Stratification Method in House Price Indices: An example from Iceland

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OOH in the Icelandic CPI

• User cost
  – Annuity payment

• Inputs
  – Life span of the property
    • 80 years
  – Interest rate
    • Long term real interest rates
  – Present value
    • Household budget survey
    • House Price Index
Data

- Administrative data
  - Icelandic Property Registry
- Variables used
  - Year and month
  - Area
  - Type
  - Size (categories)
  - Number of contracts
  - Average price per m$^2$ (geometric mean)
  - Average present value (arithmetic mean)

Stratification

- Price changes calculated for 26 strata
  - Three geographic areas
    - Inner capital area
    - Outer capital area
    - Outside capital area
  - Two types of properties
    - Detached and semi-detached houses
    - Flats
  - Size categories
    - 4 – 5 categories for each area and type of property
## Price changes

<table>
<thead>
<tr>
<th>t</th>
<th>n</th>
<th>p/m²</th>
<th>n*p</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>123</td>
<td>2460</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>153</td>
<td>1989</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>146</td>
<td>2190</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>155</td>
<td>3875</td>
</tr>
</tbody>
</table>

- Average price per m²
- 3-month average price (p)
  - Small market
  - Delay in notarisation
- Price change between time periods 3 and 4:

\[
\frac{b}{a} = \frac{\sum(n^*p)}{\sum(n)}
\]

<table>
<thead>
<tr>
<th>t</th>
<th>a= Sum(n)</th>
<th>b= Sum(n*p)</th>
<th>b/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>48</td>
<td>6639</td>
<td>138</td>
</tr>
<tr>
<td>4</td>
<td>53</td>
<td>8054</td>
<td>152</td>
</tr>
</tbody>
</table>

\[
\left(\frac{152}{138} - 1\right) \times 100 = 10.1\%
\]

## Lower level weights

- Present value of properties sold in each strata
- Superlative index (Fisher)
  - Two vectors, 36 months each
  - Laspeyres: periods 1-36
  - Paasche: periods 12-48
Calculation and dissemination

• Fisher index
  – Laspeyres
  – Paasche
  – Geometric average

• Published indices
  – Capital area, multi-flat houses
  – Capital area, single-flat houses
  – Outside capital area, total
  – Whole country, total

Evaluation

Strengths
• Simple
  – Methodology
  – Technology
• Doesn't require very detailed data
• Flexibility

Weaknesses
• Data requirements
  – Price and quantity
• Detailed stratification
  – Can cause problems in small markets or during recessions
• Quality differences