Weighting and estimation procedures

UN Handbook
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Outline of this presentation

– General remarks on weighting and estimation procedures

– Business surveys
  - Population target variable
  - Recommendation on size weights
  - Estimators and weights

General remarks on target variable, estimation procedures and weights

<u>Sample</u>:

Individual firm/consumer answers on the variable of interest

<u>Estimation procedure</u>
- Choice of estimator
- Use of weights (sample weights and size weights)

<u>Population target variable</u>:

The variable of interest, (unknown) true value

BTS: estimation of target variable

Population target variable fort business tendency variable:

$$Y = \frac{1}{W} \sum_{i=1}^{N} w_i y_i$$

In words: the population target variable is the weighted mean of the target variable for all units in the population

BTS: importance of size weights

Why: importance of answers is assumed to depend on the size of the reporting unit (reflects economic importance)

What to use for size weights:
- Ideally, variables used as weights should depend on the target variable, based on economic rationale.

However, not every variable is available at firm level (or not even at stratum level). In practice most used:
- employment
- turnover
- value added

BTS: recommendation on size weights

Two step weighting (sample design based on stratification)
- Unit level weight (within a stratum)
- Aggregate level weight (strata to (sub)total)

Different auxiliary information per step possible:
- On firm level employment is mostly used
- On stratum level value added is recommended

It is possible to derive a proxy of value added / firm by using the employment within a stratum as weight

BS: estimators and weights

To estimate the population target variable based on the sample response, two widely used estimators are available:

– Horvitz-Thompson estimator
– Ratio estimator

These estimators uses (potentially different) inclusion probabilities as 'sample weights'

Sample weights and size weights can work in opposite direction (a small firm can get a high sample weight, but small size weight)

Thank you for your attention!