The Impact of Country of Origin Label on Consumers' Willingness-to-Pay for Organic Food

Jing Xie
Food and Resource Economics
University of Florida

Zhifeng Gao
Food and Resource Economics
University of Florida

Xin Zhao
Horticulture Science
University of Florida

Marilyn E. Swisher
Youth and Community Science
University of Florida


Copyright 2011 by [Jing Xie, Zhifeng Gao, Xin Zhao and Marilyn E. Swisher]. All rights reserved. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.
Motivation from Recent News

In 2008, some frozen organic vegetables sold in the Whole Foods Market (WFM) stores were imported from China with a small country-of-origin label (COOL) on the back beside USDA Organic label. The public began to concern about the quality of the certificate organic food, and criticized that the environmental benefits of the organic products were taking away from the United States. Till 2010 summer, WFM is no longer sourcing any food products from China except for frozen edamame.

Introduction

WFM (Whole Foods Market) stores were importing from China when COOL shows the products is imported. Critics maintained that the environmental benefits of the organic foods were taking away from the United States to organic food. Until 2010 summer, WFM is no longer sourcing any food products from China except for frozen edamame.

Why These Are Interactions Between Two Attributes?

1. Misunderstanding or distrust on USDA organic standards - True: the products carrying USDA organic label have to meet the USDA requirements and that the inspection revealed no exceptions. The products produced in foreign countries follow less stringent standards.

2. Due to different attitudes towards foreign countries, WTP for imported organic food significantly varies among production countries.

3. The organic and country of origin labels affect each other. All of the coefficients of interaction terms are statistically significant.

Survey and Data

We use conjoint analysis (CA) to analyze the interactions between Organic label and COOL. The data were obtained through an online survey conducted in November of 2010 by Toluna, including 390 completes from southeast and northeast of the U.S., who are all age over 18, primary grocery shopper for their household, and purchased fresh produce last month. We have 2 versions of the survey. The only difference between these two is one provides information of what USDA organic label requirements as following, but the other one doesn’t:

Organic US: organic food production: 
- No matter where a product is produced, the same rules and procedures apply. To make sure that products labeled “organic” do meet the USDA requirements. certifying agencies that the USDA has accredited must verify that all of the products and procedures used in production, processing, packaging and transportation comply with the USDA regulations.

Comparing the results of these two surveys:

Table 1: Mixed Logit Model Using Products of USA as Base:

<table>
<thead>
<tr>
<th>Country of Origin</th>
<th>Organic</th>
<th>China</th>
<th>Mexico</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1.000 **</td>
<td>0.318</td>
<td>0.815 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.964</td>
<td>0.378 **</td>
<td>0.647 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.924 **</td>
<td>0.473 **</td>
<td>0.583 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.882 **</td>
<td>0.584 **</td>
<td>0.492 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.841 **</td>
<td>0.640 **</td>
<td>0.487 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0.799 **</td>
<td>0.675 **</td>
<td>0.482 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.756 **</td>
<td>0.700 **</td>
<td>0.477 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.713 **</td>
<td>0.724 **</td>
<td>0.467 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0.670 **</td>
<td>0.745 **</td>
<td>0.458 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.627 **</td>
<td>0.766 **</td>
<td>0.449 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0.584 **</td>
<td>0.787 **</td>
<td>0.440 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0.541 **</td>
<td>0.808 **</td>
<td>0.431 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>0.498 **</td>
<td>0.829 **</td>
<td>0.422 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0.455 **</td>
<td>0.850 **</td>
<td>0.413 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>0.412 **</td>
<td>0.872 **</td>
<td>0.404 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>0.369 **</td>
<td>0.894 **</td>
<td>0.395 **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>0.326 **</td>
<td>0.916 **</td>
<td>0.386 **</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model and Methods

Mixed logit model: this model can captures the heterogeneities in coefficients caused by unobservable attitudinal characteristics crossing individuals.

Assume utility function of individuals is: $U_i = -eta_0 + eta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6 + \epsilon_i$, $\beta_0$: dummy vector of USDA Organic, $\beta_1$: dummy variable of COOL Organic, $\beta_2$: dummy variable of COOL Organic, $\beta_3$: demographic variables, $\epsilon_i$: error term the probability of respondent’s sequence of choices would be given by:

$$P_j = \frac{e^{\beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6 + \epsilon_i}}{\sum_j e^{\beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \beta_5 + \beta_6 + \epsilon_j}}$$

Vector $\beta$ is estimated using maximum simulated likelihood.

Empirical Results

Choice experiment target: Fresh broccoli
Country of Origin: Canada, China, Mexico, and the United States

The empirical results are showing in table 1 (right hand side). We found several interesting results which is consistent with our hypotheses:

1. Heterogeneities in coefficients exist. As shown in table 1, all the standard deviations of random parameters are statistically significant.
2. Different due to attitudes towards foreign countries, WTP for imported organic food significantly varies among production countries.
3. The organic and country of origin labels affect each other. All of the coefficients of interaction terms are statistically significant.

Reference