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Forced Sales and Farmland Prices

Martin Odening, Simon Jetzinger

Farm Management Group

Department of Agricultural Economics, Humboldt Universität zu Berlin, Germany
Invalidenstrasse 110, D-10115 Berlin

Silke Huettel*

Quantitative Agricultural Economics

Department of Agricultural Economics, Humboldt Universität zu Berlin, Germany
Invalidenstrasse 42, D-10115 Berlin

*Corresponding author:

E-mail: silke.huettel@agrار.hu-berlin.de

Tel +49 (0)30 2093 6459

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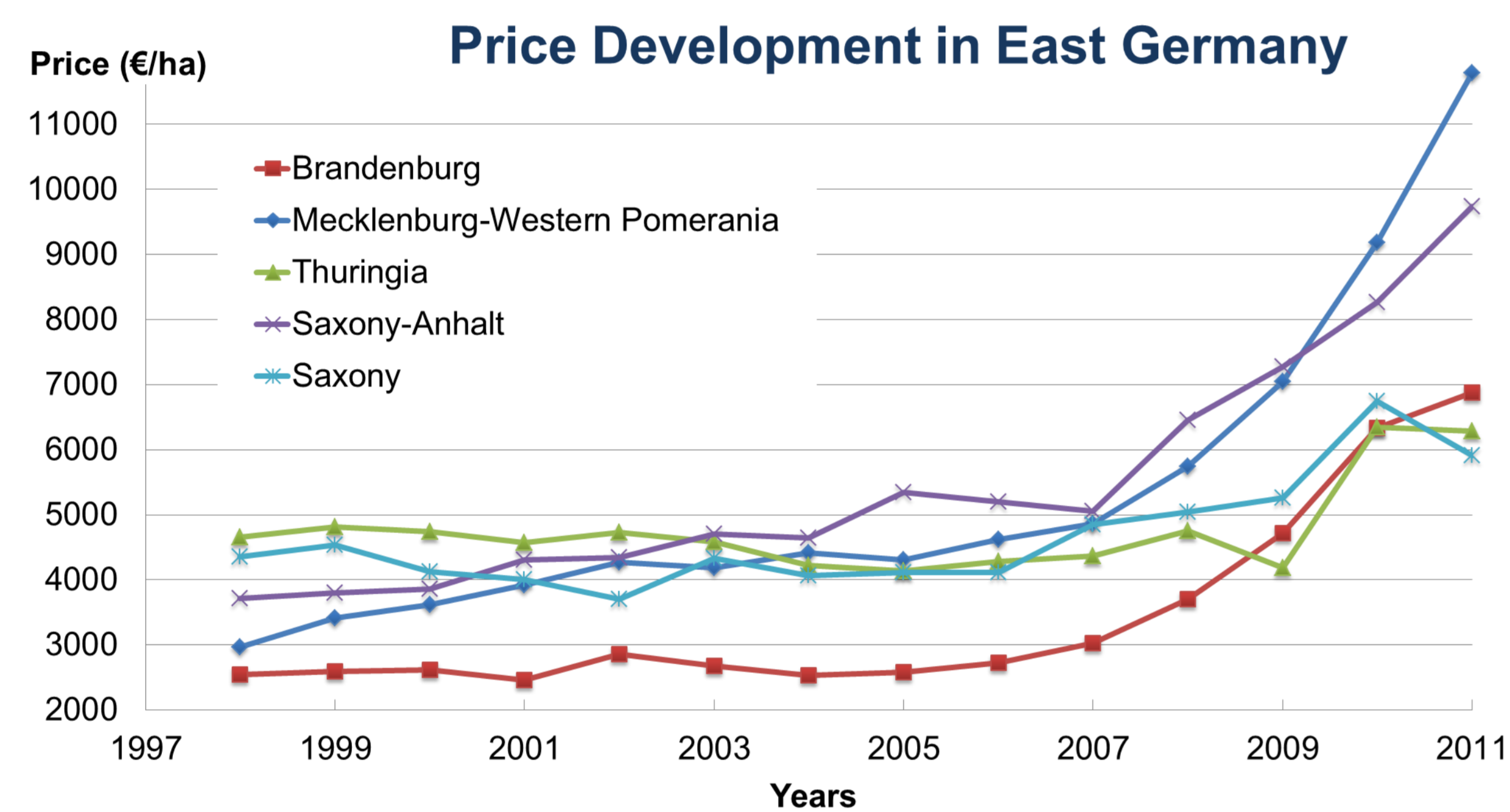
MOTIVATION

