Environmental impacts of the CAP ‘Greening’ obligations

A counterfactual exercise in the Spanish context

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Good Practice Workshop on the 'Assessment of Environmental Impacts of the CAP
June 12th and 13th, 2025

Three mandatory practices, to contribute to the EU's environmental and climate goals:

- **Crop Diversification (CD)**
  to enhance the resilience of soil and ecosystems
- Permanent Grassland (PG)
  to support carbon sequestration and protect habitats
- Ecological Focus Areas (EFA)
  to aid biodiversity

«Greening» (Reg EU No 1307/2013) for a greener Union

Over the 2014 programming period, ≈30% of direct payments to farmers were earmarked as '**Greening payments**'

- without altering the overall budget
- granted **at the farm-level**
- *exceptions for farmers under special circumstances* (organic; small-farmer scheme; specific exemptions)
- 2014 – 2022 CAP programming period

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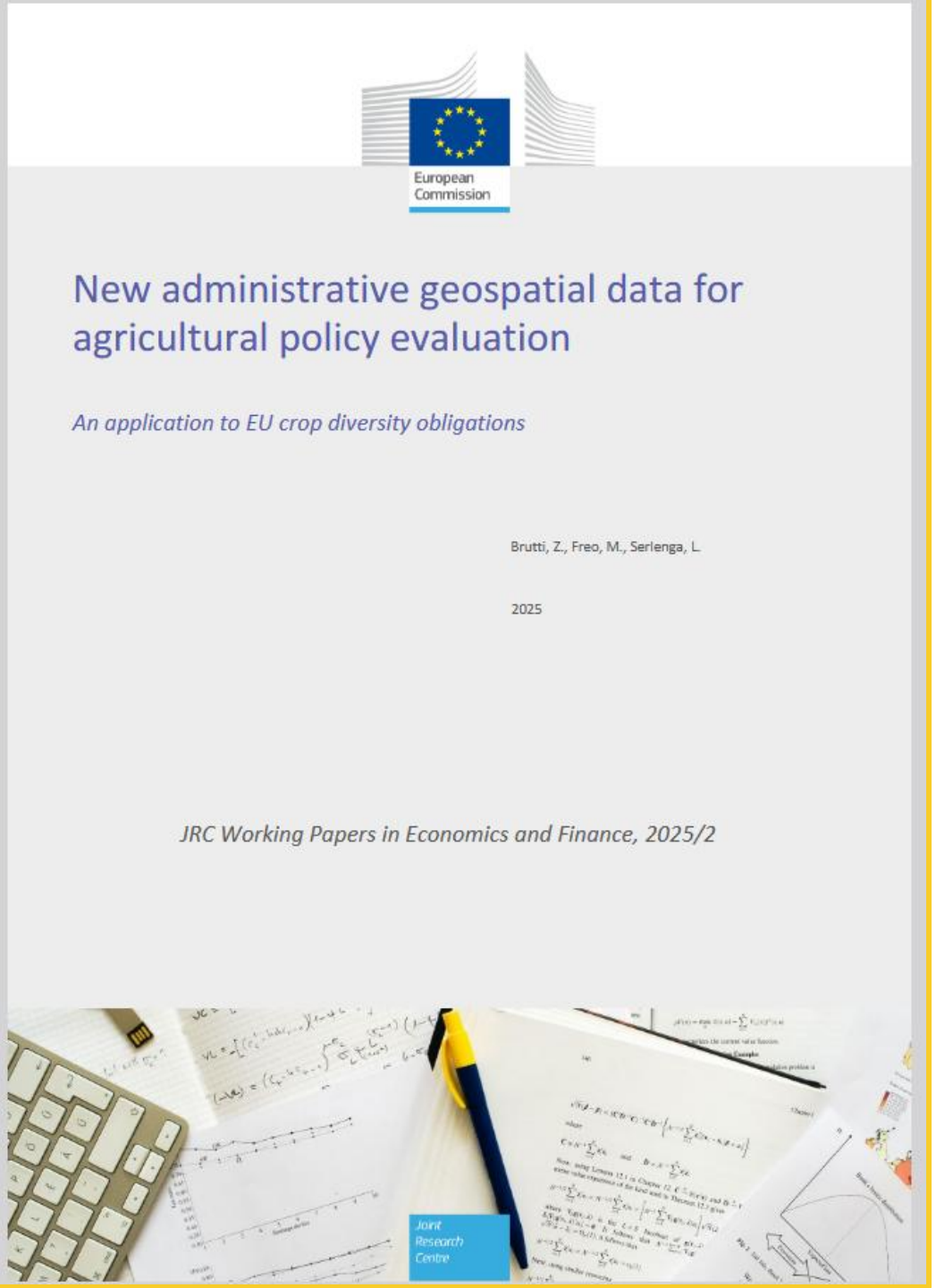

Today's presentation

- Application of counterfactual methodologies
  - Discontinuity design
- Use of highly detailed, administrative big data from the IACS system for evaluation purposes
  - Universal coverage of CAP applicants (big data)
  - Free (already produced)
  - More precise than survey data

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Data

GeoSpatial Aid Applications (GSAA)

"Geospatial aid application as part of the Aid applications subsystem of IACS, defined by Art. 68 of Regulation 1306/2013." *(IACS = Integrated Administration and Control System)*

"Delineation of agricultural parcels with cultivated crop or crop groups as submitted by the farmer in a given year"

