IMPROVEMENT OF OMAN CONSUMER PRICE INDEX

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Practical Experiences with Calculating Elementary Indices and Treatment of Missing Prices

Presentation by Dr. Cem BAŞ, TURKSTAT

Calculation of Elementary Aggregate Indices

Idealized World

- According to the Laspeyres formula, the price index is a weighted arithmetic average of changes in the individual price of the different transactions covered by the index.

- The weights correspond to the shares of the different varieties in the total value of expenditures at the base period.

- The transactions are clearly defined goods and services, that is, perfectly homogeneous.

Calculation of Elementary Aggregate Indices

Real World

- Huge number of transactions
- difficult to obtain reliable weights at the transaction level. (Usually only available at a higher level of aggregation.)

Calculation of Elementary Aggregate Indices

Unweighted Index Formulas

- Carli: Average of Price Relatives

- Dutot: Ratio of Average Prices

- Jevons: Geometric Average

Calculation of Elementary Aggregate Indices

Dutot Index for an Item

- The ratio of average (arithmetic) prices

$$I_D^{o;t} = \frac{\dfrac{1}{n}\sum p_i^t}{\dfrac{1}{n}\sum p_i^o} = \frac{\sum p_i^t\left(\dfrac{p_i^o}{p_i^o}\right)}{\sum p_i^o} = \frac{\sum p_i^o\left(\dfrac{p_i^t}{p_i^o}\right)}{\sum p_i^o}$$

for a set of varieties in the current period to the average price of the same (matching) set of transactions in the base period.

Calculation of Elementary Aggregate Indices

Carli Index for an Item

- The arithmetic average of price relatives

$$I_C^{0:t} = \frac{1}{n} \sum \left(\frac{p_i^t}{p_i^0} \right)$$

Unweighted average of the long-term price relatives (current /base period price)

For the same (matching) set of transactions.

Calculation of Elementary Aggregate Indices

Jevons Index for an Item

- The geometric average of price relatives

$$I_J^{0:t} = \prod \left(\frac{p_i^t}{p_i^0} \right)^{1/n} = \frac{\prod \left(p_i^t \right)^{1/n}}{\prod \left(p_i^0 \right)^{1/n}}$$

Unweighted average of the long-term price relatives (current /base period price)

For the same (matching) set of varieties.

= ratio of geometric avg. prices in current period to geo. Avg. prices in base period.

Calculation of Elementary Aggregate Indices

Recommendations

- Select items/products with the objective of achieving homogeneous items.

- Don't use the Carli formula

- Use Dutot to calculate indices at the elementary aggregate level only for homogeneous products.

- Use Jevons to compile elementary indices

Treatment of Missing Prices in CPI

In case of *temporarily* missing prices (for non-seasonal items) prices are imputed. In case of temporarily missing observations
one of four actions may be taken.

- Omit the variety, for which the price is missing, in the previous month, so that a matched sample is maintained (like is compared with like).

- Carry forward the last observed price.

- Impute the missing price by the average price change of the prices which are available in the elementary aggregate.

- Impute the missing price by the price change of a comparable item from another similar outlet.

Carry forward should not be used unless there is clear evidence that the

price would remain constant.

Treatment of Missing Prices in CPI

An item variety that disappears *permanently* from an outlet should be replaced by a similar variety from the same outlet.

Where a quality difference occurs, a quality adjustment should be made.

If a similar variety cannot be found in the same outlet a replacement should be found in another outlet.

Thank you...