

Analyzing the Perspectives for Intramodal Competition in the Railroad Industry – the Case of Long-Distance Passenger Transport

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1 April 2009, Brussels

Background and objectives

- Directive 2007/58/EG of the European Parliament and the Council (October 2007) foresees market opening of the European long-distance passenger rail sector after 2010
- European rail operators initiated or plan co-operations on long distance passenger transport (e.g. „Railteam“)

➔ Assessment of these co-operations from a competition policy perspective

Overview

- Empirical assessment of competition in long-distance rail passenger transport
 - Panel data analysis: impact of LCA entry on passenger rail transport
 - Scenario analysis: intramodal entry scenarios based on revenues & costs (R&C) model
- Assessment of potential anti-competitive effects of alliances

Article 81 - assessment of the Railteam alliance

- Before 2010: no competition that could be harmed
 - Railteam enhances passenger comfort and service quality without interference in the process of operators independently determining the existence, the extent, and the frequency of individual train services
 - Given its scope and existing levels of competition in the long-distance passenger transport segment, Railteam is currently pro-competitive
- ➔ Question: Will the assessment change when market entry will *de jure* be possible and when deeper alliances emerge?
- ➔ ESMT study:
- Assess the extent and magnitude of *intermodal* competition from aviation
 - Assess the intensity of *intramodal* competition post-liberalization absent any co-operation (i.e. the intramodal counterfactual)

Main findings

- We find evidence of significant intermodal competition between low cost airlines (LCAs) and rail operators
 - A rail operator loses at least 7% of its passengers and 8% of its passenger km due to entry by LCAs. We also find significant price effects of LCA entry in both first and second class

- Our scenario analysis suggests that entry is unlikely to be profitable in most long distance O&Ds
 - The most profitable entry strategy is related to an independent entrant in the Intercity segment, which is likely only under rather optimistic assumptions with respect to network effects and capacity utilization

- Overall, we find limited evidence for intramodal competition to emerge post 2010, while past experience from the airline alliances – albeit in a different setting – suggests that international alliances result in considerable efficiency gains

Empirical assessment of competition in long-distance rail passenger transport

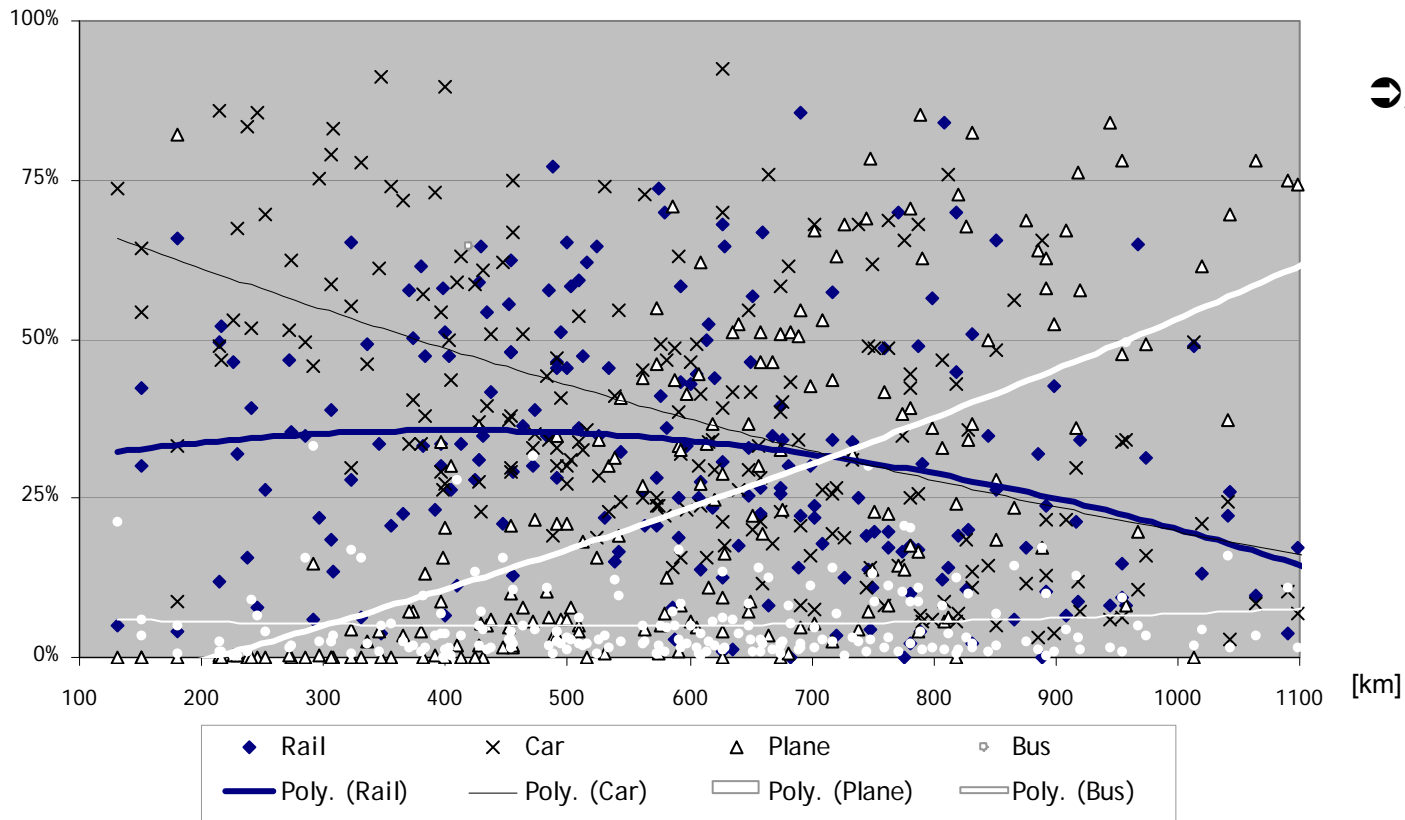
- Impact of LCA entry on passenger rail transport: Panel data analysis
- Intramodal entry scenarios based on revenues & costs (R&C): Scenario analysis