- Self-declared by farmers (Feb-May)
- Base for receiving subsidies

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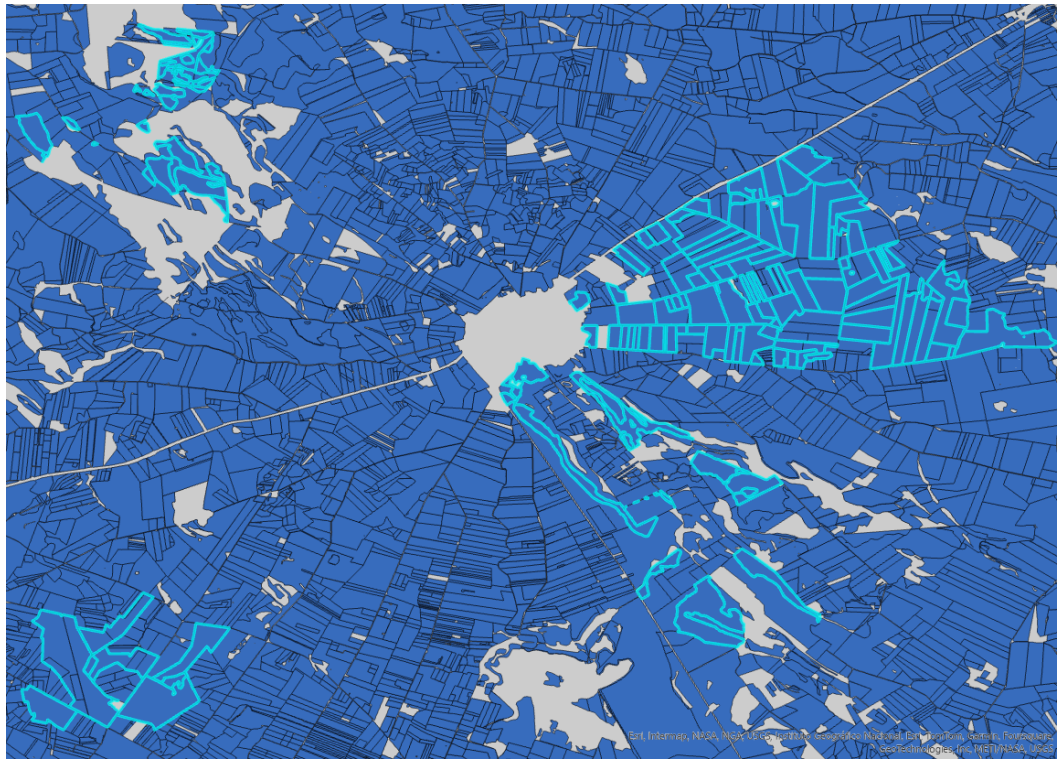
Spanish parcel-level data ⇒ aggregate into holdings



Number of holdings	**643,049**	
Median size of UAA	7.2	ha
Average size of UAA	44.8	ha
Number of holdings with AL	**324,762**	
Median size of AL	6.9	ha
Average size of AL	37.2	ha

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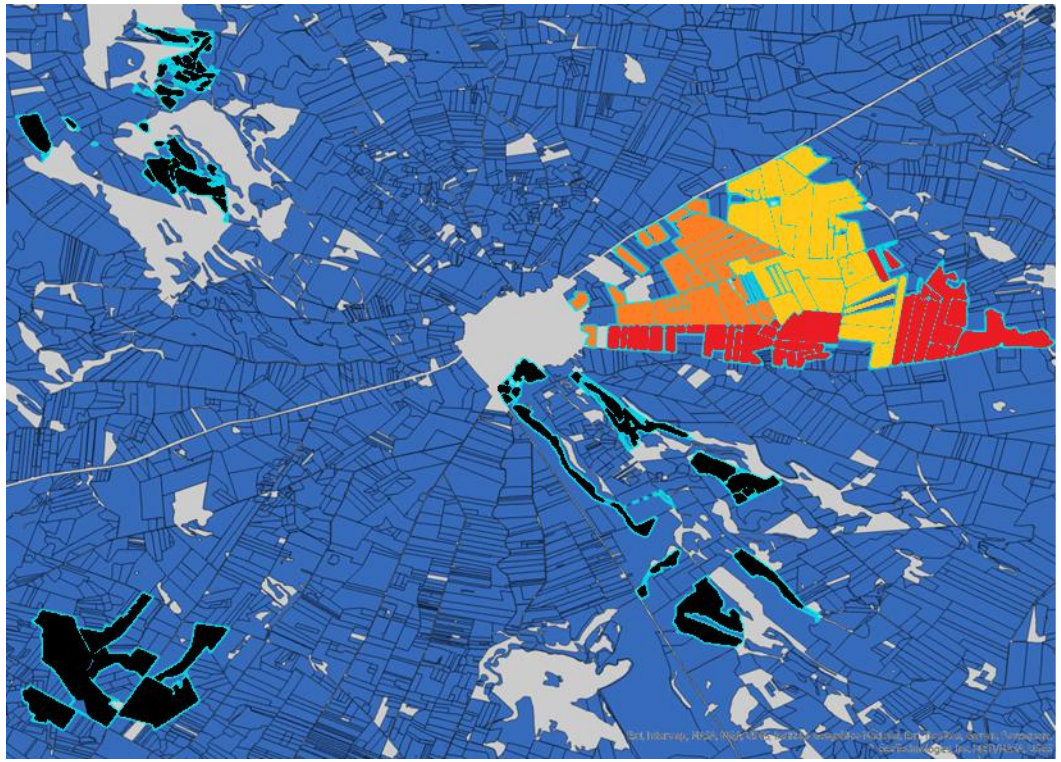

