Marginal Cost Pricing under Cost Recovery Constraints

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Application form for the train-path-application-form
Infrastructure ÖBB

- Train-Paths
- Stations
- Shunting
- Parking
- Pre-Heating

Whatever you need!

All network open!
All tracks available!
All languages spoken!

It’s a business!
Chain of Value-added

- End-customers
- Travel agents
  - Forwarding agents
  - Organization of a transport service
- Train-operators
  - Execution of rail-transports
- Network-operator
  - Allocation of infrastructure capacities
- Technical infrastructure-services
  - Maintenance of infrastructure assets
  - Building of infrastructure

ÖBB-Infrastructure
Regulations specified in EU-Directive 01/14

Minimum Access Package:

- Charges should be set at the costs directly incurred from running the additional train (marginal costs)

- Mark-ups permitted for bottlenecks and for specified investment projects

- Further mark-ups in order to achieve a higher rate of cost-recovery where the market can bear them

- There may be an element to cover uncompensated external costs, in case such an element is not in place at competing modes, revenues from that title have to be transferred directly to the state budget

Other services:

- Cost recovery is the target, the competitive situation of railway traffic has to be taken care of in certain cases
Financing of Railways throughout Europe

RAIL SYSTEM

- Train Operating Companies
- Infrastructure-managers

State-budget

Infrastructure-charges
Infrastructure Charges international (1)

1000t-Freight train, most expensive line

in €/km

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Infrastructure Charges international (2)

Commuter Train to Capital City

in €/km

S  DK  CH  CZ  A  SK  P  D  H
Infrastructure Charges international (3)

Conventional Express Train

in €/km

0 1 2 3 4 5

DK S CH CZ P SK A H D
Infrastructure Charges international (4)

30 t Diesel Motor Unit, Cheapest Line

in €/km

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Why Marginal Costs make Sense

- Managing railway infrastructure is a business with a tremendous share of fixed costs

- To recover costs, the infrastructure-manager has to look for contributions from various kinds of traffic, i.e. market-segments of the infrastructure

- Various market segments feature various abilities to pay

- But the bottom-line is marginal costs! Anything sold below marginal-costs is a loss.

- There are lots of examples from other industries with similar cost-structures, e.g. airlines, refineries, …
Cost Recovery – a simple Example

• Suppose the IM has to recover costs of 90

• There are three potential customers, one is able to pay 50, the second 30, the third 20, which makes a revenue potential of 100

• Suppose the IM sets the price at 30, then one customer breaks away the remaining customers would have to pay 45, so they next customer is unable to pay which would leave the last customer with a burden of 90 which is unaffordable

<table>
<thead>
<tr>
<th>Willingness to pay</th>
<th>Revenue at general price at 30</th>
<th>Revenue at general price at 45</th>
<th>Revenue at general price at 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer A</td>
<td>50</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>Customer B</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Customer C</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Total              | 100                           | 60                            | 45                            | 0
Solutions in Austria
Progress at Liberalization in Austria

2001: Start of Third-Party-Access

- DB Regio AG (Tyrol)
- VÖEST (bulk cargo for steel mill)

2004: Liberalization in Progress:

- 10 domestic railway undertakings
- 4 foreign railway undertakings additionally on our network
Restructuring of ÖBB

Federal Republic of Austria

ÖBB Holding AG

ÖBB Dienstleistungs GmbH
Services for other ÖBB-companies at personnel administration

ÖBB Personenverkehr AG
Passenger traffic

ÖBB Traktion GmbH

ÖBB Technische Services GmbH

ÖBB Cargo Austria AG
Freight traffic

ÖBB Traktion GmbH

ÖBB Technische Services GmbH

ÖBB Infrastruktur Betrieb AG
Network Operations
Maintenance and renewal
Timetabling
Shunting
Capacity allocation
Charging

