Forced Sales and Farmland Prices

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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

DATA
Source: “Oober Gutachterausschuss im Land Brandenburg”
Observations: 19,234 ‘regular’ (n₀), 211 forced sales (n₁)
35.6 % of overall sold farmland
Variables: price, soil quality index, plot size, administrative district, date of sale

Mean price (€/ha) | Mean soil quality | Mean plot size (ha)
---|---|---
n₀ = 2,986 | 32 | 5
n₁ = 3,370 | 33 | 4

OBJECTIVE
Quantify the net average price effect of a forced sale

METHODOLOGY
Average treatment effect of the treated ATET
• Average price discount / increase of plot / 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

RESULTS

MEASURING THE TREATMENT EFFECT
Rubin Causal Model
• Indicator: \( d_i = \begin{cases} 1 & \text{if forced sale} \\ 0 & \text{otherwise} \end{cases} \)
• Observed price: \( p_i = d_i \cdot p_i^f + (1 - d_i) \cdot p_i \)
• \( ATET = E[p_i^f | d_i = 1] - E[p_i | d_i = 0] \)

Estimation
• Unconfoundedness: \( p_i^f \perp d_i | x \rightarrow E[p_i^f | d_i = 1] = E[p_i | d_i = 0] \)
• Use n²: estimate \( E[p_i^f | d_i = 1] \)
Regression \( ATET_{\text{reg}} \)
• Use n² for \( p_i^f = x_i^0 \beta^0 + \text{error} \)
• \( E[p_i^f | d_i = 1]_{\text{reg}} = \frac{1}{n} \sum_{i=1}^{n} x_i^0 \beta^0 \)

Nearest Neighbor Matching \( ATET_{\text{match}} \)
• Use 3 most similar \( n^0 \) based on Mahalanobis distance \( M_{ij} \)
• \( E[p_i^f | d_i = 1]_{\text{match}} = \frac{1}{n^0} \sum_{i=1}^{n^0} \frac{p_i^f - \beta | \gamma \rightarrow \text{match} \rightarrow p_i }{ \gamma } \) with \( \gamma \in \min |M_{ij}| \)

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

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