Volume indices for all economic sectors
In the last 30 years or so, service industries have become increasingly important. Often outweigh industrial activities now. Partly result of:
- strong growth in services per se
- different classification
- recording of different production arrangements
  - Choice of statistical unit
Industry vs. service indices

- The basic approach to calculating the index in different industries remains the same
- Calculation should be done at 4-digit industry level (and higher)
- For practical reasons, Laspeyres index is recommended
  - Has many of the desired characteristics of index numbers
Industry vs. service indices

- Volume extrapolation has been used as primary method for industrial sector in the past
- Prices can be assigned to each of the produced products (linked to physical output)
Volume extrapolation possible since physical outputs can be measured in mostly straightforward ways and units

- Number (count)
- Tons
- Square meters
- Etc.

(for each detailed, well defined product)
Industry vs. service index

- Still, problems exist for some industries in using such easy approaches:
  - When production spreads of many time periods
  - When selection of small sets of characteristic products is difficult
- Deflation works very well in some of these cases, if an appropriate deflator exists
Industry vs. service indices

▪ For service industries, easy quantifications don’t exist

▪ What can be used?
  ▪ Depends very much on the industry
    ▪ E.g. passenger-kilometers for transport

▪ However, deflation method usually works better, if a suitable deflator exists
  ▪ The type of deflator available usually changes by industry
Preferred approaches

▪ The question remains: What is the most appropriate method for each industry and what data should be used for it?
▪ This has been addressed in the latest recommendations on index numbers:
  ▪ IRIIP 2010, chapter 6
  ▪ ISP Manual 2007, Annex 1 and 2
<table>
<thead>
<tr>
<th>ISIC class</th>
<th>Description</th>
<th>Explanatory notes</th>
<th>Products or product groups</th>
<th>Preferred method</th>
<th>Alternative method</th>
<th>Other methods</th>
</tr>
</thead>
</table>
| 3011       | Building of ships and floating structures | This class includes the building of ships, except vessels for sports or recreation, and the construction of floating structures | - Passenger vessels, ferry boats, cargo ships, tankers, tugs  
- Warships  
- Fishing boats and fish-processing factory vessels  
- Floating docks, pontoons, cofferdams, floating landing stages, buoys | Volume indicator (input-based)  
Number of hours worked adjusted for changes in productivity | Volume indicator (input-based)  
Number of persons employed adjusted for changes in productivity | Deflated indicator  
Value of raw material consumption (major materials) used in production deflated by appropriate quality-adjusted PPI |
| 3012       | Building of pleasure and sporting boats | This class includes:  
- manufacture of inflatable boats and rafts  
- building of sailboats with or without auxiliary motor  
- building of motorboats | - Inflatable boats and rafts  
- Canoes, kayaks, rowing boats, skiffs  
- Motorboats  
- Sailboats | Volume indicator (output-based)  
Quantity (count) of products produced, by product or  
Volume indicator (input-based)  
Number of hours worked adjusted for changes in productivity | Volume indicator (input-based)  
Value of output deflated by appropriate quality-adjusted PPI | Volume indicator (input-based)  
Number of persons employed adjusted for changes in productivity |
## Recommendation of deflator by ISIC

<table>
<thead>
<tr>
<th></th>
<th>CPI</th>
<th>PPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>None</td>
<td>Consultancy (hardware; software)</td>
</tr>
<tr>
<td>721</td>
<td>Software packages</td>
<td>Software (publishing; consultancy; production; maintenance)</td>
</tr>
<tr>
<td>722</td>
<td>None</td>
<td>Data processing; operation of data processing facilities</td>
</tr>
<tr>
<td>723</td>
<td>Internet services</td>
<td>Database service; online publishing</td>
</tr>
<tr>
<td>724</td>
<td>None</td>
<td>Maintenance of (computing equipment; photocopiers; other office machinery)</td>
</tr>
<tr>
<td>725</td>
<td>None</td>
<td>Computer disaster recovery; software installation services</td>
</tr>
<tr>
<td>729</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

Note: This is still ISIC Rev.3
Preferred approach

<table>
<thead>
<tr>
<th>722</th>
<th>Software publishing, consultancy and supply</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Includes</td>
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<tr>
<td></td>
<td>7221 - Software publishing and documentation of ready-made software</td>
</tr>
<tr>
<td></td>
<td>7229 - Other software consultancy and supply</td>
</tr>
<tr>
<td></td>
<td>i.e. analysis, design and programming of custom software, software maintenance and web page design</td>
</tr>
<tr>
<td></td>
<td>Excludes reproduction of software and retail sale of non-customerised software</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Gross turnover deflated by appropriate quality adjusted price indices</th>
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</thead>
<tbody>
<tr>
<td>Turnover from survey of software publishers and software consultants or administrative data taken from tax returns which could be split by type of software consultancy activity</td>
</tr>
<tr>
<td>Examples are:</td>
</tr>
<tr>
<td>- Software publishing</td>
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<tr>
<td>- Software consultancy</td>
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<tr>
<td>- Production of made-to-order software</td>
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<tr>
<td>- Software maintenance</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Weighted appropriate price indices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples are:</td>
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<tr>
<td>- CPI: Software packages</td>
</tr>
<tr>
<td>- PPI: Software publishing</td>
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<tr>
<td>- PPI: Software consultancy</td>
</tr>
<tr>
<td>- PPI: Software production</td>
</tr>
<tr>
<td>- PPI: Software maintenance</td>
</tr>
</tbody>
</table>

Note: This is still ISIC Rev.3
Manual for index of service production 2007

Alternative and other approach

Gross turnover deflated by partially representative price indices
Turnover from survey of software publishers and software consultants or administrative data taken from tax returns
Deflated by partially representative PPIs or a general price index
Or
Volume indicators
Examples are:
- Number of software licences sold
- Number of programming hours
- Number of billable hours

Volume indicators
Examples are:
- Employment

Note: This is still ISIC Rev.3
Preferred approaches

- Both manuals provide a comprehensive set of detailed recommendations for compiling indices for all economic sectors
  - Includes also retail trade

- UNSD – International Recommendations for the Index of Industrial Production (IRIIP) 2010
- OECD – Compilation Manual for an Index of Service Production 2007

- Feedback on applied methods is always appreciated
Thank You