Vehicle Markets in Maine: A Preliminary Spatial Analysis

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Overview
- Background and Motivation of Thesis
- Point Pattern/Cluster Analysis
- Literature Review
- Objective and Hypothesis
- Methods
- Modeling
- Results
- Policy Implications and Conclusions
- Future Research

Background and Thesis Motivation
- Eco-Information program as a means of addressing Air Quality problems in Maine
- What Problems?: eight counties are non-attainment areas

Point Pattern/Cluster Analysis

Vehicle Purchase Location and Literature Review
- Explanation for Clusters:
  - Distance (proxy) leads to different prices depending on location to market (Goodwin & Piggott 2001)
  - Consumers have preferences for producer location (Blair 1995)

Data
- Survey implemented in summer 2004
- 1,148 registered Maine vehicle owners
- 60% response rate

Survey Respondents
- Source: Maine Office of GIS and REP survey
- Projection: UTM, Zone 19, North American Datum 1983

Pollution by Vehicle Type
- Source: Maine Office of GIS and REP survey
- Projection: UTM, Zone 19, North American Datum 1983

Vehicle Purchase Location
- Source: Maine Office of GIS and REP survey
- Projection: North American Datum 1983
Objectives and Hypothesis

Objective: To determine if spatial proximity to competing vehicle markets is a significant factor in the vehicle choice decision of Maine consumers.

Hypothesis: The distance between respondent’s location and closest out of state market, as well as individual characteristics, will significantly impact their decision to purchase a vehicle in state.

Methods

- Created centroids of Zip Codes (VB)
- Created layer of crossing towns
- Spatial Join: Calculation of distance between centroid and closest cross town

Modeling

Theoretical Modeling:
- \( T_i = k \left( \frac{N_i}{N_j} \right) D_{ij}^{\alpha} \)
- Transactions between cities = \( f(nc(population \ ratio, \ distance)) \)

Empirical Modeling:
- Purchase Location = \( f(nc(new/used \ vehicle, \ gender, \ age, \ distance, \ percent \ migrants \ from \ out \ of \ state \ in \ the \ town)) \)

Results

Inc. Likelihood
- Buying new vehicle
- Distance

Decr. Likelihood
- Being male
- Larger percent of out of state immigrants in town

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coef.</th>
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<tbody>
<tr>
<td>Intercept</td>
<td>.7763*</td>
</tr>
<tr>
<td>New/Used</td>
<td>1.0956*</td>
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<tr>
<td>Gender</td>
<td>-.04825*</td>
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<tr>
<td>Age</td>
<td>.0103</td>
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<tr>
<td>Distance</td>
<td>2.519 E-8*</td>
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<tr>
<td>% out of state</td>
<td>-.0486*</td>
</tr>
</tbody>
</table>

* indicates variable is significant at the 10% level

Policy Implications and Conclusions

- Possibility of joint program with New Hampshire to capture more purchases
- Recognize towns with larger percent of immigrants – not typical purchase behavior, target for future marketing efforts
- Future Research: Identify relative strength via marginal effects.

Thank You!

Questions or Comments?

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