ÖBB Infrastruktur Bau AG
Construction of new infrastructure

Brenner Eisenbahn GmbH

ÖBB Immobilien Management GmbH
Financing of ÖBB-Infrastructure

Federal Republic

Infrastruktur-Bau-AG

Infrastruktur-Betriebs-AG

Rent

Contribution acc. to § 43 of law on restructuring ÖBB

6-year-contract for finance and service

Contribution acc. to § 42 of law on restructuring ÖBB

Minimum Access Package

Other Access Services

Additional Services

Products and Revenue of ÖBB-Infrastructure

ÖBB-Personenverkehrs-AG

Rail Cargo Austria AG

Other Train Operating Companies

Customers of ÖBB-Infrastructure

Public Service Contracts

Quelle: ÖBB-Infrastruktur, © Garstenauer
Product-Packages of ÖBB-Infrastructure

- Minimum Access Package Traffic Operations
- Shunting Personnel Services
- Access to Passenger Stations
- Stabling
Catalogue Network Access 2004

Traffic operation
- Standard package: Train-path construction, utilization of assigned infrastructure
- Additional package: Preparatory works, brake-checks, enhanced opening time

Stops in stations
- Standard package: Utilization of platforms, information of passengers
- Additional package: to be agreed

Shunting
- Standard package: Shunting work by shunting-personnel during regular opening time
- Additional package: to be agreed

Stabling
- Standard package: Parking of vehicles at available spots
- Additional package: Rent of defined track sections

Quelle: ÖBB-Infrastruktur
Charges for Product Package "Train Operations"

- Adjustment for track-friendliness of locomotives
- Market-related adjustments according to train-category
- Mark-up for bottlenecks
- Basic price per Line category

Approximation to marginal costs of maintenance

According to marginal costs study

Train-km

Gross-ton-km
Marginal costs of track maintenance: Results of the Study

Marginal costs all lines: ATS 0,0076
(€ 0,055 )

95%-Konfidenzintervall all lines: ATS 0,0045 - 0,0102 per grosston-km
(€ 0,033 - 0,074 )

Marginal costs core network: ATS 0,0066
(€ 0,048 )

95%-Konfidenzintervall core network: ATS 0,0038 - 0,0090 per grosston-km
(€ 0,028 - 0,065 )

Marginal costs supplementary network: ATS 0,0425
(€ 0,309 )

95%-Konfidenzintervall suppl. network: ATS 0,0251 - 0,0568 per grosston-km
(€ 0,182 - 0,413 )

Alternative method: Engineering approach with experts to define maintenance scenarios for different levels of traffic, thereby developing a cost-function
Line Categories for Charging

- **Red**: Westbahn
- **Blue**: Brenner
- **Green**: Misc. international axis
- **Gray**: Misc. core network
- **Dotted**: Supplementary network
- **Orange**: Narrow gauge lines
### Prices 2004 for Product Package "Train Operations" [€]

<table>
<thead>
<tr>
<th>Train-km</th>
<th>Gross-ton-km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western main line</td>
<td>0,001</td>
</tr>
<tr>
<td>Brenner line</td>
<td></td>
</tr>
<tr>
<td>Misc. intl. corridors</td>
<td>2,02</td>
</tr>
<tr>
<td>Misc. national core network</td>
<td>2,53</td>
</tr>
<tr>
<td>Supplementary network</td>
<td>1,41</td>
</tr>
<tr>
<td>Narrow gauge lines</td>
<td>1,05</td>
</tr>
<tr>
<td>Mark-up for bottlenecks</td>
<td>0,70</td>
</tr>
<tr>
<td>Discount for trains to pick up and deliver single wagons</td>
<td>-0,30</td>
</tr>
</tbody>
</table>
Bottlenecks

Lines with a traffic density far beyond calculated capacity within a 4-hour timeframe.

- Unter Purkersdorf – Rekawinkel: Westward access to Vienna
- Wien Meidling – Mödling: Southward access to Vienna

...each between 5 a.m. and 9 a.m. or 3 p.m. and 7 p.m.