Data set

- 207 O&Ds observed over a period of 22 months from January 2006 to October 2007: 4554 O&D-month observations
- 130 international routes (63%)
- 33 LCA entries (16%) between January 2006 and October 2007
- Control variables
 - Population & fuel cost data: Eurostat, Statistisches Bundesamt
 - Train type, railroad costs and track data: DB Trassenpreise; EICIS
 - Driving duration (individual car traffic): Marco Polo Route planner 2006/07
 - Number of airline seats and flights: Arbeitsgemeinschaft deutscher Verkehrsflughäfen (ADV)
 - Flight duration and delay: Association of European Airlines (AEA); ADV; Lufthansa

Intermodal split

Intermodal split vs. distance

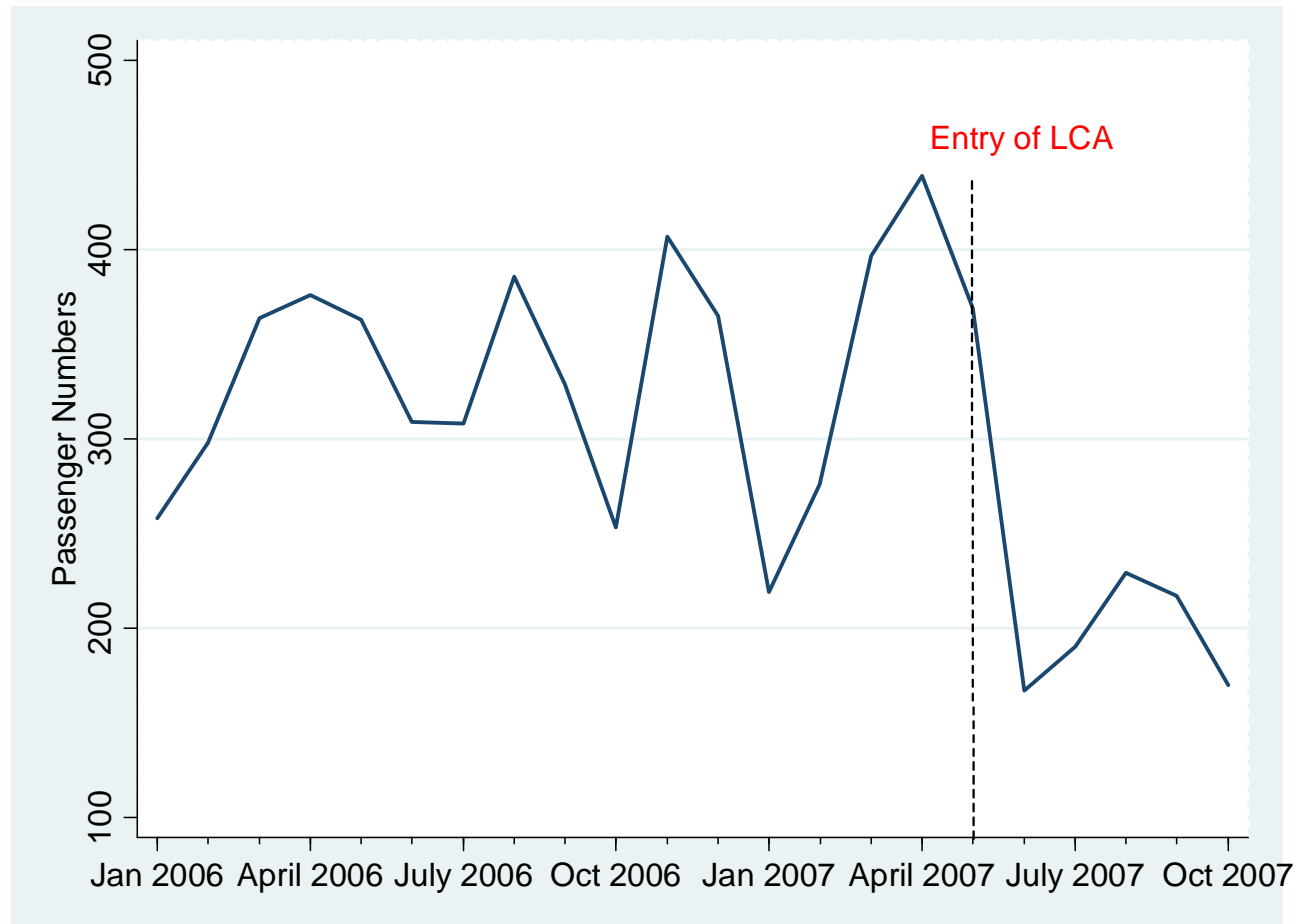


➡ Airlines appear to be effective for distances above 300-400 km

Source: Intraplan data; trend line ESMT CA; based on passenger figures; 2005 data

Intermodal competition: Example of LCA entry

- Effect on passenger numbers (second class) due to LCA entry in May 2007



2. Panel data analysis: Model

- Econometric model:

$$y_{it} = \delta LCA_{it} + \gamma \mathbf{z}_{it} + \lambda_t + \varepsilon_{it}$$

- Where:

- i : a given O&D pair
- t : time
- y_{it} dependent variable, natural logarithm of
 - (i) passenger numbers (lpax), (ii) average ticket price (lavprice), (iii) revenue (lrev), (iv) passenger-kilometres (lpkm)
 - first class and second class
- LCA_{it} : dummy variable equal to 1 in the period of entry and subsequent operation for those routes which experienced LCA entry over our observation period
- δ : key indicator of the analysis: long-term percentage change of y because of LCA entry
- \mathbf{z} : vector of control variables
- λ_t : control variable for seasonal effects
- ε_{it} : the error term

