Using Scanner Data To Answer Food Policy Questions

Conference

Wednesday, June 1 - Thursday, June 2, 2011

Economic Research Service
1800 M Street, NW
Waugh Auditorium
Washington, DC
Can Information Costs Affect Consumer Choice?
—Nutritional Labels in a Supermarket Experiment—

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ERS Conference, June 1st and 2nd, 2011

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Healthy Food Choices

• Consumers understand link between nutrition and health
• Nutritional content is not verifiable
• Purchase decisions based on beliefs
• Nutritional labeling and consumer choice (Kiesel, McCluskey, and Villas-Boas 2011)
Research Question

Do information costs prevent consumers from making healthier food choices?

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Information Costs Matter (Results)

- Increases in quantity sales due to no trans fat labels
- Increases in quantity sales due to low calorie labels
- Decreases in quantity sales due to low fat labels (with FDA claim)
- Limited inference on unlabeled products
- No effect of labels that combine multiple claims
Research Design

• Experimental approach implemented in major supermarket

• Repetition of information provided on the Nutritional Facts Panel (NFP), or provision in a new format

- ✓ No Trans Fat
- ✓ Low Calorie
Labeling Treatments

- Five treatments in five different stores

- Low Calorie
- Low Fat
- Low Fat*  
  *According to FDA nutrient content claim

- Low Calorie
- Low Fat
- No Trans Fat
Data

- Weekly store-level data:
  - one product category (microwave popcorn)
  - 14 weeks in fall 2007 (5 weeks prior - 5 weeks post treatment period)
  - 32 stores in Northern California (5 treatment stores and 27 control stores)

- Socio-demographic statistics by zip code
Hidden Information and Salience

- Firms have limited incentive to fully reveal their product quality (e.g. Bonroy and Constantatos, 2008; Gabaix and Laibson, 2006; Chetty, Looney, and Kroft, 2006)
Empirical Strategy: Difference-in-Differences

\[ \ln Y_{i,s,t} = \alpha T_{i,s,t} + \beta C_{i,s,t} + \gamma X_{i,s,t} + \mu_j + \eta_s + \tau_t + \epsilon_{i,s,t} \]

- \( Y_{i,s,t} \) = quantity sales of product \( i \), store \( s \), and week \( t \)
- \( T_{i,s,t} \) = average treatment effect
- \( C_{i,s,t} \) = controls within DD, or DDD
- \( X_{i,s,t} \) = additional covariates
- \( \mu_j \) = brand fixed effects
- \( \eta_s \) = store fixed effects
- \( \tau_t \) = week fixed effects
**Triple Difference for Store-Specific Average Treatment Effects**
(aggregated by treatment and pre-treatment period)

**dependent variable:** (log) quantity microwave popcorn (by 4 weeks, by store)

<table>
<thead>
<tr>
<th>independent variables:</th>
<th>low calorie</th>
<th>low fat</th>
<th>low fat (FDA)</th>
<th>low cal/fat</th>
<th>all labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>label<em>treated store</em>period</td>
<td>0.289 **</td>
<td>-0.166</td>
<td>-0.426 *</td>
<td>0.024</td>
<td>0.043</td>
</tr>
<tr>
<td>treatment period*label</td>
<td>0.125</td>
<td>0.179</td>
<td>0.224</td>
<td>0.141</td>
<td>0.102</td>
</tr>
<tr>
<td>treatment period*store</td>
<td>-0.014</td>
<td>0.055</td>
<td>0.053</td>
<td>0.063</td>
<td>0.111 ***</td>
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<tr>
<td>treated store*label</td>
<td>-0.107 **</td>
<td>-0.051</td>
<td>0.053</td>
<td>-0.052</td>
<td>-0.080</td>
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<tr>
<td>label</td>
<td>-0.131 *</td>
<td>-0.086</td>
<td>-0.075</td>
<td>-0.102</td>
<td>-0.051</td>
</tr>
<tr>
<td>treatment period</td>
<td>-0.266 ***</td>
<td>-0.389 **</td>
<td>-0.398 ***</td>
<td>-0.346 ***</td>
<td>-0.433 ***</td>
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<tr>
<td>all labels</td>
<td>0.037</td>
<td>0.037</td>
<td>0.037</td>
<td>0.035</td>
<td>0.049</td>
</tr>
</tbody>
</table>
**Triple Difference: Differentiated Average Treatment Effects**
(aggregated by treatment and pre-treatment period)

**dependent variable:** (log) quantity microwave popcorn (by 4 weeks, by store)

<table>
<thead>
<tr>
<th>independent variables:</th>
<th>low cal/fat</th>
<th>low cal/fat/transfat</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>interacted treatment effects</strong></td>
<td></td>
<td></td>
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<tr>
<td>low calorie</td>
<td>0.119</td>
<td>-</td>
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<tr>
<td></td>
<td>0.130</td>
<td></td>
</tr>
<tr>
<td>low fat</td>
<td>-0.171</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>0.249</td>
<td></td>
</tr>
<tr>
<td><strong>no transfat</strong></td>
<td>-</td>
<td>0.396 **</td>
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<tr>
<td>low cal/fat</td>
<td>-0.018</td>
<td>-0.182</td>
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<td></td>
<td>0.165</td>
<td>0.278</td>
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<tr>
<td>low cal/trans fat</td>
<td>-</td>
<td>-0.169</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.180</td>
</tr>
<tr>
<td>low fat/trans fat</td>
<td>-</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>0.227</td>
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<tr>
<td>low cal/fat/trans fat</td>
<td>-</td>
<td></td>
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<tr>
<td></td>
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<td>0.186</td>
</tr>
</tbody>
</table>
Synthetic Control Method
(Abadie, Diamond, Hainmueller 2007)

- considers any weighted average of control units as potential (synthetic) control

Low calorie label

Increase in sales by 18.7 units (19.6%)

Low fat label

Decrease in sales by 27.7 units (68.0%)
Additional Robustness Checks

- Use each control store and estimate **Placebo** treatment effect
Conclusions and Implications

• Information costs matter:
  Information provided on NFP is not efficient and could prevent welfare improving changes to food choices

→ Short relative claims on shelf or front package

• Consumers taste perceptions matter

→ Focus on calorie content

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A donut, huh? What did you weigh today?

Only 90 kilos.

What's that in pounds?

If you're too uninformed to do the conversion, I'm not going to do it for you.

This is low... hiding behind the metric system.

Thank you!