Loan value for agricultural land

- Common practice price discount
Limit: 60 % < loan value: 80 % < market value: 100 %
- Need: value independent of market fluctuations

Forced sales in Germany

- First-price auction
- Sale under time pressure
- Public tender: local land market



LITERATURE

Price Determinants

- Procedure: hedonic price model
- Plot characteristics e.g. soil quality
- Local characteristics e.g. precipitation

Price effect of forced sales?

- Pressured sale: price ↓
less pronounced in market booms
- First-price auction effect: price ↑
- Public tenders: attracts potential bidders: price ↑ / ↓

➔ **Net effect?**

OBJECTIVE

Quantify the net average price effect of a forced sale

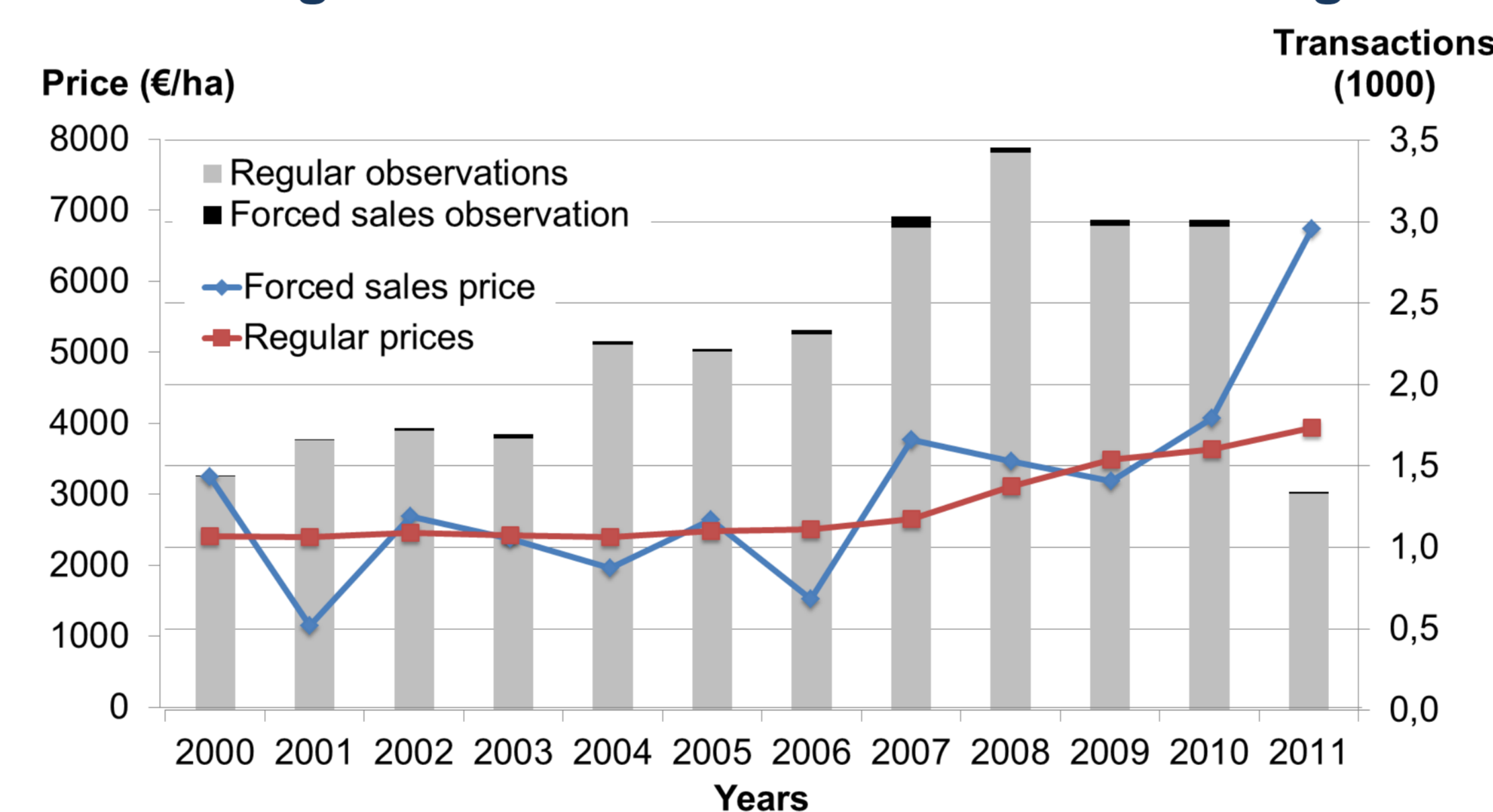
DATA

- Source: "Oberer Gutachterausschuss im Land Brandenburg"
- Observations: 19,234 'regular' (n⁰), 211 forced sales (n¹)
- 35.6 % of overall sold farmland Jan/2000 – Sept/2011
- Variables x: price, soil quality index, plot size, administrative district, date of sale



	Mean price (€/ha)	Mean soil quality [1,102]	Mean plot size (ha)
n ⁰	2,986	32	5
n ¹	3,370	33	4

Regular and forced sales in Brandenburg



METHODOLOGY

Average treatment effect of the treated ATET

- Average price discount / increase of plot *i* sold within a foreclosure
- Need: hypothetical price of a forced sale plot sold under 'regular' conditions
- Problem: lot sold either regular or as forced sale

MEASURING THE TREATMENT EFFECT

Rubin Causal Model

- Indicator: $d_i = \begin{cases} 1 & \text{if forced sale} \\ 0 & \text{otherwise} \end{cases}$
- Observed price: $p_i = d_i \cdot p_i^1 + (1 - d_i) \cdot p_i^0$
- $ATET = E[p_i^1 - p_i^0 | d_i = 1]$

Estimation

- Unconfoundedness: $p_i^0 \perp d_i | \mathbf{x} \rightarrow E[p_i^0 | d_i = 1] = E[p_i^0 | d_i = 0]$

$$ATET = \frac{1}{n^1} \sum_{i=1}^{n^1} (p_i^1 - E[p_i^0 | d_i = 1])$$

- Use n⁰: estimate E[·]

