Quarterly National Accounts

Challenges in compiling QNA- Linking of QNA

UNSD Workshop on National Accounts

6-9 July 2009, New Delhi, India

UN Statistics Division

Main Concepts of Chain Linking

- The term linking is used when joining two time series with different base year in order to achieve long time series with the same reference base.

- The term splicing is only used when joining index series.

Main Concepts of Chain Linking

- *1993 SNA* recommends moving from fixed-base year constant price estimates to chain-linked volume measures
- Changing/updating the base year and time series?
- Linking the old base data to data on the new base?
- 1993 SNA recommends changing the base period annually

Base period/Weight period/reference period

- **Base period**: Base of the price or quantity ratio being weighted together :Pricing year for the constant price data
- **Weight period:** period from which weights are taken
- **Reference period** :Period for which the index series is expressed as equal to 100.
- Chain-linked indices do not have a particular base or weight period
- Reference period – free to choose

$$I_{0\to t} = I_{0\to(t-h)} \bullet I_{(t-h)\to t}$$

Techniques for Annual Chain-Linking of Quarterly Data

- **2 alternative techniques:**
  - Annual overlaps
  - One-quarter overlaps
- **A third technique sometimes is used – "over-the-year technique"**
  - Should be avoided

The Annual Overlaps Technique

- Compiling estimates for each quarter at the weighted annual average prices of the previous year
- Subsequent linking using the correspondent annual data to provide linking factors

The One-Quarter Overlap Technique

- Compiling estimates of each quarter of year t at the weighted average prices of previous year
- Compiling estimates for the overlap quarter (4th quarter of year t-1) at the weighted average prices of the same year t-1
- The ratio between the estimates for the linking quarter at the average prices of year t-1 and average prices of year t-2 provides the linking factor to scale down (to the prices of t-2) the quarterly estimates of year t at prices of year t-1.

The Over-the-Year Technique

- Compiling estimates for each quarter at weighted annual average prices of the current year.
- Compiling estimates for each quarter at weighted annual average prices of the previous year.
- The year-on-year changes derived from these constant price data are used for extrapolating the quarterly constant price data of the reference period.

The Three Techniques

Chain linked indices (Average 1999=100)			
Period	Annual overlap technique	One-quarter overlap technique	Over-the-year technique
2001 Q1	130.78	132.09	128.59
2001 Q2	127.17	128.44	128.09
2001 Q3	138.04	139.42	137.27
2001 Q4	185.30	187.15	187.15

Chain-Linked Measures and Non-additivity

- Additivity – consistency in aggregation for index numbers
- Chain-linked volume measures are non-additive

Which Technique to Choose?

- Chain-linking using the one-quarter overlap technique, combined with benchmarking gives the best results.
- In many cases annual overlap technique gives similar results.
- The over-the-year technique should be avoided! (distorted seasonal pattern in the linked series)