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# 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

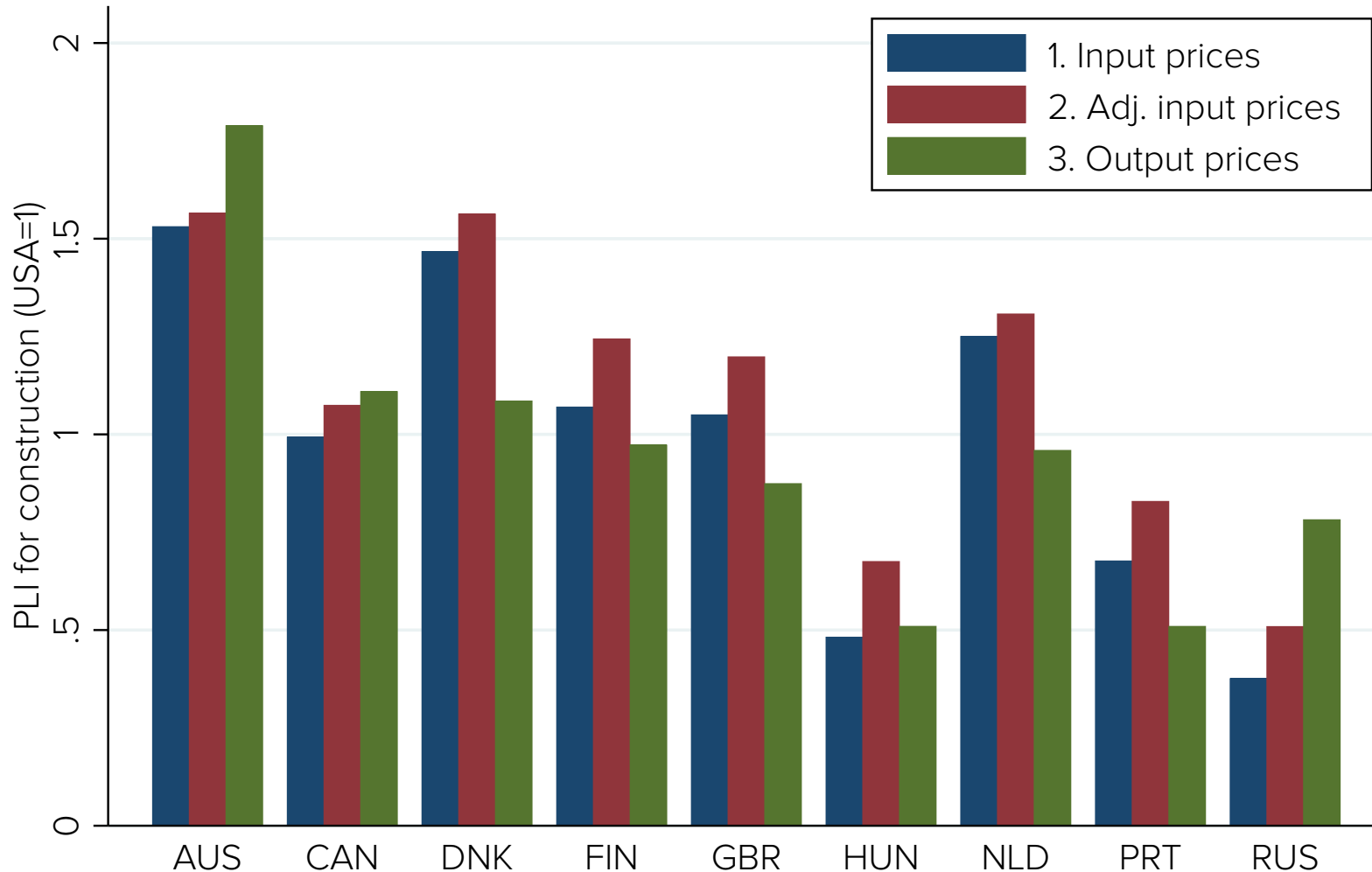
# Construction in ICP 2011

- 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



Note: Input prices are adjusted for economy-wide productivity differences

- 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

# Public services in ICP 2011

- 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

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

$$F_{i,b} = (e^{P_i - P_b})^{-1}$$

$$\widetilde{PPP}_{i,b}^W = PPP_{i,b}^W \times F_{i,b}$$

Practical implementation: round PAFs to nearest 0.5 or 0.