Regression $ATET_{reg}$

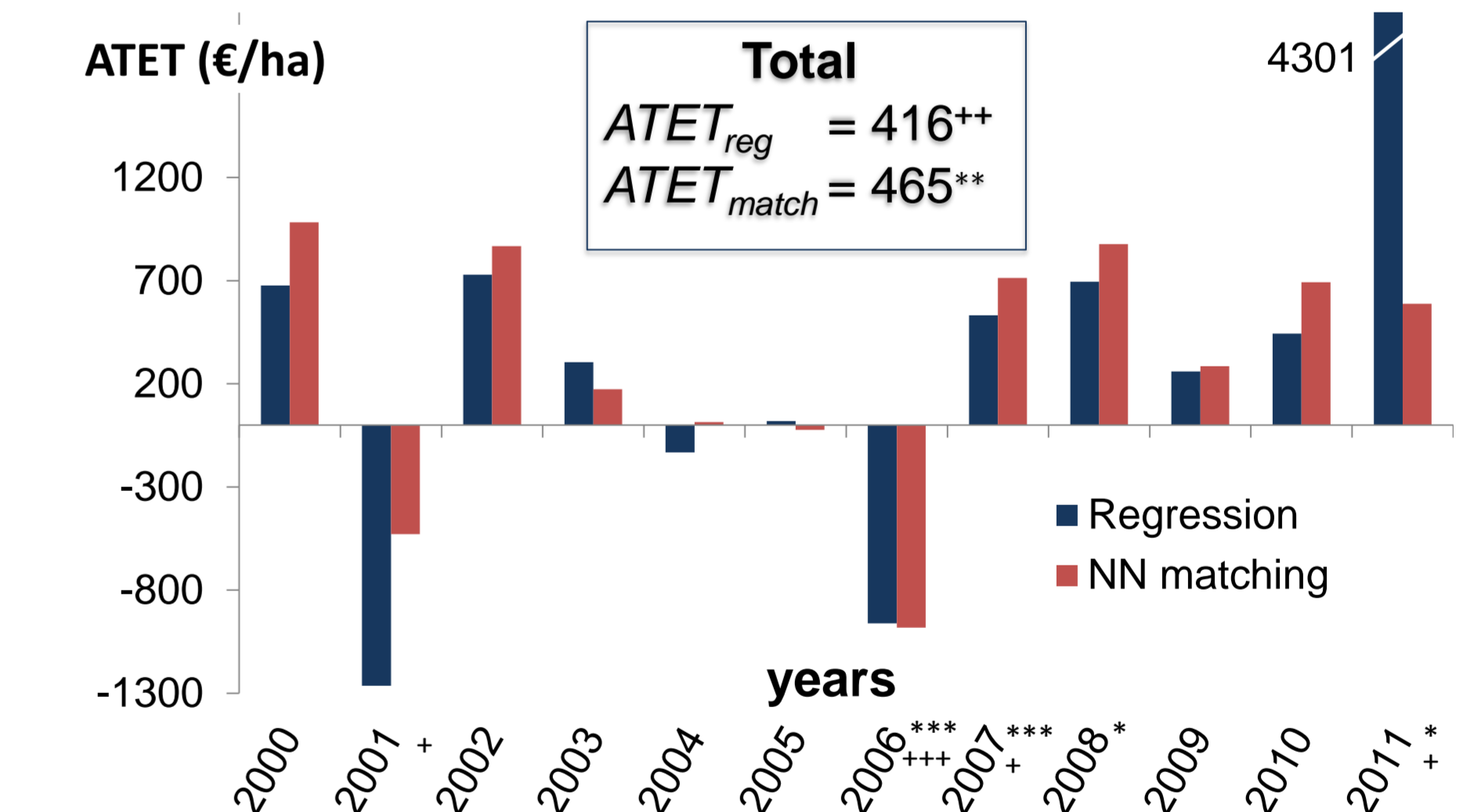
- Use n⁰ for $p_j^0 = \mathbf{x}_j^0 \beta^0 + error_j$

$$E[p_i^0 | d_i = 1]_{reg} = \frac{1}{n^1} \sum_{i=1}^{n^1} \mathbf{x}_i^1 \hat{\beta}^0$$

Nearest Neighbor Matching $ATET_{match}$

- Use 3 most similar n⁰ based on Mahalanobis distance M_{ij}
- $E[p_i^0 | d_i = 1]_{match} = \sum_{j=1}^3 \frac{1}{3} \cdot p_j^0$ with $j \in \min |M_{ij}|$

RESULTS



NN-Matching: Abadie-Imbens standard errors; ***, * denote significance at the 1 and 10% level, respectively. Regression: +++, ++ and + denote significance at the 1, 5 and 10% level, respectively.

CONCLUSIONS

- Overall positive price effect of a forced sales procedure
- Dominating first price auction effect
- Current market situation relevant
- Price discount on the safe side