Price Elasticities of Demand for Food Away From Home (FAFH)

J. William Levedahl
Economic Research Service
Washington, DC
Levedahl@ers.usda.gov


Views expressed herein are those of the author and not necessarily those of the ERS.
Price Elasticities of Demand for Food Away From Home (FAFH)

Objective: Estimate price elasticities for FAFH using cross-sectional data.

Previous Research: Uses cross-sectional data to estimate the effects of income and various socio-demographic variables on overall household FAFH expenditure and the division between types of FAFH expenditure such as full-service versus fast food (e.g., Byrne, Capps and Saha 1996, McCracken and Brandt 1987, Stewart and Yen 2004, Stewart et al. 2004). None have estimated price elasticities.

This Project: Uses a procedure by Deaton (1990) and data from a CREST survey to estimate price elasticities for three types of FAFH facilities: Casual Dining, Mid-Scale, and Quick Service.

Deaton’s Method:

Assumptions

The price levels for each facility type are unobserved but vary spatially across geographic clusters.

Everyone in a geographic cluster faces the same prices so that expenditure on a FAFH facility type, \( E_G \); \( G = 1, 2, 3 \), equals \( E_G = P_G q_G v_G \) where for the \( G \)-th facility \( P_G \) is the price index, \( q_G \) is the number of dining occasions, and \( v_G \) is a composite measure of quality. Expenditure per dining occasion, or the unit value for the \( G \)-th facility, equals \( E_G / q_G = P_G v_G \) so that unit value is the price of quality, \( V_G = P_G v_G \).
Preferences for the individual outlets that make up each FAFH facility type are weakly separable. This leads to an expression that relates the effect of prices on quality in terms of price and income elasticities.

Estimation

Price and income effects are estimated using variations in the expenditure share and unit value of each facility type across the geographic clusters.

Model equations are simply conditional regression functions depending on prices, income and demographic variables. There is no supposition that these equations reflect consumer preferences.

The expenditure share and unit value for each facility type are calculated using observations for both FAFH purchasers and non-purchasers. No attempt is made to account for zero censoring.

Data: The CREST data were collected as a random sample of U.S. individuals contacted via e-mail and asked to visit the questionnaire website. Information is collected daily on FAFH expenditure on the previous day from about 1700 individuals. The data were collected from June to November 2003. A limitation of these data for this study is that the survey is administered to a respondent only once and so provides no information on the respondent’s frequency of FAFH visits other than for the day of the survey. Therefore, observations for respondents with given income/demographic profiles were combined to obtain the group’s average daily expenditure and the expenditure per visit for each FAFH facilities. This taxonomy allows each survey response to reflect the behavior of one of 1344 income/demographic groups across 36 geographic clusters. To insure adequate, size income/demographic/clusters with fewer than 100 responses were
dropped. Estimates are based on 716 income/demographic groups spread over 27 geographic clusters.

Results:

<table>
<thead>
<tr>
<th></th>
<th>Causal Dining</th>
<th>Mid-Scale</th>
<th>Quick Service</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causal Dining</td>
<td>-3.96</td>
<td>5.02</td>
<td>-0.85</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>(1.49)</td>
<td>(1.55)</td>
<td>(1.59)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>Mid-Scale</td>
<td>2.04</td>
<td>-3.12</td>
<td>-0.74</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>(0.63)</td>
<td>(0.54)</td>
<td>(0.64)</td>
<td>(0.42)</td>
</tr>
<tr>
<td>Quick Service</td>
<td>0.01</td>
<td>0.03</td>
<td>-0.11</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.15)</td>
<td>(0.12)</td>
<td>(0.49)</td>
<td>(0.04)</td>
</tr>
</tbody>
</table>

Note: Bootstrap standard errors in parentheses based on 100 draws. Draws consist of re-sampling entire cases of data. Each replication consisted of draws for the 27 clusters with the number of draws equal to the cluster size.

Conclusion:

The results provide a description of FAFH demand. They indicate that both causal (CD) and mid-scale (MS) dining are highly price responsive and are substitutes for each other. On the other hand, quick serve (QS) does not appear to respond to price or show signs of cross-price effects.

What makes Deaton’s procedure so useful is that price elasticities are obtained without observing prices using readily available information on expenditure shares and unit values from cross-sectional data.
References:


