

# IMPROVEMENT OF OMAN CONSUMER PRICE INDEX

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## **Sampling of CPI**

Presentation by Dr. Cem BAŞ, TURKSTAT

# Sampling Procedures

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In general, national statistics institutes adopt four levels of sampling for local price collection:

- Locations
- Outlets within locations
- Items within different sections of the expenditure classification
- Product varieties

# Sampling Procedures

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- Stratification is also frequently used to increase sampling efficiency, especially where the retail market is heterogeneous.
- Often a mixture of probability sampling and non-probability (purposive) sampling is used.

# Sampling Procedures

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The ultimate goal of sampling should be:

- An overall sample which is representative of the total population of goods and services being offered for sale.
- A variance or mean square error which is as low as possible.
- The entire set of sample prices should be optimised to meet the publication needs of the CPI, taking into account user requirements, practical data collection considerations and cost.

# Sampling Procedures

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Sampling for a CPI has three dimensions:

- 1) The product dimension.
  - Product lists & sales information from wholesalers & outlets (shelf-space a proxy for sales), recent HBS.
- 2) The geographical and outlet dimension.
  - Business registers, telephone directories, recent HBS.
- 3) The time dimension.

# Sampling Procedures

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- ❖ Sampling techniques are used because to include all goods and services would be both costly, and time consuming.
- ❖ There are two basic methods of sampling:
  - Probability sampling
  - Non-probability (purposive) sampling

# Sampling Procedures

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There are three main methods of probability sampling.

- Simple random sampling
- Systematic sampling
- Stratified random sampling with probability proportional to size

The sampling frames required for probability sampling are rarely available.

# Sampling Procedures

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Two options are available when there is no sampling frame.

- Created a sampling frame or use non-probability sampling.

Non-probability sampling can help to ensure that.

- Samples can be monitored over a long period.
- Price collection takes place in accessible areas where there price collectors.
- Costs are kept to a minimum.



# Sampling Procedures

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Non-probability sampling techniques include.

- Cut-off sampling.
  - E.g. excluding rural areas or small shops.
- Quota sampling.
  - E.g. pricing to achieve a pre-determined number of price quotes by product group or item list.
- “Representative item” method.
  - E.g. using a tight specification list to select items to be priced in a shop.

# Sampling Procedures

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- Generally country size has no bearing on the precision of a sample estimate.
  - Only the size and allocation of the sample affects the precision of the sample estimate.
  - Sample size and the precision of the estimate of price change depends on the homogeneity of the retail market.
- Sample size also depends on published sub-indices.
  - The sample size for both the rural and urban price collections should be sufficiently large to provide reliable and publishable indices for each sector.

## Sampling of Location (Region)

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Location selection can take place, separately within each region for a large country, using Probability Proportional to Size (PPS) sampling with a size measure relating to retail turnover or an appropriate proxy such as number of employees in the retail sector or the total number or population in the regions .

# Sampling of Outlets and Items

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## Sampling Techniques

- Probability sampling techniques ensure that each element (region, outlet, item) has a known chance of being selected
- Ensures that the selection is not subjective, and allows for the calculation of sampling errors, essential for the assessment of accuracy
- The representativeness of purposive sampling depends on the judgment of the statistician.
- For mainly practical reasons, such as the absence of an appropriate sampling frame and the high cost of implementing a probability sampling, purposive sampling is generally used at most levels. <sup>12</sup>

# Sampling of Outlets and Items

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## Sampling Frames

- Business register (complete and up-to-date?)
- Household lists
- Stratification variables included (ISIC, output or sales, location; income, household expenditures, etc.)

# Sampling of Outlets and Items

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## Outlet Sampling

- This may be undertaken using probability or judgmental methods. In either case the aim is to make the sample of outlets **representative** of the population.
- The sampling frame for outlet is the list of outlets and traders from which the sample selection is made.
- Any deficiency in the frame is carried over to the results. For example, if the frame is out of date and excludes recent super/hyper-markets with below average prices, or is confined to city areas with above average prices, the results will be biased no matter how judicious the selection of outlets from the frame and the collection of prices from the outlets.

# Sampling of Outlets and Items

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- Larger outlets should be given a commensurate higher probability of selection. As a result there may be a judgmental or purposive element selected to the sampling. Cut-off sampling based on choosing the largest outlets can be undertaken numerically or subjectively. In many cities the largest sellers can be readily identified.

# Sampling of Outlets and Items

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- Make a representative choice of outlets, with due account taken of consumer habits in the region, the various distribution channels, the types of stores and methods of sale, industries, and the size and location of the businesses.
- Choice to be made with the cooperation of the regional agencies responsible for the survey, who are more familiar with the local situation.
- Cooperate with outlets' managers to choose from among the large number of items whose prices will actually be collected.