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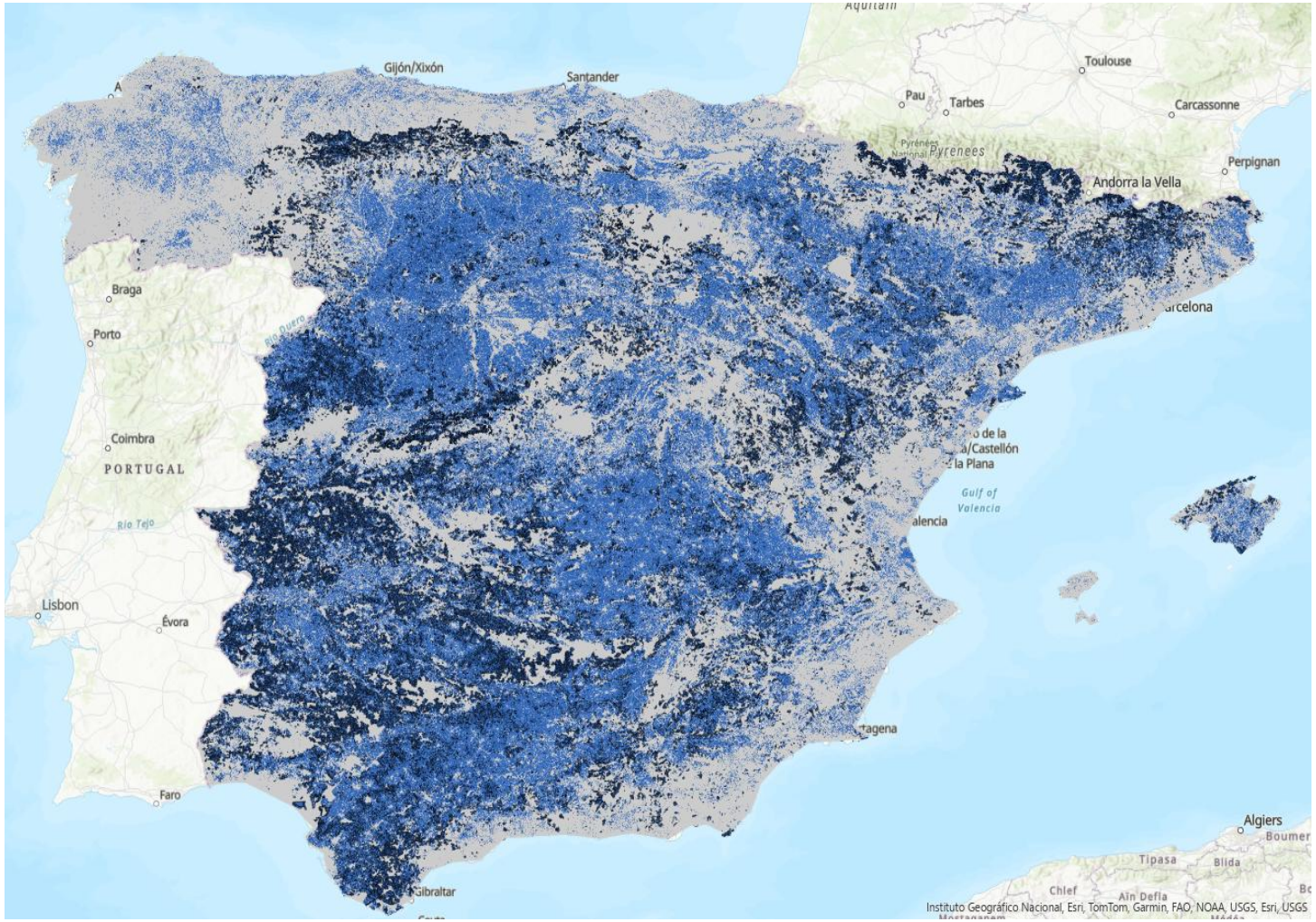
Universal coverage of CAP applicants **for the year 2022**



- Exact geo-location
- Exact size
- Exact use given to each parcel
  - product grown
  - fallow land
  - permanent grassland
  - ...

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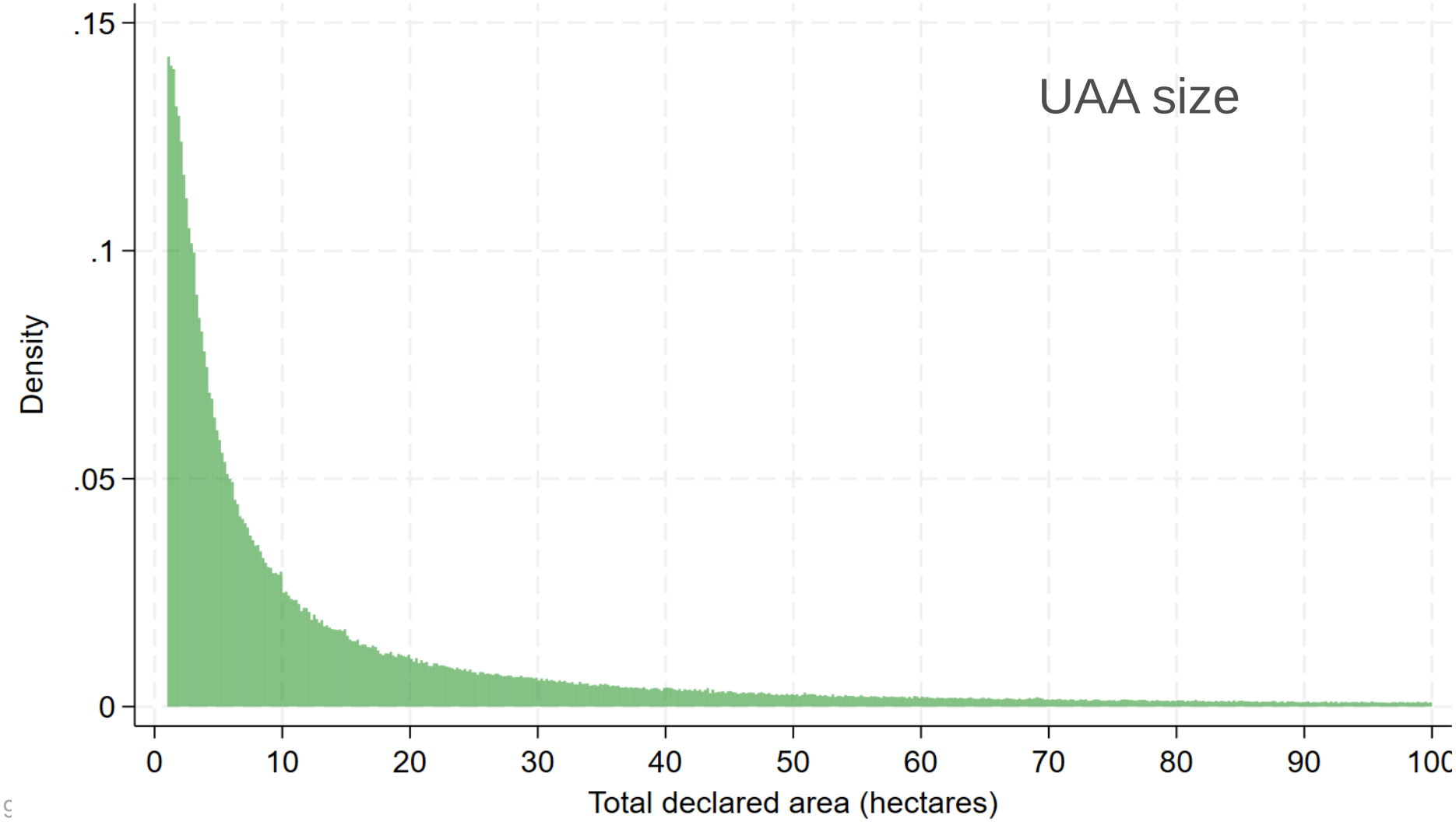
Work with full distribution of farm-level characteristics (all CAP applicants)



