Deflation of SUTs in the Czech practice

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Czech practice in constant price calculations

- GDP trends are based on SUTs calculations:
  - in ANA – directly using deflating SUTs
  - in QNA – indirectly using structures from SUTs

- All revisions of GDP are carried out using SUTs - the CZSO has a long time series of methodically comparable SUTs at current and constant prices (since 1990, 1970)

- SUTs in constant prices are compiled by deflating SUTs at current prices - the procedure is in both versions (Excel files or SNA-NT) very similar

- For each product can be more price indices (PPI, CPI, price index of import/export)
Deflation of supply table (1)

- Output matrix
  - Non-market output
    - Input method
  - Market output for domestic use
    - PPI (CPI, index of average wage, index of import adjusted to exchange rate)
  - Output for export
    - Price indices of export
  - Specific outputs (for own use, FISIM, imputed outputs, …)
    - Specifically elaborated deflators
Deflation of supply table (2)

Export
- Export of other goods, other services
  - price index of export
- Reexport
  - as trade margins
- Non-residents purchases
  - as HFCE (in bp + valuation matrices)
- Processing
  - producer price index
- Export of merchanting
  - indices for merchanting
Deflation of use table (1)

- Intermediate consumption (IC)
  - Purchasers’ prices
  - Valuation types (VAT, margins, taxes, subsidies) – deflated separately
  - IC at basic prices:
    - IC from import – deflated by import price index
    - Domestic IC – deflated by PPI

<table>
<thead>
<tr>
<th>Current prices</th>
<th>Constant prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchasers' prices</td>
<td>=</td>
</tr>
<tr>
<td>- VAT</td>
<td>+</td>
</tr>
<tr>
<td>- trade margin</td>
<td>+</td>
</tr>
<tr>
<td>- transport margin</td>
<td>+</td>
</tr>
<tr>
<td>- subsidies on products</td>
<td>+</td>
</tr>
<tr>
<td>- taxes on products</td>
<td>+</td>
</tr>
<tr>
<td>= basic prices</td>
<td></td>
</tr>
</tbody>
</table>

(1)
Deflation of use table (2)
Deflation of valuation matrices

- **Taxes on product**
  - Taxes on product at constant prices:
    \[ T_{CP} = rate_{t-1} * base_{CP} \]
    where
    \[ rate_{t-1} \] is rate of taxes in previous year
    \[ base_{CP} \] is base of taxes (at basic prices) at constant prices

- **Deflator** = taxes at current prices divided by taxes at constant prices
Deflation of use table (3)

Deflation of valuation matrices

- Subsidies on product
  - Subsidies on product at constant prices:
    \[ S_{CP} = rate_{t-1} \times base_{CP} \]
    where
    - \( rate_{t-1} \) is rate of subsidies in previous year
    - \( base_{CP} \) is base of subsidies (at basic prices)
    at constant prices

- Deflator = subsidies at current prices divided by subsidies at constant prices
Deflation of use table (4)

Deflation of valuation matrices

- Trade margin (TM)
  - Trade margin on product at constant prices:
    \[ TM_{CP} = rate_{t-1} \times base_{CP} \]
    where
    - \( rate_{t-1} \) is rate of TM in previous year
    - \( base_{CP} \) is base of TM (basic prices + taxes) at constant prices

- Deflator = TM at current prices divided by TM at constant prices

- Transport margin – same method
Deflation of use table (5a)

Deflation of valuation matrices

- VAT
  - Each product – rate of VAT
  - Each industry (IC, GFCF) – ratio of payers and non-payers
  - VAT at constant prices:

\[ VAT_{CP} = rate_{t-1} \times s_{t-1} \times base_{CP} \]

\[ s = \frac{\text{revenues of non-payers}}{\text{revenues of non-payers} + \text{revenues of payers}} \]
Deflation of use table (5b)

*Deflation of valuation matrices*

where

\[ \text{rate}_{t-1} \]

is rate of VAT in previous year

\[ s_{t-1} \]

is ratio of VAT non-payers in previous year

\[ \text{base}_{CP} \]

is base of VAT (basic prices + taxes + trade margin + transport margin) at constant prices

- Deflator = VAT at current prices divided by VAT at constant prices
Deflation of use table (6)

■ GFCF
  ➢ Approach is same as for intermediate consumption:
    ❖ Transfer from purchaser’s prices to basic prices
    ❖ GFCF from import – deflated by import price index
    ❖ Domestic GFCF – deflated by PPI
    ❖ Matrix approach

■ Acquisitions less disposals of valuables
  ➢ Deflated by PPI

■ Changes in inventories
  ➢ Deflated by PPI
Deflation of use table (7)

- Household final consumption expenditure (HFCE)
  - Purchasers’ prices
  - National concept (domestic consumption + residents abroad)
  - Adjusted to self-supply → deflated by PPI
  - Matrix COICOP 4 x CPA 3
  - Deflation of FHCE outside SUT
Deflation of use table (8)

- Matrix COICOP x CPA at current prices

<table>
<thead>
<tr>
<th>CPA 3</th>
<th>COICOP 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>0111</td>
</tr>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>011</td>
<td></td>
</tr>
<tr>
<td>012</td>
<td>100</td>
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<tr>
<td>014</td>
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<tr>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>950</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
</tr>
</tbody>
</table>

- Deflated by CPI
Deflation of use table (9)

- Consumption of residents abroad – CPI of foreign countries adjusted to exchange rate
- Implicit deflator of HFCE at CPA is implemented to SUT

Consumption expenditure of government and non-profit institutions
  - Non-market output → input method
  - Social transfers in kind via market producers (STK)
    - Transfer from purchaser’s prices to basic prices
    - STK from import – deflated by import price index
    - Domestic STK – deflated by PPI
Deflation of use table (10)

- Import
  - Import of other goods, other services, processing, merchanting, re-export
    - price index of import
  - Consumption of residents abroad
    - CPI of foreign countries adjusted to exchange rate
The SUTs system automatically provides deflation to the previous year prices:

- In both files each sheet in current prices \((cur)\) has parallel sheet in previous year prices \((pyp)\).
- Special sheet with needed price indices is included in both files. (If direct price indices are not in disposals they must be elaborated or replaced by another.)
- The recalculation is running automatically \(\Rightarrow\) final SUTs in \(pyp\) is automatically balanced (small corrections are allowed due to use of two methods for HFCE)
Thank you for your attention