# Sampling of Outlets and Items (In Turkey)

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The products chosen must be:

- current products sold in significant quantities to ensure that the price changes recorded are significant from a consumer's viewpoint.
- expected to remain available for a certain period of time, so that changes in pure prices (prices unaffected by other factors) can be recorded.
- chosen in close cooperation with the managers of outlets and reporting establishments, who know best selling products (currently), the variants of the various items, and changes in the product mix; they generally make sound choices.

## Sampling of Outlets and Items (In Turkey)

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- Number of items in the CPI basket : 444
- Total number of items at variety level: 1169
- Number of outlets : 27 500
- Number of tenants : 3 393
- Number of settlements (province) : 81  
(sub-city) : 74

# Inclusion of New Goods and Services in CPI

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New goods and services should be included in the CPI when they attain economic importance. Inclusion of newly significant goods and services can take place in three ways

- The new products can be included in an existing elementary aggregate.
- A new elementary aggregate can be formed and the weight taken from one or more other elementary aggregate(s) which are partly or wholly substituted by the new product.
- A new elementary aggregate can be formed and all weights can be rescaled to unity.

# Inclusion of New Goods and Services in CPI

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A new product can be included in an existing elementary aggregate by linking the prices of the new product into the existing index, so that the inclusion of the new product does not affect the index.

It was recommended that elementary aggregate indices should be included/excluded in the index each year in January to avoid discontinuities and as a practicable working rule.

Annual revision of the weights should be sufficient to ensure that newly significant goods/services are included in the CPI in a timely manner.

Because of the time lag between the weight reference period and the price reference period, the weights should always be examined and cross-checked against more recent data.

## Outlet selection:

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The outlets are selected to the sample on the basis of the experience of the price collectors and their knowledge of the local market. The main criteria for the selection of outlets in each locality are the coverage of the available shopping areas within each location and the degree to which different types of outlets are represented. The number of outlets sampled varies depending on the size of the locality and the type of item being priced. Once a year, usually in November and December, the outlet sample is reviewed and updated.

## Outlet selection:

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The sample covers different types of outlets, from market stalls, craft undertakings, traditional shops, single-line retail shops, big shopping centres, restaurants, hotels and catalogues. Prices for fresh fruit and vegetables, fish are collected from market stalls as well as supermarkets and traditional shops; prices for package holidays are collected from catalogues.

## **Techniques of product selection and specification:**

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The representative products to be priced are selected judgementally at the end of every year by central price statistics staff, who also determine their specification. Product specifications are discussed and agreed at the meetings done with price collectors, who previously collect information about them. The products are selected on the basis of information obtained from detailed HBS data, price collectors' suggestions, producer information, market research data and other sources.

# Techniques of product selection and specification:

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The decision which product will be observed in a specific outlet is taken by price collectors. Price collectors are instructed to select the most adequate product available in the outlet taking into consideration its specification as well as the instructions for selecting product offers agreed in joint meetings (head office staff and price collectors) at the beginning of each year.



# Techniques of product selection and specification:

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The specifications for an individual good/service are more or less detailed, indicating size, unit, materials, brand characteristics, in some cases the quality and price levels. How tight or loose the specification will be depends on the nature of the product. If a product has many characteristics could effect its price, the specification is more exact. There are detailed specifications on cars, tech products, medical, tobacco goods and some services. For some products such as food and some garments, specifications are looser.

## Example Air Plane Tickets:

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HBS only gives the consumption of air plane ticket (COICOP - 0733001). We contact with the companies to take the endorsement proportion of flights origin to destination detail. By using that information we calculate the weights and determine the variables of air plane tickets. There are 3 companies in our basket and their geographical classes. We can not use ticket conditions because the early reservation price depends on the number of the remaining empty seats on plane. So the price level of the same condition always give the relative price change.

## Example fee for cellular phone calls:

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HBS only gives the consumption of cellular phone calls (COICOP - 0830004). As we do for air plane tickets, we contact with the companies to take the endorsement proportion of cellular phone calls in the firm, tariff and type of call details. After that we calculate the weights and determine the variables of cellular phone calls. There are 3 companies in our basket and tariff and tpe of call details.

# Example fee for cellular phone calls:

<b>Invoice</b>		
Firm A	Tariff 1	in-tariff call out-tariff call stationary line call SMS Package fee
	...	
	Tariff N	in-tariff call out-tariff call stationary line call SMS Package fee
Firm B	...	...
...	...	...
Firm C	...	...
...	...	...
<b>Pre-paid (20 T.L.)</b>		
Firm A	Tariff 1	in-tariff call out-tariff call stationary line call SMS
	...	
	Tariff N	in-tariff call out-tariff call stationary line call SMS
Firm B	...	
...	...	
Firm C	...	
...	...	
<b>Pre-paid (30 T.L.)</b>		
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<b>Pre-paid (50 T.L.)</b>		
...		

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Thank you...