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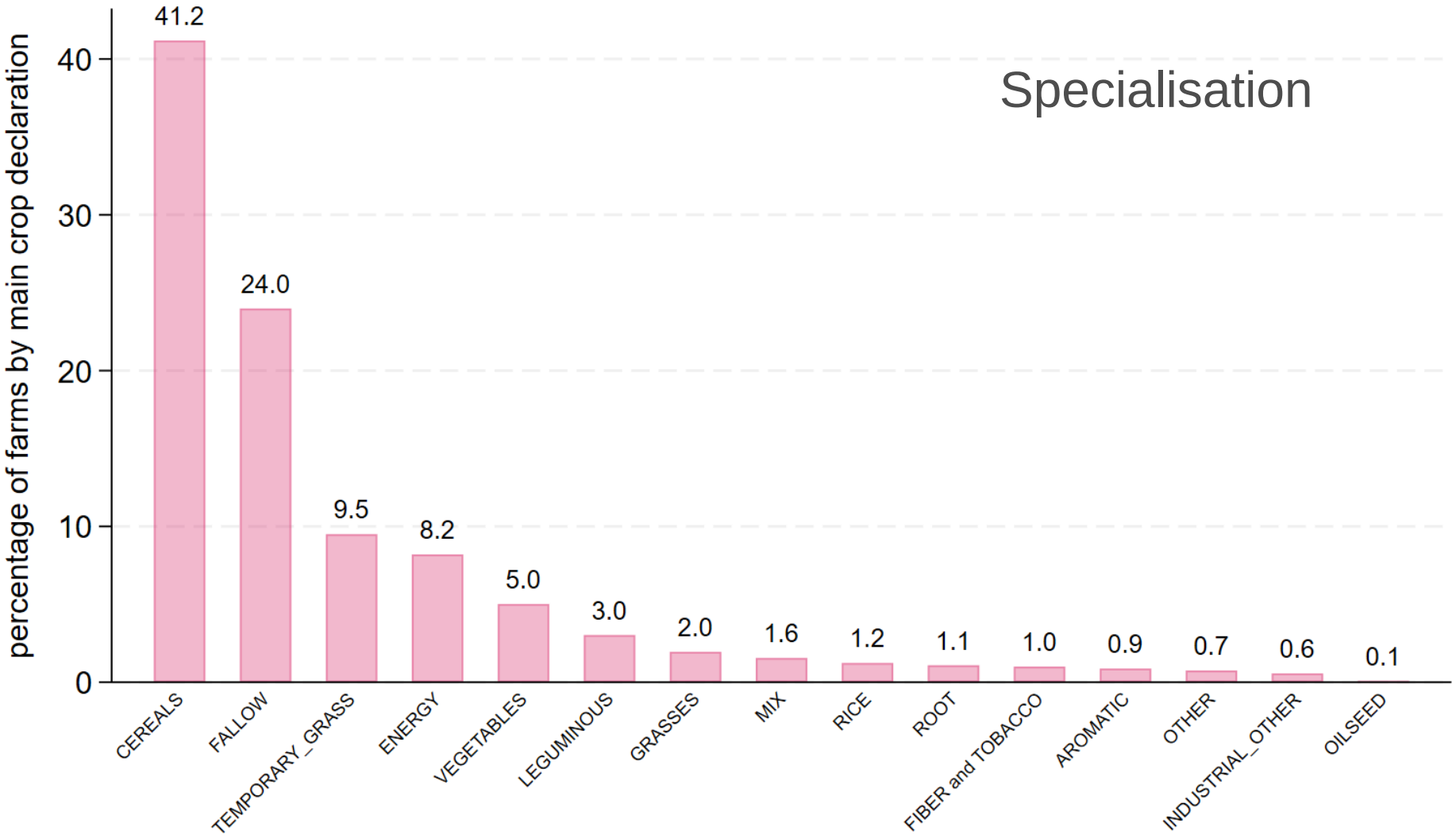

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Methodology

How was the policy (= 'the treatment') assigned?

