Charging and pricing in the area of inland waterway transport

Presentation ECMT Seminar - session “Leveling the playing field”

Jeroen Bozuwa, ECORYS NL
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Background

White Paper:

• Charging for infrastructure to increase efficiency and sustainability of transport system.

• Economic Theory: charging policies are most effective if based on marginal costs.

• Need for a practicable, transparent and applicable methodology for cost registration and allocation.
Research (theory)

Marginal infrastructure costs:

• Econometric approach: theoretically preferred (objective evidence of cost causation), however too complicated and not practicable (high quality data, demanding level of detail and long time periods).

• Engineering approach: based on technical relations; not practicable because of huge detail of (technical) data demand; lack of technical knowledge on transport demand and actual cost levels.

• Cost allocation approach: starts with cost registration, tries to split relevant costs into fixed and variable; less detail for cost information necessary.
Research (cost allocation)

Recent studies in the Netherlands:

- Total IW Infrastructure and maintenance costs (excluding building and construction) estimated at EUR 247 million / year;
- To be allocated to IWT (partly): dredging, operation of locks/bridges, river police, maintenance and management on inland ports;
- Roughly EUR 100 – 165 million / year to be allocated to IWT.

<table>
<thead>
<tr>
<th>Vessel size (loading capacity in tons)</th>
<th>Euro per vehicle kilometre</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 650 ton</td>
<td>0,60</td>
</tr>
<tr>
<td>650-1000 ton</td>
<td>1,20</td>
</tr>
<tr>
<td>1000-1500 ton</td>
<td>2,40</td>
</tr>
<tr>
<td>1500-3000 ton</td>
<td>3,60</td>
</tr>
<tr>
<td>&gt; 3000 ton</td>
<td>4,80</td>
</tr>
</tbody>
</table>

Source: NEA, 2001
Research (cost allocation)

Recent studies in the Netherlands:

- More recent study (CE, 2004) used cost allocation, distinguishing fixed and variable costs;
- Variable costs include: traffic control (buoying, signalling), patrol vessels and crew, operational costs (locks and bridges);
- Approximately EUR 29 million can be allocated to freight vessels, resulting in average costs of EUR 0.53 / vessel-km;
- Also including fixed costs would have resulted in average costs of in between EUR 1.95 / vessel-km (smallest ship) and EUR 8.64 / vessel-km (largest ship).
Research (case studies)

*Development of practical guidelines to calculate marginal costs using cost allocation:*

- Case studies performed in 2004/2005 (by ECORYS/Mettle)
- Specific waterway sections in Germany, France and the Netherlands

<table>
<thead>
<tr>
<th>Case study</th>
<th>Country</th>
<th>Accessibility (Tonnes)</th>
<th>Infrastructure characteristics</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amsterdam-Rhine Channel</td>
<td>NL</td>
<td>VIb (6400-12000)</td>
<td>Many bridges, locks</td>
<td>73 km</td>
</tr>
<tr>
<td>IJsselmeer + Northern Canals</td>
<td>NL</td>
<td>Va (1500-3000)</td>
<td>Lake, free flowing and smaller canals with locks and bridges</td>
<td>74 km</td>
</tr>
<tr>
<td>Basin Rhone-Saone</td>
<td>F</td>
<td>Va (1500-3000)</td>
<td>Many locks (126)</td>
<td>860 km</td>
</tr>
<tr>
<td>Danube</td>
<td>A</td>
<td>1500 up to 6000 tons</td>
<td>Free flowing river</td>
<td>350 km</td>
</tr>
<tr>
<td>Main-Danube Channel</td>
<td>D</td>
<td>VIa-c (3200-18000)</td>
<td>Canal</td>
<td>170 km</td>
</tr>
</tbody>
</table>

Source: ECORYS, 2005
Research (case studies)

- Step 1: perform logical data checks on infrastructure expenditures in order to arrive at real costs of infrastructure (i.e. correction for backlog in maintenance, dredging, change of registration methods, reservations).
- Step 2: depending on cost category, allocate % of total infrastructure costs to inland shipping (71-80% in case studies).
- Step 3: assess share of variable costs = cost which vary with the number of ships (15-28% in the Dutch case studies).
- Step 4: assess share of variable costs to be allocated to:
  a) freight
  b) other vessels
- Step 5: Calculate user-dependent (marginal) infrastructure costs / vessel-km
Research (case studies)

Case study results: user-dependent costs for freight vessels per waterway

<table>
<thead>
<tr>
<th>Waterways</th>
<th>CEMT</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amsterdam-Rhine Channel (NL)</td>
<td>Vlb (6400-12000)</td>
<td>€ 1,14</td>
<td>€ 1,15</td>
</tr>
<tr>
<td>Prinses Margriet Channel (NL)</td>
<td>Va (1500-3000)</td>
<td>€ 0,27</td>
<td>€ 0,45</td>
</tr>
<tr>
<td>Van Starkenborgh Channel (NL)</td>
<td>Va (1500-3000)</td>
<td>€ 0,67</td>
<td>€ 0,91</td>
</tr>
<tr>
<td>Basin Rhone-Saone (F)</td>
<td>1500 up to 6000 tons</td>
<td>€ 0,06</td>
<td>€ 0,50</td>
</tr>
<tr>
<td>Danube – Austria (A)</td>
<td>Vla-c (3200-18000)</td>
<td>€ 0,14</td>
<td>€ 0,18</td>
</tr>
<tr>
<td>Main-Danube Channel (D)</td>
<td>Vb (3200-6000)</td>
<td>€ 2,45</td>
<td>€ 3,31</td>
</tr>
</tbody>
</table>

Source: ECORYS, 2005
Conclusions

• Econometric and engineering approach are not practicable and too complicated because of huge data demand (high quality data over long time periods).

• Cost allocation approach is best solution from practicable and transparent point of view.

• Cost allocation still requires thorough analysis and good quality data.
Actions required

- Introduce a uniform method of cost-registration (revival of Regulation 1108/70).

- Increase the number of case studies/countries in order to get a sound understanding of national practices on infra expenditures and costs registration.

- Monitor the degree of backlogging of maintenance costs in order to compensate for this.

- Further improve and apply the cost allocation methodology in order to get the prices right.