Single or double deflactors

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Methods of Estimating GVA at Constant-Price

Theoretically, double indicator methods are generally superior.

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Main double Indicator Methods

Double Deflation:
$$Y_t / IPY_t - C_t / IPC_t$$

Double Extrapolation:
$$Y_0 \times IVY_t - C_0 \times IVC_t \text{ , } using$$
volume index as extrapolator

Extrapolation-Deflation combination:
$$Y_0 \times IVY_t - C_t / IPC_t$$
$$\text{or} \quad Y_t / IPY_t - C_0 \times IVC_t \text{ } using \text{ } volume$$
index as extrapolators

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Main single Indicator Methods

Direct deflation by price index of output:
$$VA_t / IPY_t$$

Direct deflation by price index of input:
$$VA_t / IPC_t$$

Direct Extrapolation by gross output volume index:
$$VA_0 \times IVY_t$$

Direct deflation by wage rate index:
$$VA_t / Iw_t$$

Direct extrapolation by an index of numbers of workers :
$$VA_0 \times IN_t$$

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Practical problems of using double indicator methods

- More demanding in terms of data

- When GVA is a small portion of output and when the relative prices change drastically, the <u>double indicator</u> method sometimes gives erratic result (*even negative value added*)

- Thus, <u>double indicator</u> methods are **not** uniformly recommended.

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Method for controlling the erratic result

- Y_t and C_t can be decomposed

- $Y_t = IPY_t * Qo_t$; $C_t = IPC_t * Qi_t$

- Where Qo_t and Qi_t are the unobserved quantities of output and input.

- We focus our attention on the ratio

$$C_t / Y_t = (IPC_t * Qi_t)/ (IPY_t * Qo_t)$$

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Method for controlling the erratic result

➢ The dynamic of the ratio is

$$(C_t / C_{t-1})/(Y_t / Y_{t-1}) =$$

$$\frac{(IPC_t * Qi_t)/(IPC_{t-1} * Qi_{t-1})}{(IPY_t * Qo_t)/(IPY_{t-1} * Qo_{t-1})}$$

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Method for controlling the erratic result

➢ Hyp: the "unobserved" Qi can not undergo sharp fluctuations in the short term as it depends on the production technology.

➢ We can, therefore, impose the condition

$$-n\sigma \leq \frac{IPC_t / IPC_{t-1}}{IPY_t / IPY_{t-1}} \bigg/ \frac{C_t / C_{t-1}}{Y_t / Y_{t-1}} \leq n\sigma \ [1]$$

Where σ is a standard deviation calculated on time series or cross section data and n is a subjective parameter.

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Method for controlling the erratic result

- If the condition [1] is not verified we correct IPC so as to place the difference [1] corresponding to the extreme of the range considered (± nσ).

- The correction is performed on the IPC as it is not directly observed.

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The end

- **Thank you for your kind attention**

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