Crop diversification (CD)

Arable land size	Requirement
< 10 ha	-none-
10 ≤ ha < 30	**2 crops** (main c. ≤75%)
≥ 30 ha	**3 crops** (main c. ≤75%; first 2 c. ≤95%)

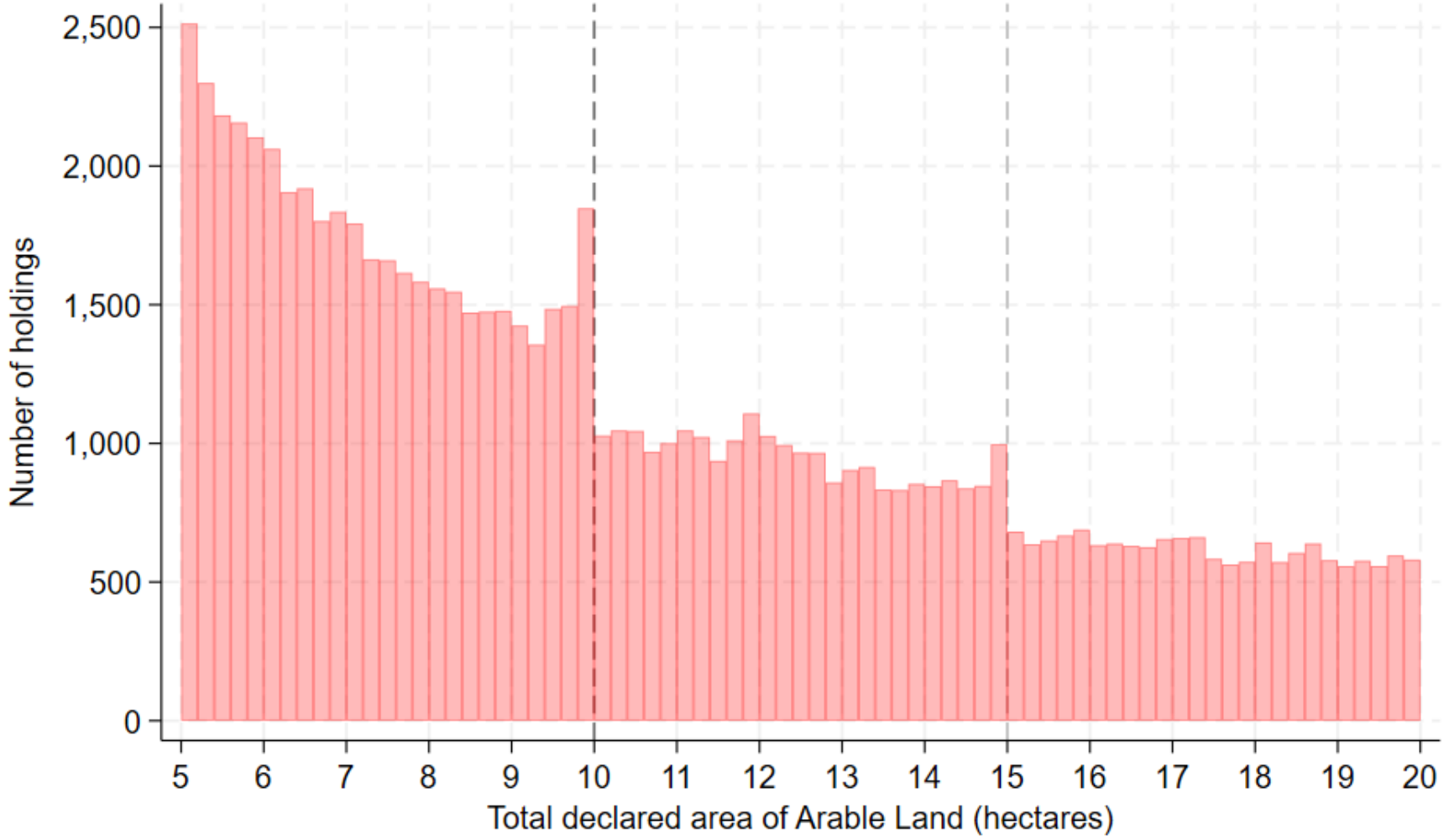
«If your AL size exceeds 10 ha, you have to grow at least 2 crops on it.»

«... and if it exceeds 30 ha, you have to grow at least 3 crops on it.»

*This is a **THRESHOLD-based** policy / obligation.*

*The threshold that triggers the obligation is set on the **AL size**.*

Zoom in at the Greening policy thresholds



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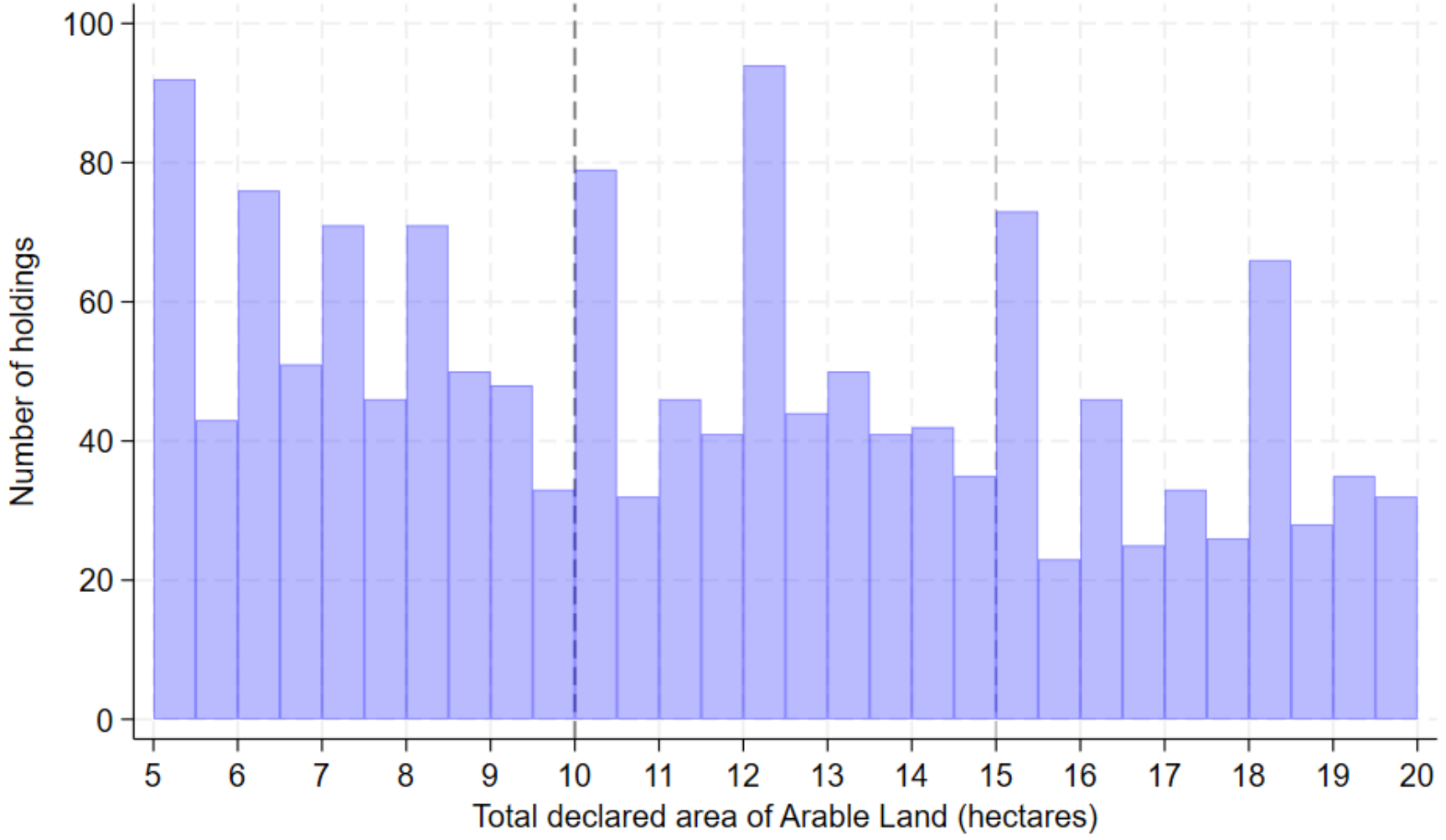
(in FADN you do not see this)



