Generate ISIC-based price deflator from CPI

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Link COICOP to ISIC

• No simple 1-to-1 correspondence possible

• For example:
  • 01.1 Food
  • 02.2 Tobacco
  • 03.2 Footwear

• Can be sold in many different types of stores, for example:
  • 4711 Retail sale in non-specialized stores with food, beverages or tobacco predominating
  • 4719 Other retail sale in non-specialized stores
  • 4721 Retail sale of food in specialized stores
  • 4723 Retail sale of tobacco products in specialized stores
  • 4730 Retail sale of automotive fuel in specialized stores
  • 4771 Retail sale of clothing, footwear and leather articles in specialized stores
  • 4791 Retail sale via mail order houses or via Internet
Price indices for deflating turnover in retail trade

• Available:
  • Price index by product (from CPI)
  • Classified according to COICOP
  • E.g. “Price of cigarettes increased by 5%”

• Needed:
  • Price index by type of store
  • Classified according to ISIC
  • E.g. “Prices in supermarkets increased by ???”
Transform the COICOP information to ISIC information

- We need to know:
  - How much of each product is sold in different types of stores (or elsewhere)
Transform COICOP info to ISIC info

<table>
<thead>
<tr>
<th>ISIC 4</th>
<th>Food</th>
<th>Cigarettes</th>
<th>Shoes</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail sale in non-specialized stores with</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>food, beverages or tobacco predominating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4711</td>
<td>80%</td>
<td>20%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>4719 Other retail sale in non-specialized</td>
<td>20%</td>
<td>20%</td>
<td>60%</td>
<td>0%</td>
</tr>
</tbody>
</table>

- Let’s say from CPI we have price index for:
  - Food = 105.6
  - Cigarettes = 110.8
  - Shoes = 125.0

- For 4711:
  - Price index composed of price indices for food and cigarettes
Transformation

\[ P_{4711} = w_{\text{food}} \times P_{\text{food}} + w_{\text{cig}} \times P_{\text{cig}} \]
\[ = 0.8 \times P_{\text{food}} + 0.2 \times P_{\text{cig}} \]
\[ = 0.8 \times 105.6 + 0.2 \times 110.8 \]
\[ = 106.64 \]

\[ P_{4719} = w_{\text{food}} \times P_{\text{food}} + w_{\text{cig}} \times P_{\text{cig}} + w_{\text{shoe}} \times P_{\text{shoe}} \]
\[ = 0.2 \times P_{\text{food}} + 0.2 \times P_{\text{cig}} + 0.6 \times P_{\text{shoe}} \]
\[ = 0.2 \times 105.6 + 0.2 \times 110.8 + 0.6 \times 125.0 \]
\[ = 118.28 \]
Deflators

• The price deflators for these ISIC retail classes are:
• For ISIC 4711 : 106.64
• For ISIC 4719 : 118.28