Mark-up per train-km
Product Package "Shunting" (Personnel)

• Incoming trains manipulated
  Trains manipulated by ÖBB-infrastructure personnel:
  Addition of vehicles, decoupling of vehicles, turning of trains in terminus and intermediate stations, division of trains, splitting up arriving trains

• Incoming freight wagons
  Decoupled wagons of through/terminating trains entering a shunting system

• Provided passenger coaches
  Provision of passenger coaches to washing facilities, pre-heating installations, cleaning sidings, stabling sidings, depots or motor vehicle loading installations

• Provided freight wagons
  Provision of wagons at agreed loading siding, leased railway-owned siding, private siding, depot or stabling siding
## Prices 2004 for Product Package "Shunting" [€]

<table>
<thead>
<tr>
<th>Service</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incoming train manipulated</td>
<td>14,85</td>
</tr>
<tr>
<td>Incoming freight wagon</td>
<td>2,60</td>
</tr>
<tr>
<td>Provided passenger coach</td>
<td>1,50</td>
</tr>
<tr>
<td>Provided freight wagon</td>
<td>4,00</td>
</tr>
</tbody>
</table>
Product Package "Access to Passenger Stations"

- Access to platforms in stations according to their availability and according to the agreed timetable

- Traffic-related information of passengers e.g. about connections, delays etc. by the available means (loudspeakers, electronic displays)
## Prices 2004 for Product Package "Access to Pass. Stations" [€]

<table>
<thead>
<tr>
<th>Station-fee per scheduled stop</th>
<th>Local train</th>
<th>Semi-fast train</th>
<th>Express train</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category 1</td>
<td>2,80</td>
<td>5,50</td>
<td>18,00</td>
</tr>
<tr>
<td>Category 2</td>
<td>1,40</td>
<td>2,90</td>
<td>8,00</td>
</tr>
<tr>
<td>Category 3</td>
<td>1,10</td>
<td>2,20</td>
<td>6,00</td>
</tr>
<tr>
<td>Category 4</td>
<td>0,60</td>
<td>1,30</td>
<td>3,50</td>
</tr>
<tr>
<td>Category 5</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
</tr>
</tbody>
</table>
Prices 2004 for Product Package "Stabling" [€]

- Fee per vehicle and day stabled

- Price: 2,00 €

- Day stabled:
  Idle vehicles which are not integrated in an actual transport cycle and are stabled on infrastructure track for more than 24 hours before further destination
## Further Product-Development: Differentiation

<table>
<thead>
<tr>
<th>Market segments</th>
<th>Products</th>
<th>Levels of Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block train freight</td>
<td>Traffic mgmt.</td>
<td>Quality</td>
</tr>
<tr>
<td>Combined traffic</td>
<td>Facilities</td>
<td>Quality</td>
</tr>
<tr>
<td>Carload freight</td>
<td>Services</td>
<td>Quality</td>
</tr>
<tr>
<td></td>
<td>Traffic mgmt.</td>
<td>Quality</td>
</tr>
<tr>
<td>Service runs</td>
<td>Direct traffic</td>
<td>Quality</td>
</tr>
<tr>
<td></td>
<td>Facilities</td>
<td>Quality</td>
</tr>
<tr>
<td></td>
<td>Services</td>
<td>Quality</td>
</tr>
</tbody>
</table>

Traffic via nodes:
- Traffic mgmt.: Quality
- Facilities: Quality
- Services: Quality

Direct traffic:
- Traffic mgmt.: Quality
- Facilities: Quality
- Services: Quality

Service runs:
- Traffic mgmt.: Quality
- Facilities: Quality
- Services: Quality
Generation of the Invoice

LDZ records and calculates the relevant data

Data-transfer to server

Data-input to SAP R/3

Finalizing the invoice for the customer

export of data

monthly import of data for the invoices
LDZ - Big Picture

Creation of daily timetable for operative systems

Automatic check

Import of real-time data from operative systems

Data-export to SAP

Manual completion of missing data

Timetable data: annual, daily, ad-hoc

Real-Time Data
Plandata
Daily program

ARTIS

LEIDIS-N
ÖBB-Infrastructure is Open for Access

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