FADN survey

(80,000 farms/year)

- Rounding in reporting
- Selection of larger farms
- Overall noisy

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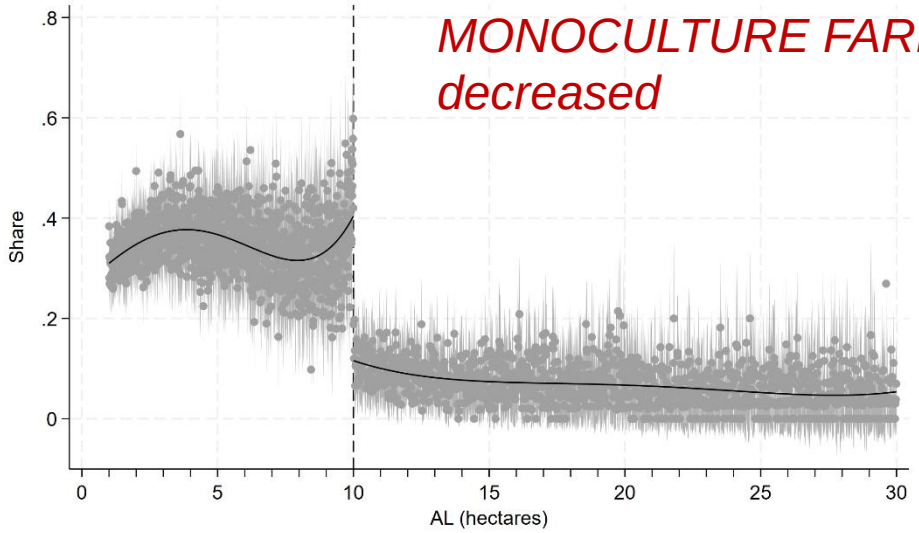
Features of the threshold design

- The estimated policy impact is **valid for the subgroup of farms** that are **close to the policy threshold** (10 ha of AL)
  - LOCAL Average Treatment Effect

+ Only need **one cross-section of data** (no panel needed)
  + Can perform RD on a year before the policy, as a placebo

