Measuring EU value added embodied in EU foreign exports by consolidating 27 national SUTs for 2000-2007

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The literature: how to consolidate?

1. **Non-survey**: estimate margins of IOT & use RAS or CRAS; **not** for EU27 with abundant SUT & IOT data

2. **Survey**: estimate international IOT from national IOTs & international trade data; repricing bilateral import block matrix with c.i.f. prices to balance with exports block column with f.o.b. prices

3. **Future**: start with national SUTs, **not** with IOTs

4. **Our method**: do **not** estimate a full intercountry SUT; only needs data intra-EU vs. Extra-EU trade
Overview of consolidation method

1. **Simple sum** of 27 harmonised Domestic Use tables in **basic prices**; 27 intra-EU Import tables + 27 extra-EU Import tables in c.i.f. prices

2. **Re-estimation** of crude EU27 **Import** table from c.i.f. prices into basic prices, correction of re-exports = **core step** of construction process

3. **Add** domestic and new intra-EU import use table

4. **Simple sum** of 27 harmonized **Supply** tables
## Crudely consolidated EU27 Use table

<table>
<thead>
<tr>
<th>Domestic intermediate use</th>
<th>Domestic final use</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intra-EU intermediate imports</strong></td>
<td>Intra-EU final imports</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>Extra-EU intermediate imports</strong></td>
<td>Extra-EU final imports</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>TLS</td>
<td>TLS</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

**Red part of table should disappear**

1: Exports to intra-EU countries
2: Exports to extra-EU countries
3: Re-exports, imported from intra-EU, exported to intra-EU
4: Re-exports, imported from intra-EU, exported to extra-EU
5: Re-exports, imported from extra-EU, exported to intra-EU
6: Re-exports, imported from extra-EU, exported to extra-EU
7: Taxes less subsidies on products (TLS) on intra-EU exports
8: Taxes less subsidies on products (TLS) on extra-EU exports
7 = deduct TLS on intra-EU imports

3 = Italian shoes via Austria to Czechia, OK
4 = Italian shoes via Austria to Swiss, not OK

<table>
<thead>
<tr>
<th>Domestic intermediate use</th>
<th>Domestic final demand</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-EU intermediate imports</td>
<td>Intra-EU final imports</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Extra-EU import use</td>
<td>Extra-EU import for final demand</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Adjusted TLS | Adj. TLS | 8
5 = Swiss chocolate via France to Spain, not OK

Re-scale total of intra-EU imports to total of intra-EU exports, +10%

Re-price import rows to 1
Test: GDP embodied in EU27 exports

- All SUTs => industry-by-industry IOTs with **industry technology** assumption *
  **industry market shares** in domestic supply

- **Decomposition** of embodied GDP with national SUTs

- **Domestic GDP impacts:** $\sum_r \hat{c}^r (I - A^{rr})^{-1} e^r$

- **1st order spillovers:** $\sum_r \hat{c}^r A^{er} (I - A^{rr})^{-1} e^r$

- **Total, incl. feedbacks:** $\sum_r \hat{c}^r (I - A^{rr} - A^{er})^{-1} e^r$
Decomposition of consolidation errors

› Unbiased value added specification error: domestic, spillover and feedback effects are all done with national \( \hat{c}^r \)

› Unbiased aggregation error: the above effects could have been made with the crudely consolidated SUT

› Underestimation of extra-EU exports: -12.4%

› Rescaling intra-EU imports: TLS -0.25%, Shoes to Swiss -11.6%, chocolate to Spain +9.6%, remaining gap with exports +10%; Repricing with GRAS
Errors in embodied VA of EU-exports

Errors in embodied VA of EU-exports include:
- Error in factor coefficients (v2a)
- Error from aggregation (v2b)
- Error of non-correction of extra-EU exports (v2c)
- Error of non-correction of intra-EU imports (v2d)
- Error of not consolidating (v2)

Percentage of total

Year

2000 2001 2002 2003 2004 2005 2006 2007
Summary of empirical outcomes

› All % are large, as such, and because the direct impact of EU-exports on EU-value added is included (an IO model not needed to estimate that)

› A crudely consolidated SUT, and thus the IOT, has large errors due to not correcting intra-EU trade

› Behind the large aggregate EU27 errors even larger errors of ±50% are found at the 59 industry level
Conclusion and discussion

› Even with the 27.2% underestimation removed, EU27 exports to third countries contribute only a meager 11.2% to EU27 GDP

› Thus: internal market efficiency and innovativeness could well be far more important than external competitiveness!