

Your profit in points is calculated….

$$\pi_i = I + L^A(p + d) + L^B(p + d - c)$$

How much land do you want to farm according to practice A?....B?

L^A	**Land with A**
L^B	**Land with B**

Average LS values:

p	**Profit contrib. arable f.**
d	**Direct subsidy**
c	**Costs of B**
I	**Other Income**

Experimental Design: Baseline

"

You are a farmer…. Have 120 hectares… **can farm them either with practice A or practice B**. *B is more environmentally friendly but costs more.*

Your profit in points is calculated….

$$\pi_i = 15000 + L^A(150 + 325) + L^B(150 + 325 - 85)$$

$$\pi_i = 15000 + L^A(475) + L^B(390)$$

How much land do you want to farm according to practice A?....B?

❖ **Environmental protection is costly**
❖ **CAP in 1980s**

L^A	**Land with A**
L^B	**Land with B**

Average LS values:
150	**Profit contrib. arable f.**
325	**Direct subsidy**
85	**Costs of B**
15000	**Other Income**

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Experimental Design: Treatments

Treatment	0 No Loss 1 Loss (Comp. to BL)	0 Voluntary 1 Mandatory (Practice B)	0 Positive Frame 1 Negative Frame	Policy Scenario
1	0	0	0	AEM
2	1	0	0	AEM and modulation
3	1	1	0	Greening
4	1	1	1	Greening with neg. frame
5	0	0	1	AEM with neg. frame
6	1	0	1	AEM, modulation, neg. frame
7	0	1	0	Greening, no Loss
8	0	1	1	Greening, no Loss, neg. Frame

➢ **Not policy relevant + budget limitations**

Experimental Design: Payoff Function

T1: $\pi_i = I + L^A(p + d) + L^B(p + d - c + g)$

$\pi_i = 15000 + L^A(475) + L^B(475)$

T2: $\pi_i = I + L^A(p + b) + L^B(p + b - c + g)$

$\pi_i = 15000 + L^A(390) + L^B(390)$

T3: $\pi_i = I + L^B(p + b - c + g)$

$\pi_i = 15000 + L^{total}(390)$

$\pi_i = I + L^A(p + b) + L^B(p + b - c)$

$\pi_i = 15000 + L^A(390) + L^B(305)$

! g = c !

L^A	**Land with A**
L^B	**Land with B**
p = 150	**Net margin**
d = 325	**Direct subsidy**
c = 85	**Costs of B**
I = 15k	**Other Income**
g = 85	**Green payment**
b = 240	**Reduced subsidy**

Experimental Design: Framing

Positive Frame:

The payment is implemented because farming practice B is better for the environment than farming practice A. By engaging in farming practice B **you make a positive contribution** towards overcoming societal challenges by stabilizing the climate, and by preserving biodiversity and water quality.

Negative Frame:

The payment is implemented because farming practice A is more damaging to the environment than farming practice B. By engaging in farming practice A **you cause harm to society** by contributing to climate change, and by reducing biodiversity and water quality.

Experimental Design: Survey

Before the experiment:

❖ **Before: Loss Aversion (lottery, not incentivized)** Wang et al. 2016

After the experiment:

❖ **Socio-demographic characteristics**

❖ **Farm characteristics (crops, livestock, participation in environmental programs, direct payments)**

❖ **Likert-type preference proxies (control aversion, guilt aversion, environmental preferences, warm glow) [too keep the survey shorter, we did not use constructs like NEP, Reactance Scale, etc.]**

Experimental Design: Setup

❖ **Advertisement** in "Land & Forst" (planned, not executed in the end)

❖ **Invitation Letters** were sent to 15.000 farmers in Lower Saxony

❖ Those were **randomly selected** from all farmers in Lower Saxony that are subject to the Greening regulation

❖ **450 participants** were our target (3%) (75 per treatment)

❖ **Average payoffs**: 45€(30 minutes, above avg. income, EdenRed voucher cards)

❖ **Time window** for participation: 2 weeks, 2 h after log-in

Results

❖ **Will be presented in a special session on "Economic experiments for EU agricultural policy evaluation" at**

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'EAAE 2017, Parma, Italy'

Results: Response Rate

❖ **Experimental session needed to be terminated after 3 days (upper cap of participants was reached)**

❖ **Approx. 1200 log-ins in 2 weeks (8%) + more than 100 emails and telephone calls**

❖ **Approx. 600 farmers started the survey in the first three days; 451 completed it (25% dropout rate)**

❖ **Lessons Learned:**
- **In general farmers are motivated to participate**
- **To pay less is an option**
- **To increase duration / treatments is an option**
- **To send fewer letters is an option**
- **Next time: offer possibility to participate without payment when upper cap is reached**

Results: Response Rate

"Solche Studien, an denen nur Landwirte teilnehmen, müsste es öfter geben. Teilen Sie die Ergebnisse der Öffentlichkeit und der Politik mit.

"We need more of such studies with only farmers participating. Please communicate your results to the public and the policy makers.

Implementation Aspects

I. Convincing key partner(s)

Who do the farmers trust?

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'Landwirtschaftskammer Niedersachsen'

- ▪ Address management and invitation letters
- ▪ Payout letters
- ▪ Pre-testing
- ▪ Professional advice
- ▪ Data availability

Implementation Aspects

I. Convincing key partner(s)

❖ How to **approach the institution**? [**Our case**: convince president first]

❖ How to **communicate your research** to the institution?