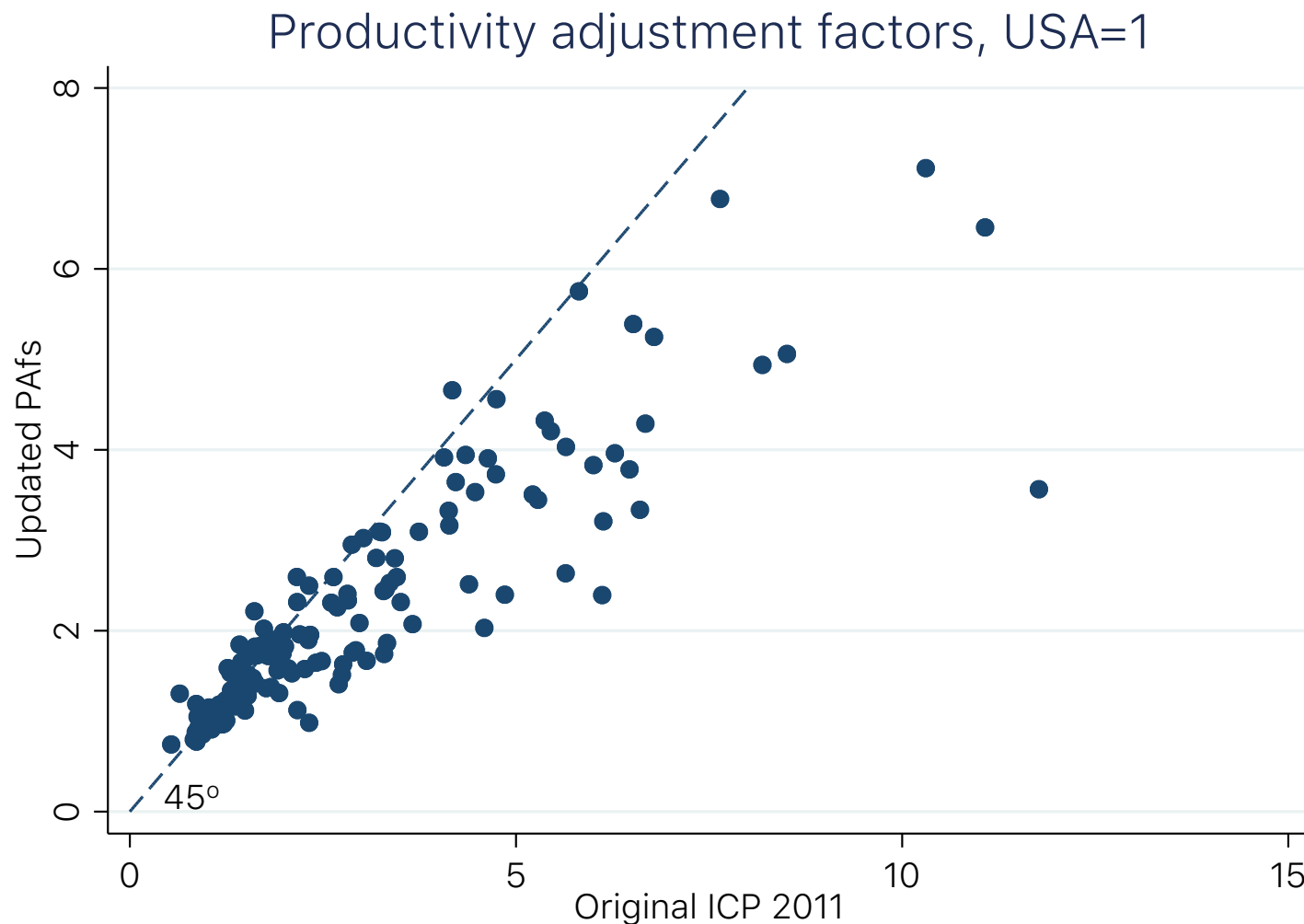
# Implementation in ICP 2011

- 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)
- $\alpha_i = 1 - \text{Labor share} - \text{Resource rents}$  (v9.0+WDI)

# PAF comparison for 2011



Smaller adjustment factors,  
due to:

- Better capital data &
- Better capital share data

# 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.*

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