



# **Quarterly National Accounts**

## **Challenges to compilation of QNA**

### **Volume estimates**

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## Volume measures -defined

- ▶ The term volume is used for measures that exclude the effects of changes in prices.
- ▶ The exclusion of the effect of price changes means that changes in a time series of volume measures are driven by quantity and quality changes.
- ▶ Volume is obtained when prices of a previous period are used for valuation
- ▶ Changes in volume arise due to changes in “**product-mix**” or **quality** and **quantity**
- ▶ Change in product mix reflect change in quality and not quantity



## Volume measures -defined

### ▶ **Quantity**

- Unit for measuring an amount of good or service

### ▶ **Price**

- Value of one unit of good or service (of same quality)

### ▶ **Value**

- Price multiplied by quantity



## Volume measures and real measures

- ▶ Changes in values (both stocks and flows) at current prices **that have quantity and price dimensions** can be decomposed into
  - changes in prices and
  - changes in volumes
- ▶ Measured at constant prices, we say the values are in volume terms
- ▶ Changes in values (both stocks and flows) at current prices **that do not have quantity and price dimensions** are measured in real terms (at constant purchasing power) by deflating



## *Methodology for compiling volume estimates of GDP*

### **Double deflation method**

- ▶ Suitable deflators/price indices are used to deflate
  - output and
  - intermediate consumption ,
  - with their respective price indices for each industry.
- ▶ GDP at constant prices is the sum of value added by industry at constant prices plus deflated taxes less subsidies on products.
- ▶ Theoretically, price indices should be of the Paasche type, but in practice, price indices compiled are generally of the Laspeyres type.



## *Methodology for compiling volume estimates of GDP*

- ▶ Approximation to double deflation the volume index for gross output may be used when
  - Index for intermediate inputs is not available; or
  - Input data are not accurate
  
- ▶ Underlying assumption:
  - input/output coefficients are fixed



## *Methodology for compiling volume estimates of GDP*

### **Single extrapolation**

- ▶ gross value added is extrapolated using an appropriate volume indicator
  - output data
  - employment data

### **Single deflation**

- ▶ gross value added is deflated directly using
  - output deflator
  - wage index
  - a general measure of inflation like the CPI or a subcomponent



## *Methodology for compiling volume estimates of GDP*

### **Single indicator methods/extrapolation (most commonly used)**

- ▶ Value added in the base year is extrapolated by a volume index for output. Volume index for output is preferred, an index based on inputs has greater bias:
  - number and variety of outputs is smaller than the variety of intermediate goods and services (and labour) consumed in the production process
  - commodity composition of inputs is more variable over time





## *Methodology for compiling volume estimates of GDP*

**Single indicator** : Intermediate inputs as an indicator

- ▶ A volume index for inputs may be used as a single indicator for value added in exceptional cases:
- ▶ Examples are construction and capital goods producing industries, where it is difficult to measure output in constant prices.



## Employment as an indicator

Volume index for inputs of labour services may be used

- ▶ hours worked, possibly weighted according to hourly wages paid to different kinds of workers, which accounts for
  - changes in hours worked
  - changes in the composition of the labour force
- ▶ numbers employed is more common in practice, in particular for:
  - government services
  - financial, business, entertainment services



## *Methodology for compiling volume estimates of GDP*

- ▶ In general price deflation is to be preferred compared to volume extrapolation in the calculation at constant prices. There are two reasons for this:
- ▶ Price index series tend to be more reliable and easy to compute compared to volume indices. The reason is that indices are normally calculated on the basis of samples where the variance is smaller for price relatives than for quantity relatives. Thus, the sampling error should be smaller for a price index than for a volume index.
- ▶ It is easier to account for volume changes associated with new goods and services when estimates at current prices are deflated.



## Challenges: estimation of volume measures

### (i) Lack of detailed price index series

- Price indices are generally of the Laspeyres type instead of Paasche type
- Use of price index of a similar variable
- Use of a general index such as the all items CPI or PPI

(ii) **Lack of proper volume indices** such as the Index of Industrial Production and the use of crude quantity indicators, to measure changes.

(iii) Difficult to compile price index for complex goods and services. e.g. Machinery of a specific kind



## Challenges: Methodology for compiling volume measures (specific cases)

- ▶ **Volume measures of taxes/subsidies on products** are estimated by
  - applying base-year tax rates to the volume of transactions subject to a specific tax/subsidy or
  - by extrapolating the base-year tax/subsidy using a volume extrapolator of transactions subject to a specific tax/subsidy.
  
- ▶ **Output volume of trade margins** are estimated by
  - applying the base-year-margin rates to the corresponding volume of sales, or
  - or by extrapolating the base-year-trade margins using volume extrapolators of sales.



Thank You