  ▪ If topic is sensible: emphasize **neutral position**
  ▪ **Avoid controversial terms** from the political debate ("conventional" vs. "green farming")
  ▪ **Be transparent** regarding source of funding, hypothesis, etc.
  ▪ **Be open** towards their needs / requirements / opinion

❖ Who is / are **contact person(s)**: status inside the institution, do they understand scientific needs? [**Our case**: several high and lower level persons, partly with PhD degree]

Implementation Aspects

II. Recruitment

❖ **Postal letters** with codes to access the experiment online

How to recruit
farmers as
participants in
economic
experiments ?

Implementation Aspects

III. Logistics & Data Privacy

❖ **Data privacy** was a serious concern for the chamber (esp. to be able to defend chamber activities when confronted by the ministry)

❖ In general chamber is allowed to provide data, when it is **anonymized**

❖ We found a **workaround for the address data** (trusted printing shop)

❖ Further logistics aspects:
- Communication with chamber **takes time**
- **Advertisement** in Chamber magazine
- Mail to **inform local offices** about the study
- Mail to **inform consultants** about the study

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Implementation Aspects

IV. Chamber Feedback

❖ **Timing:** not during harvesting, sowing or CAP applications period

❖ **Topic is sensible** for farmers: avoid words associated with green / ecological / organic farming

❖ Use **farmers' vocabulary**

❖ **Letter appearance** matters a lot: motivate farmers to voice their opinion

❖ **Do not simplify** farming activities too much (payoff function, setting, etc.)

Implementation Aspects

"*Ich habe noch nie bei so einer blöden Studie teilgenommen. […] Landwirtschaft gibt keine Punkte und es gibt auch nicht mehr Punkte für schöner wirtschaften! Landwirtschaft ist auch kein Spiel, sondern wir ernähren die Bevölkerung mit bewusstem Einsatz von PS und Dünger. […]*

"*I never participated in such a stupid study. […] Agriculture is not about earning points and we do not earn more points for a nicer business. Also agriculture is not a game, but we feed the people with a mindful use of pesticides and fertilizer. […]*

Implementation Aspects

V. Pretest Feedback

❖ **Do not simplify** farming activities too much (payoff function, setting, etc.)

❖ **Letter appearance** matters a lot

❖ **Add questions** where they can state more general points

❖ The issue of actual payoffs – **questioning the incentive effect?**

"Why do you pay? Do you want to influence our answers?"

"I was not at all motivated by the money we received!"

Implementation Aspects

" *[…] Ich habe versucht die Fragen nach gutem Wissen und Gewissen zu beantworten. Entscheidungen wurden eher spontan getroffen, ähnlich wie es im eigenen Betrieb läuft.*

" *[…] I tried to answer the questions to the best of one's knowledge and belief. The decisions were made rather spontaneous, similar to those regarding my real farm.*

Implementation Aspects

" *Ich habe den Sinn und Zweck dieser Studie absolut nicht verstanden. […]*

" *I did not get the purpose of this study at all. […]*

Implementation Aspects

" *Was ist das für eine Frage, wie schuldig sie sich fühlen, wenn sie umweltschädliche Praktiken einsetzen? Da wollte ich glatt den Computer gegen die Wand schmeißen. […]*

" *What kind of question is that 'how guilty do you feel when you use environmentally damaging agricultural practices?' I was about to throw my computer against the wall […]*

General Thoughts

Building up a subject pool

❖ Coordinate work with implementation partner (minimize their effort)

❖ Share results with implementation partner and with the farmers

❖ Answer questions and phone calls from the farmers

❖ Take farmers' opinions serious

General Thoughts

Added complexity of player interaction

❖ **Research issues that involve player interaction complicate experimental setup**

❖ **Farm apprentices as proxy for 'real' farmers**

❖ **Study in Brazil found no difference between behavior of farmers and farm apprentices**

Reutemann et al. 2016

General Thoughts

Abstract vs. context-specific experiments

❖ **Examples of more context-specific experiments conducted in our group:**

    ❖ **Use of peatlands in Switzerland (Thesis of Marie Ferré)**

    ❖ **Payments to avoid deforestation in Brazil**

                        Reutemann et al. 2016

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Abstract vs. context-specific experiments

Pro

- **Learning** about important problem characteristics during game design

- Photo realistic computer graphics & realistic parameters create **strong framing** → external validity ↑

- Realistic parameters and incorporation of real world complexities (constraints, uncertainty, ecology) → **usefulness for policy design** ↑

- Potential for linking experiments to more **complex ecological models**

- Potential **learning effects for participants**

Contra

- Difficult to trace **underlying drivers** of behavior, their relative importance and interactions

- Some **weaknesses of experiments** remain (size of stakes, potential experimenter effects, time preferences difficult to include)

- **Cognitive ability** to grasp complex situations in short experiment may be questioned

- **Computer literacy** required

- Some **artefacts of visualization** (for ex.: # of cells in a row)

The End.

> *Wenn ich mich als Landwirt nicht mehr über die Vielfalt der Natur auf meinen Flächen freuen kann, sondern Angst vor weiteren Sanktionen und Auflagen habe, dann gibt es nur Verlierer.*

> *If I cannot be happy anymore, about the diversity of nature on my land, but have to worry all the time, about more sanctions and requirements, there will only be losers.*