Revised Productivity Adjustment Factors and Potential Impact

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TAG Meeting
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Agenda

1. ICP 2011 methodology for public services
2. ICP 2011 implementation and modification
3. Impact of modified computation for ICP 2011 GDP PPPs
Approach

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.

ICP 2011

A. Revise PPPs based on the revised PAFs for 2011
ICP 2011 productivity adjustment factors

Key ingredients: capital stock/worker $k_i$ and their estimated contribution to labour productivity $\alpha_i$

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

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

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

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)
• $\alpha_i = 1 - \text{Labor share (v8.1)}$
Implementation ICP 2017 and revision ICP 2011

- Capital/worker data based on Penn World Table (version 9.1)
  - More national source used for estimating capital
  - Data until 2017

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

- Also: National Accounts revisions
Productivity Adjustment Factors for 2011 (USA=1)

Smaller PAFs, due to:
- Better capital data &
- Better capital share data
Revising the ICP 2011 PPPs

- Impact on regional linking factors
- No impact on PPPs within Eurostat-OECD, CIS or Western Asia
- Impact on PPPs within Africa, Asia-Pacific, Latin America and Caribbean, Singletons ⇒ 112 countries
  - 38 out of 112 show no change in PAF (up to the rounding to .5 and .0)
Regional summary

Table 1. Revision of GDP PLIs (USA=1), average and standard deviation by region of PLI(revised)/PLI(original)

<table>
<thead>
<tr>
<th>Region</th>
<th>Average</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eurostat-OECD</td>
<td>1.000</td>
<td>0</td>
</tr>
<tr>
<td>CIS</td>
<td>1.000</td>
<td>0</td>
</tr>
<tr>
<td>Western Asia</td>
<td>1.013</td>
<td>0</td>
</tr>
<tr>
<td>Africa</td>
<td>0.970</td>
<td>0.025</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>0.987</td>
<td>0.019</td>
</tr>
<tr>
<td>Caribbean</td>
<td>0.983</td>
<td>0.027</td>
</tr>
<tr>
<td>Latin America</td>
<td>0.989</td>
<td>0.020</td>
</tr>
<tr>
<td>Singleton</td>
<td>1.021</td>
<td>0.009</td>
</tr>
</tbody>
</table>

- Average change of PAF: –12%
- Average share of wages in GDP: 8.6%
- Average GDP PPP revision: –1.2%
Revision by country

<table>
<thead>
<tr>
<th>Category</th>
<th># of countries</th>
<th>Average revision</th>
<th>Revision range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant PAF</td>
<td>35</td>
<td>0</td>
<td>[-0.6, +2.7]</td>
</tr>
<tr>
<td>Higher PAF</td>
<td>5</td>
<td>+2.5</td>
<td>[+1.4, +3.5]</td>
</tr>
<tr>
<td>Lower PAF</td>
<td>72</td>
<td>-3.5</td>
<td>[-10.7, -0.2]</td>
</tr>
</tbody>
</table>
Preliminary 2017 PAFs

• Available: extrapolated investment PPPs + capital stocks, employment & labor shares (PWT 9.1) + resource rents (WDI)
  – Main missing data item: investment (GFCF) PPPs from ICP 2017

• Change in PAF from 2011 to 2017:

<table>
<thead>
<tr>
<th></th>
<th># of countries</th>
<th>Change PAF</th>
<th>Growth K/L</th>
<th>Growth GDP/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant PAF</td>
<td>123</td>
<td>0</td>
<td>1.4</td>
<td>0.8</td>
</tr>
<tr>
<td>Higher PAF</td>
<td>39</td>
<td>0.7</td>
<td>–0.1</td>
<td>–0.1</td>
</tr>
<tr>
<td>Lower PAF</td>
<td>9</td>
<td>–0.6</td>
<td>5.2</td>
<td>2.5</td>
</tr>
</tbody>
</table>
Conclusions

• Revising PAFs for ICP 2011 leads to revisions to GDP PPPs that are predictable and modest in size
• Changes in PAFs between 2011 and 2017 are typically modest
  – And changes match differences in country growth performance