Panel data analysis: Endogeneity of Entry

- LCA entry is a strategic decision
 1. Entry → lower price (negative relation/correlation between entry and prices)
 2. High price → entry of LCA (positive relation/correlation between entry and prices)
- We are interested to identify effect 1 (Note: simple OLS estimates yield the wrong answer)
- In order to correctly support an antitrust analysis, the empirical methodology must account for this endogeneity and separate the effects!
 - ➡ We use instrumental variables (instruments are LCAs operating to another destination)

Panel data analysis: results

	Complete sample					Additional controls				
	Random effects				IV (ML)	Random effects				IV (ML)
Column number	1	2	3	4	5	6	7	8	9	10
Depend. variable	Passengers	Avg. Price	Revenues	Pkm	Avg. Price	Passengers	Avg. Price	Revenues	Pkm	Avg. Price
Second class										
Effect of LCC entry (□)	- 6.8%**	2.40%	-4.50%	- 8.9%**	-27.0%***	-17.0%***	0.00%	-16.7%***	-16.4%***	-17.6%***
No. obs	4421	4415	4415	3527	4415	1652	1652	1652	1652	1652
No. O&Ds	207	207	207	168	207	84	84	84	84	84
R-squared	0.394	0.45	0.43	0.279		0.684	0.767	0.641	0.578	
First class										
Effect of LCC entry (□)	0.003%	2.50%	3.80%	1.00%	-15.6%***	-18%***	3.6%**	-15.7%***	-23.1%***	-19.7%***
No. obs	3916	3886	3886	3325	3886	1634	1631	1631	1634	1631
No. O&Ds	201	201	201	168	201	84	84	84	84	84
R-squared	0.498	0.588	0.439	0.238		0.758	0.757	0.744	0.715	

*p<.10, **p<.05, ***p<.01; "Complete sample" controls for LCA presence, domestic route, prices of coal, kerosene & oil, distance, orig & dest popn., and ICE ; "Additional controls" also controls for number of seats, flights, flight delay, driving duration, train duration, air duration, railpath prices.

