Result II: Information Rigidity

- Although firms paid menu costs, more than half of prices did not change on a tax-excluded basis (as in Figure 1).
- The second set of results indicate that this price stickiness was driven by information gathering costs.

Identification strategy: As the number of products sold increases,
1. menu costs increase (i.e., firms have to replace a larger number of price tags), whereas
2. information gathering costs do not increase (i.e., information on common shocks can be used for repricing all products).
- I quantify the impact of economies of scope on price adjustment.

A: Logit model estimation
\[ Pr(I_{ls} = 1, 0 | X_{ls} = x) = \Phi(\beta X_{ls}) \]
- \( I_{ls} \) is the price-change indicator for item \( i \) sold at store \( s \).
- Explanatory variables \( X_{ls} \) include the number of products a firm sells (\( N \)) and control variables.

B: Regression equation
\[ Size_{ls} = \gamma X_{ls} + \epsilon_{ls} \]
- \( Size_{ls} \) is the size of non-zero price changes for item \( i \) sold at store \( s \).

Table 1: Estimation results

<table>
<thead>
<tr>
<th></th>
<th>April 2013</th>
<th>April 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unconditional</td>
<td>Conditional</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>( \log_{10} N )</td>
<td>0.0131</td>
<td>0.0383</td>
</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(0.0007)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,845,880</td>
<td>2,105,716</td>
</tr>
<tr>
<td>( \log_{10} N )</td>
<td>-0.0064</td>
<td>-0.0040</td>
</tr>
<tr>
<td></td>
<td>(0.0005)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>Observations</td>
<td>376,883</td>
<td>696,150</td>
</tr>
</tbody>
</table>

Summary

- Main findings:
  1. Prices became less sticky after the tax hike, suggesting that firms paid menu costs (i.e., attached new price tags).
  2. Nonetheless, more than half of prices did not change on a tax-excluded basis, suggesting that firms faced information gathering costs.
- This argument was verified in light of multi-product firms’ price-setting behavior. Specifically, the tax hike induced firms to pay a large portion of variable costs associated with price adjustment (menu costs), meaning that the remaining costs are fixed costs (information gathering costs) and economies of scope had a larger impact.
- Japan’s experience indicates that raising consumption taxes can be an effective policy measure to stimulate the economy.

References