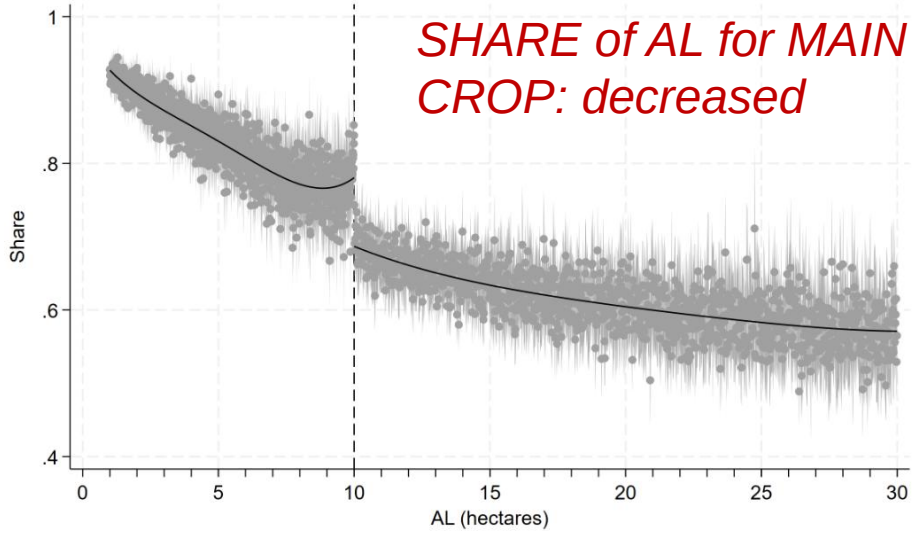
Results 1st stage

High-precision results

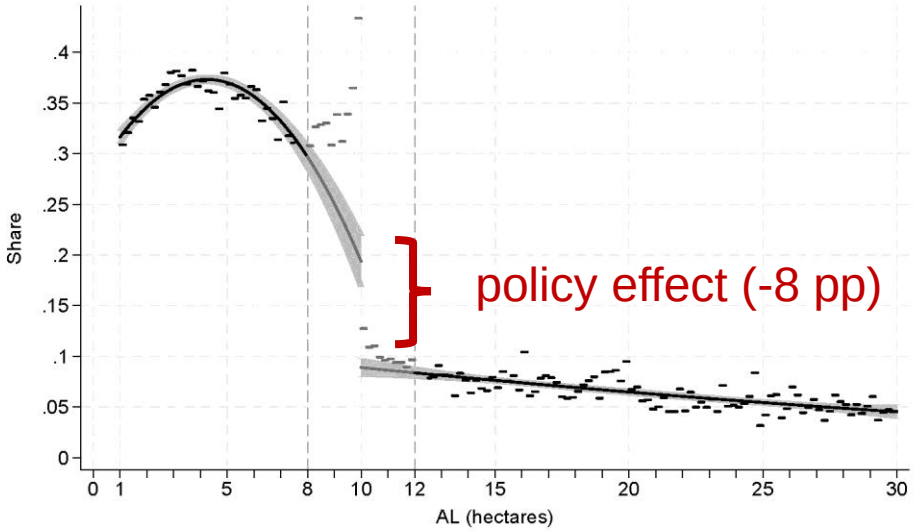


MONOCULTURE FARMS: decreased

<- *Raw data* ->

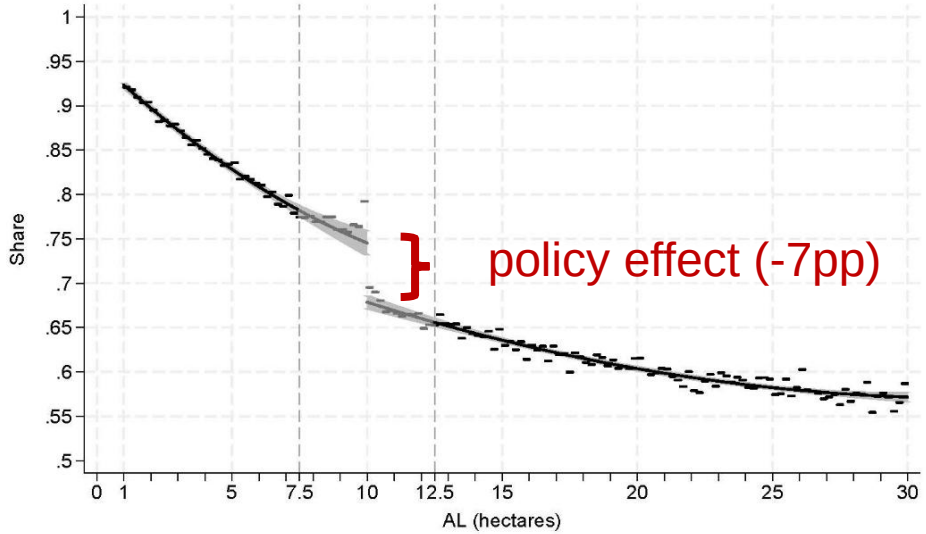


SHARE of AL for MAIN CROP: decreased



policy effect (-8 pp)

<- *Modelled versions* ->



policy effect (-7pp)

First stage conclusions

- Found sizeable impacts on policy implementation outcomes:
  - *Share of farms having at least 2 crops (and 1st crop <75%)*
  - *Number of crops grown*
  - *Share of land dedicated to first crop*

