Productivity Adjustment Factors for Labor

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Agenda

1. Why adjust for productivity?
2. Construction in ICP 2011
3. ICP 2011 methodology for public services
4. ICP 2011 implementation and modification
Proposals for ICP 2017

A. Maintain current practice in construction of relying solely on input prices for most regions and regional linking.

B. Maintain the methodology but change the implementation of the productivity adjustment for public services.
Principle of productivity adjustment

• ‘Comparison-resistant areas’: no good measures of (output) prices, hence measurement of input prices
  – Relevant for Construction and public services (general government, public health, public education)
• Input prices are only appropriate measures of output prices in the absence of productivity differences
  – Otherwise, a productivity adjustment is necessary
• Second-best solution!
  – First-best solutions for some areas in Eurostat-OECD PPP program
Construction in ICP 2011

• Collection of:
  – Wages of construction workers
  – Prices of building materials
  – Rental rates for machinery

• Combined into overall construction input price using cost shares

• First-best (Eurostat-OECD): pricing of (model) construction projects
  – Could be different from input price due to differences in (total factor) productivity (TFP) and markups of price over marginal costs
Evaluation of ICP 2011 approach

1. 10 Eurostat-OECD countries collected input prices (for GCL) and output prices
   – Data for AUS, CAN, DNK, FIN, GBR, HUN, NLD, PRT, RUS, USA
2. Adjust input prices for economy-wide TFP differences (source: Penn World Table, version 9.0)
3. Compare input and adjusted input prices to observed output prices
Construction productivity adjustment in OECD/Eurostat

- Productivity-adjusted input prices are not systematically closer to observed output prices
- Unclear what productivity adjustment would be feasible and satisfactory
- No clear systematic bias (in this group of countries) from relying on relative input prices

Note: Input prices are adjusted for economy-wide productivity differences
Collection of:
- Wages of public servants, medical workers, teachers

Wages differ from output prices due to:
- TFP differences
- Differences in capital intensity

No adjustment for TFP differences, only for capital intensity
ICP 2011 productivity adjustment factors

\[ P_i = \frac{1}{2} (\alpha_i + \bar{\alpha}) \log \left( \frac{k_i}{k} \right) \]

\[ F_{i,b} = (e^{P_i - P_b})^{-1} \]

\[ \overline{PPP}_{i,b} = PPP_{i,b} \times F_{i,b} \]

Practical implementation: round PAFs to nearest 0.5 or 0.
Implementation in ICP 2011

• Capital/worker data based on Penn World Table (version 8.1)
• $\alpha_i = 1 - \text{Labor share (v8.1)}$
Proposed implementation ICP 2017

• Capital/worker data based on Penn World Table (version 9.0)
  – More national source used for estimating capital
  – Data until 2014 (2017 data available by mid-2019)

• \( \alpha_i = 1 \) – Labor share – Resource rents (v9.0+WDI)
PAF comparison for 2011

Productivity adjustment factors, USA=1

Smaller adjustment factors, due to:
- Better capital data &
- Better capital share data
A. *Maintain current practice in construction* of relying solely on input prices for most regions and regional linking.

B. *Maintain the methodology but change the implementation* of the productivity adjustment for public services.

Ad B: Revising the ICP 2011 PPPs based on the new PAF implementation would enhance the time series consistency between ICP 2011 and ICP 2017.