

Training workshop for COSIT, Iraq
Compilation of Constant-price Estimates of National Accounts
- at National and Regional Levels
22nd – 25th October 2007
Cairo, Egypt

Handout-2: GDP at Constant Prices - Production Approach: Methods

Double Indicator Methods

- (i) Revaluation of output and intermediate consumption.
- (ii) Double deflation.
- (iii) Double extrapolation.
- (iv) Deflation and extrapolation, combination.

Single Indicator Methods

- (i) ***Single Output related indicator methods:*** Three alternative methods are available:
 - (a) **Direct deflation** of current-price value added by a gross-output **price index**.
 - (b) **Direct extrapolation** of base year value added using a gross output **volume index**.
 - (c) **Direct extrapolation** of base year value added using indices based on **physical quantity output measures**.
- (ii) ***Single input related indicator methods:*** There are eight alternatives methods:
 - (a) **Direct deflation** of current price GVA by a **price index** of intermediate consumption.
 - (b) **Direct deflation** of current-price GVA by a **wage rate index**.
 - (c) **Direct extrapolation** of base year GVA by a **volume index of intermediate consumption**.
 - (d) **Direct extrapolation** of base year GVA using an index of **deflated compensation of employees** by a wage rate index.
 - (e) **Direct extrapolation** of base year GVA by an index based on **physical quantities of inputs** other than labour.
 - (f) **Direct extrapolation** of base year GVA by an **index of numbers employed**.
 - (g) **Direct extrapolation** of base year GVA by an **index of man hours worked**.
 - (h) **Direct extrapolation** of base year GVA by an index **of hours or man-hours worked adjusted for change in labour productivity**.
- (iii) ***Other methods:*** The other method of obtaining constant price value added which do not fall into any of the above categories. For example, measurement of constant price value added may combine output and input indicators.

<u>Double Indicator Methods</u>					
Revaluation of output	$QY_t \times PY_0 - QC_t \times PC_0$				
Double Deflation	$Y_t / IPY_t - C_t / IPY_t$				
Double Extrapolation	$Y_0 \times IVY_t - C_0 \times IVC_t$	using	volume	index	as
	or $Y_0 \times IQY_t - C_0 \times IQC_t$	using	quantity	index	as
Extrapolation-Deflation combination	$Y_0 \times IVY_t - C_t / IPC_t$	Using	volume	index	as
	or $Y_t / IPY_t - C_0 \times IVC_t$	extrapolators			
	$Y_0 \times IQY_t - C_t / IPC_t$	Using	quantity	index	as
	or $Y_t / IPY_t - C_0 \times IQC_t$	extrapolators			
<u>Single Indicator Methods</u>					
<u>Single output-related indicator methods</u>					
Direct deflation by price index of output			VA_t / IPY_t or VA_t / CPI_t		
Direct Extrapolation by gross output volume index	$VA_0 \times IVY_t$		with $IVY_t = Y_t / IPY_t$		
Direct Extrapolation by physical quantity output index	$VA_0 \times IQY_t$				
<u>Single (intermediate consumption) input-related indicator methods</u>					
Direct deflation by price index of inputs			VA_t / IPC_t		
Direct deflation by wage rate index			VA_t / IW_t		
Direct Extrapolation by volume index of inputs			$VA_0 \times IVC_t$		
Direct Extrapolation by an index of compensation to employees deflated by wage rate index	$VA_0 \times SAL_t / IW_t$				
Direct Extrapolation by an index based on physical quantities of inputs other than labour	$VA_0 \times IQC_t$				
Direct extrapolation by an index of numbers employed	$VA_0 \times IN_t$				
Direct extrapolation by an index of man-hours worked	$VA_0 \times IH_t$				
Direct extrapolation by an index of man-hours worked adjusted for change in labour productivity	$VA_0 \times IH_t^*$				
Notations:					
VA_0 : Current-price value added in the base year	VA_t : Current-price value added in year t				
PY_0 : price of output in the base year	QY_t : quantity of output in year t				
PC_0 : price of intermediate consumption in the base year	QC_t : quantity of intermediate consumption in year t				
Y_0 : gross value of output in the base year	Y_t : gross value of output in year t				
C_0 : gross value of inter. consumption in the base year	C_t : gross value of inter. consumption in year t				
IPY_t : price index of gross output in year t	IPC_t : price index of intermediate consumption in year t				
IVY_t : volume index of gross output in year t	IVC_t : volume index of inter. consumption in year t				
IQY_t : physical quantity output index in year t	IQC_t : physical quantity inter. consumption index in year t				
CPI_t : consumer price index (or its relevant component) in year t	IW_t : nominal wage-rate index in year t				
SAL_t : Compensation to employees in year t	IN_t : index of number employed in year t				
IH_t : index of number of hours worked in year t	IH_t^* : index of number of hours worked in year t adjusted for change in labour productivity				