

Neighborhood effects and the exit decision

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REP 475
Applications of Geographical Information Systems



Overview

- Introduction: Why do farmers exit?
- Maine's Dairy Farms (spatial perspective)
- Modeling
- Variable Selection and Creation!
- Empirical Results and Interpretation
- Spatial Correlation of Residuals?

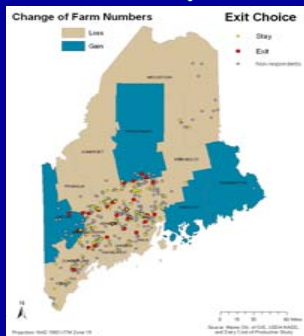
Why do farmers choose to exit?

- Retirement
- Loss of competitive advantage
- Inability to generate profit
- Urban growth pressure

What is missing?

- Spatial geography and localized economic effects (Foltz 2004; Zhang, Fang and Cai 2002)

Maine's Dairy Farms (spatial perspective)



•Dairy Belt

•Potential clustering of exit decisions

Research Objective:

•How influential is your neighbor's decision?

•Change of Farm Numbers*

Modeling

$E_i = 1$ if producer plans to exit dairying within the next five years.

Model 1:

$$E_i = f(\text{farm}_{ij})$$

Model 2:

$$E_i = f(\text{farm}_{ij}, \text{economic}_{ij})$$

Model 3:

$$E_i = f(\text{farm}_{ij}, \text{economic}_{ij}, \text{neighborhood}_{ij})$$

$$\text{Reaction function: } y_i = R(y_{-i}, x_{ij})$$

Variable Selection and Creation

Demographic characteristics:

Age, off-farm income, specialization, and short-run profitability

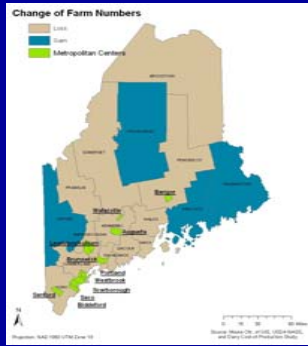
Economic geography:

Mil rate, median income, unemployment rate, housing development, and farm numbers

Spatial characteristics:

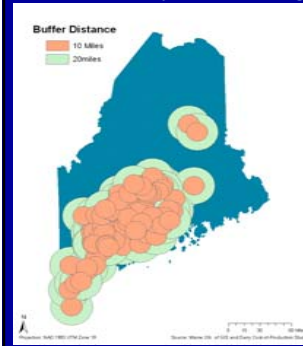
Distance to metro-center and neighborhood characteristics

Distance Measure



- What does this variable measure?
 - Opportunity cost
 - People pressure
- Creation of Metropolitan Center
- Spatial Join Technique

Dairy Farm Neighborhood



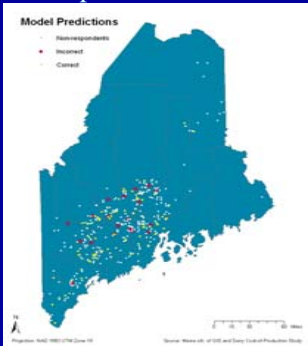
- What does this variable capture?
 - Influence of a neighbor's decision to exit on your decision to exit.
- How is the neighborhood defined?*
- Buffer Technique

Reaction function:
 $y_i = R(y_{i-1}, x_{ij})$

Empirical Results and Interpretation

| | Farm-level effects | Economic effects | Neighborhood effects |
|-------------------------------|--------------------|------------------|---|
| Demographic characteristics: | Age | Age | Age |
| Economic geography: | - | Median income | Median Income |
| Neighborhood characteristics: | - | - | Number of exiting farms in ten and twenty mile buffer |

Spatial Correlation of Residuals?



- How well does the model perform?
- Is there spatial correlation of the residuals?

Questions or Comments?

Thank you to the Maine Milk Commission, Dr. Dalton, Dr. Bell, and my office mates