Effect of LCA entry: Passengers and prices

- Passengers - second class
 - Statistically and economically significant negative effect on passenger numbers
 - 7%-17% decrease of passenger numbers, depending on dataset
- Passengers - first class
 - Negative effect on passenger numbers less pronounced
 - Up to 18%, depending on dataset
- Prices
 - Strategic entry is important
 - After accounting for strategic entry (endogeneity), LCA entry results in significantly lower prices in both the first and second class. Price effects vary between 16% and 27%

Results of analysis of intermodal competition

- LCAs induce substantial competitive pressure
- Competitive pressure can be observed in first and second class and has an effect on both passenger numbers and prices
- Intermodal competition has to be part of a competitive assessment of future rail alliances

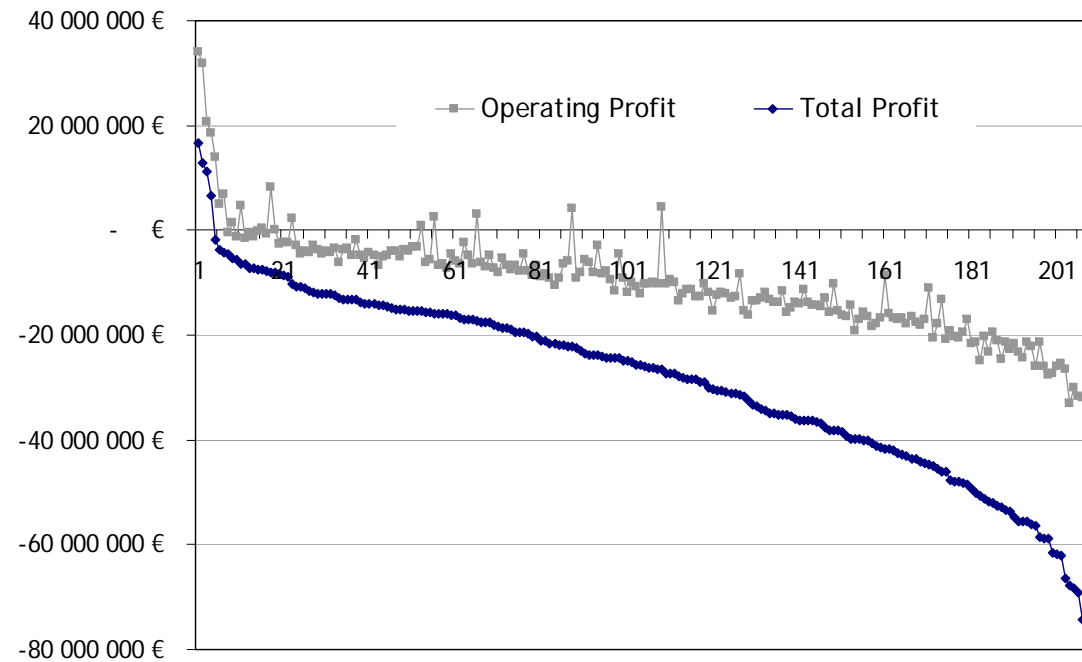
Scenario analysis: profitability of individual O&Ds in long-distance rail passenger transport

- Objective
 - Assessing the post-2010 counterfactual, i.e. the competitive situation that would prevail absent any co-operation
- Methodology
 - Base pre-entry profitability on costs (with and without capital costs) and revenues for *each* O&D
 - Pre-entry profitability provides upper bound of post-entry profitability for entrants
 - Various entry scenarios for entrants
 - top-down (ICE technology) vs. bottom-up (Intercity technology)
- Three additional effects are part of the analysis
 - Impact of intermodal competition
 - Network effects
 - Public service operator levy

► Status quo Scenario: independent entrant (ICE technology)