- Are these effects large / small / worth the money? *(Discussion)*

Results 2nd stage

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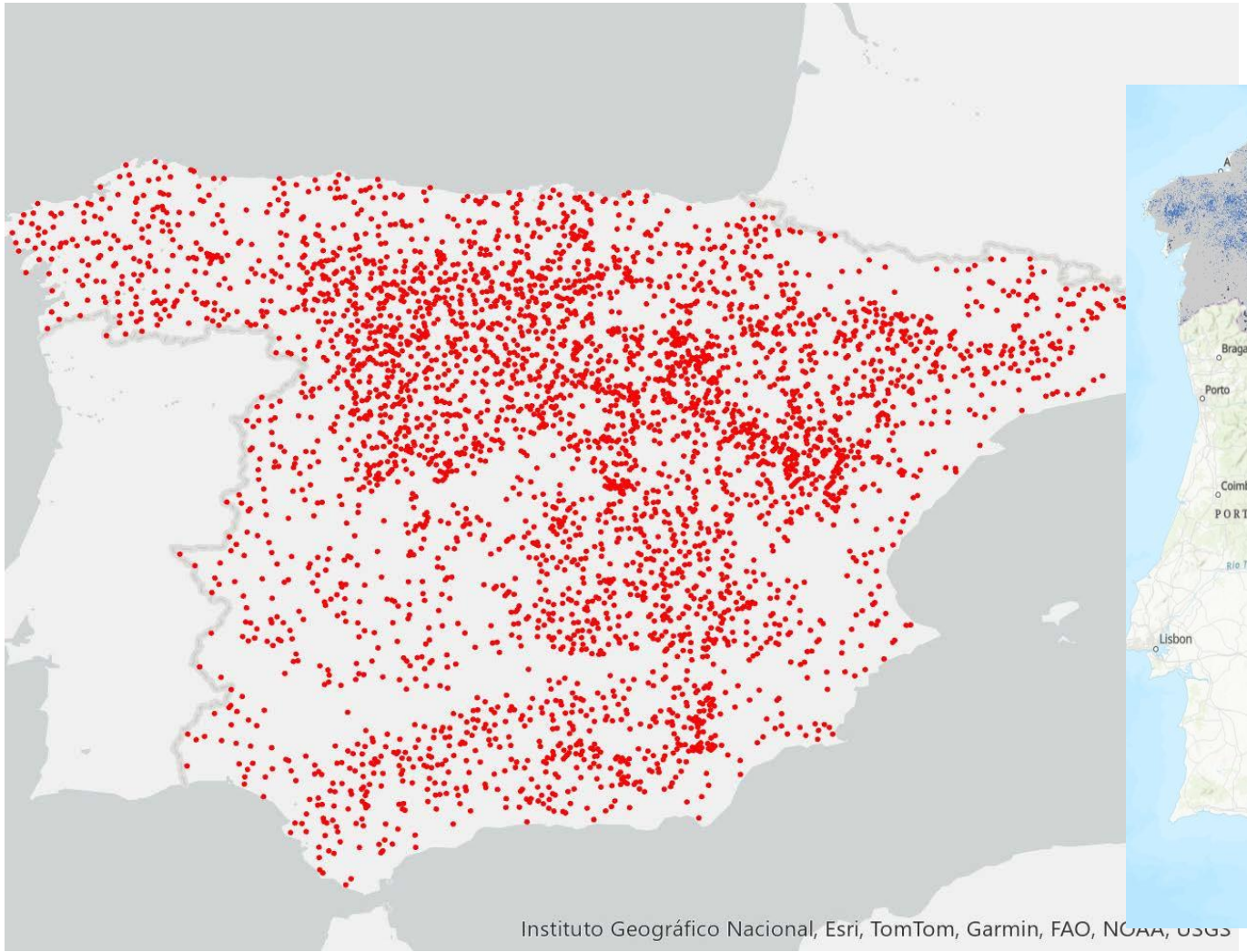
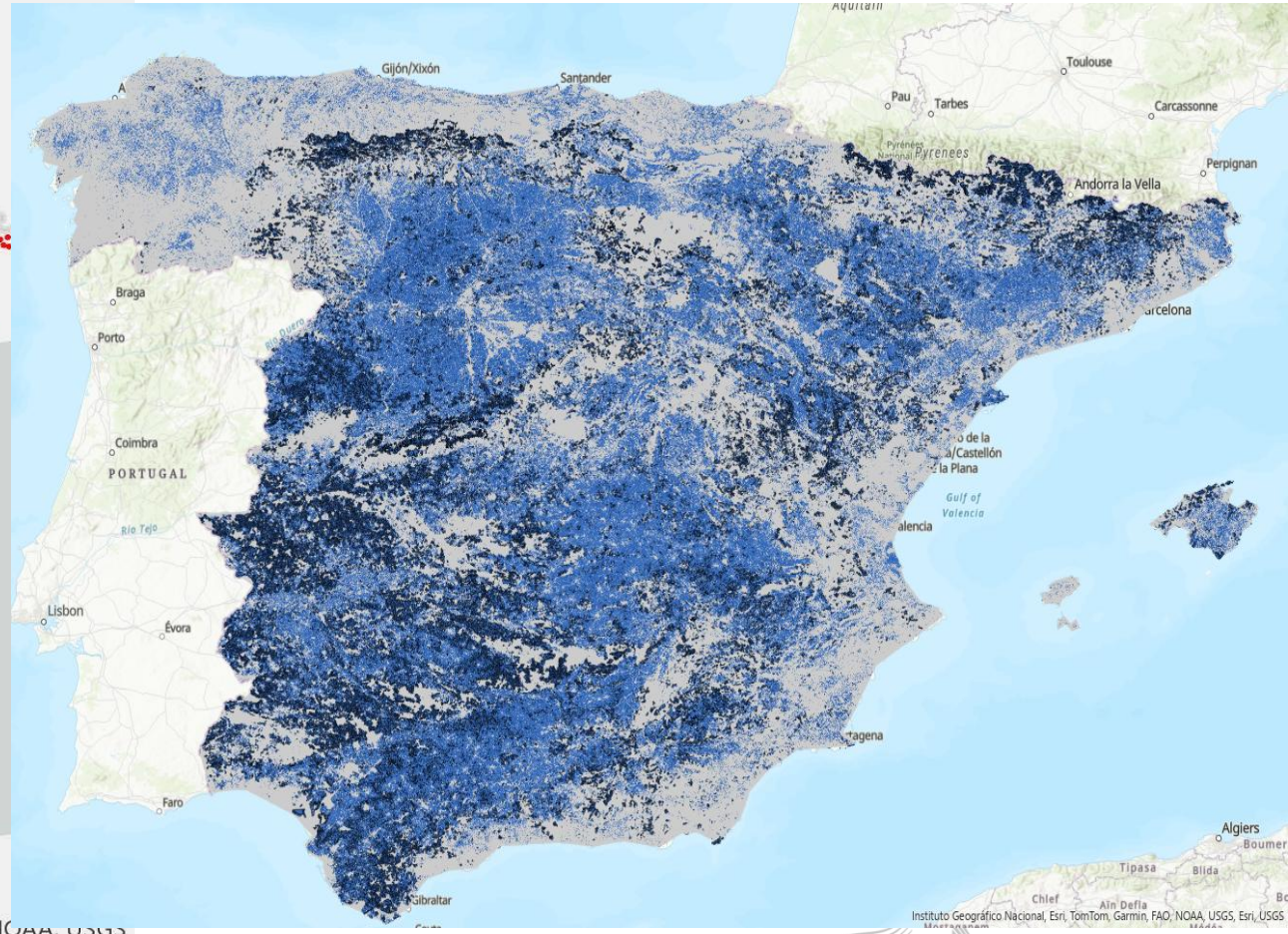
Soil quality (LUCAS 2018) + parcel data (2022)





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What we measure the impact on

- **Soil Organic Carbon (SOC)** content as the outcome of interest
- Good indicator for soil quality
- *Sensitive to farm practices*

Big challenge encountered for our threshold-strategy:

not enough LUCAS points fall on holdings farming approximately 10 (or 30) hectares of AL

Wishlist

- Access to administrative data!
  - GSAA **with (anonimised) holding identifiers** has proven key in this analysis. It is not easy to get hold of.
- More **environmental outcome data** collected in *strategic points*
  - **where it enables policy impact evaluation**
  - i.e. plan data collection in coordination other datasets and policy goals
- …

Thank you

EU Science Hub
joint-research-centre.ec.europa.eu

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