- **Result**

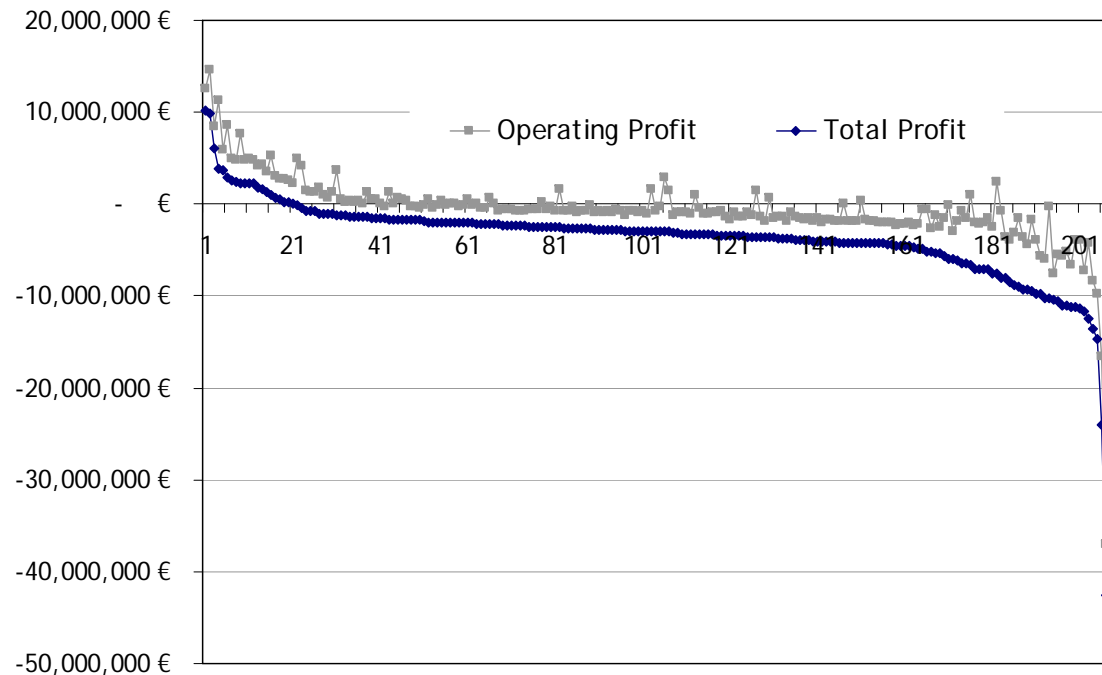
- Only 4 out of 207 O&Ds break even (including capital costs)



Scenario 2010: independent entrant (intercity technology)

Result

- 16 out of 207 O&Ds break even
- 59 O&Ds show positive operating profit



Assumptions

- Entrant takes over only the slower intercity connections
- Frequency of intercity trains is reduced to correspond to the actual load factor, i.e. load factor = 100%, no demand effect
- Reduction of operating costs by 10-20% (but higher energy costs)
- Possibility of cabotage, no transfer passengers, public service levy imposed over total distance
- Reduced capital costs (approx. 50% of costs of ICE)

Results of analysis of intramodal competition

- Expansion in the high-speed rail passenger transport segment does not appear profitable on most O&Ds
 - the very few profitable routes are domestic and high frequency services

- Highest likelihood of entry in the intercity segment on longer O&Ds with slower, but cheaper services over longer distances
 - only under rather optimistic assumptions

Antitrust assessment of alliances post-2010

- O&Ds with low likelihood of intramodal entry
 - Relevant for most of the international O&Ds in the sample
 - ➔ Alliances unlikely to have anti-competitive effects

- O&Ds with limited likelihood of intramodal entry
 - Intercity segment with independent entrants
 - ➔ Alliances may have anticompetitive effects in these segments
 - ➔ In order to counterbalance potential anticompetitive effects, alliances would have to
 - ✓ prove the existence of significant intermodal competitive pressures
 - ✓ induce and show significant efficiency gains

Antitrust assessment of alliances post-2010: two building blocks

- **Intermodal competition**
 - Intermodal competition is a significant competitive restraint on long distance passenger rail services
 - ➔ Antitrust assessment needs to take this into account
- **Efficiencies of rail alliances**
 - Joint ticketing and “hop on the next train” are in line with the European Commission’s policy to create a integrated and efficient rail market for passengers
 - More efficiencies may be reaped by future alliances, such as through flexible pricing schemes, eliminating double-marginalization and coordination of services
 - ➔ Experience with alliances in other industries (airlines) suggests that alliances in transport industries may lead to lower prices and better customer service

Railway Alliances in EC Long-Distance Passenger Transport: A Competitive Assessment Post-Liberalization 2010

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