

# Workshop on Financing, Regulation and Performance of the European Rail Sector

Justus-Liebig-University  
Giessen - May 11-12, 2017

## Competition For *versus* On the Rail in the Long Distance Passenger Market

Marc IVALDI

---

## Joint with

Frédéric Cherbonnier, *Toulouse School of Economics*

Catherine Muller-Vibes, *Toulouse Business School*

Karine Van Der Straeten, *Toulouse School of Economics*

# Implementing the competition of the rail mode

- Two schemes
  - **For** the market = Franchise
  - **On** the market = Open access
- Evaluation
  - Net gains
  - Trade-offs
- The long distance passenger market

# Limited success and effects of open access

- Germany
  - Opening up to competition in 1994
  - Market share of competitors = 1% !!!
- UK
  - Franchise + Open access
  - Traffic in open access = 1% (passenger-km) !!!
- Sweden
  - 2% of the traffic !!!
- Czech republic
  - 40% on one line: Prague-Ostrava
- Austria
  - 25% on one line: Vienna-Salzburg
- Italy
  - 25% overall (Turin-Milan-Venise / Milan-Rome-Naples)
  - Profitability in question

# Causes

- Cost structure
  - Returns to scale
  - Economies of scope and density
  - Cost complementarities between infrastructure and operation
- Demand structure
  - Product complementarity / network effect
  - Mohring effect

# The academic literature

- Spain
  - Álvarez-SanJaime *et al* ; De Rus *et al*; Cantos *et al*
- Uk and Sweden
  - PRAISE model (Britain & Sweden):
  - Preston Wardman Whelan ; Preston, Holvad et Raje ; Johnson and Nash
- Germany
  - Ivaldi and Vibes (2008)
    - Inter- and intra- modal competition
    - Strategic interaction between transport operators

# Methodology

- Specification of the long distance passenger market
  - An oligopoly with differentiated products
- Derivation of the equilibrium conditions
  - Determination of prices
- Calibration of the model
  - Recovering the parameters of interest from available data
    - Available data: market shares, prices, marginal costs
    - Parameters of interest: Price elasticities, conduct parameters, etc
- Simulation: Scenarios of entry
  - For the market
    - The entrant can replace the incumbent
  - On the market
    - The entrant competes with the incumbent

# Ingredients

- Oligopoly: Intramodal competition
  - Transport mode: Air / Rail / Others
  - One operator per mode
- Differentiated products
  - Different levels of quality (speed, frequency, reliability, confort, ....)
- Demand
  - Two types of passenger: leisure or business
  - Consumers choose one transport mode
- Supply
  - Others: no strategic behavior
  - Air: profit maximization
  - Rail: Maximization of profits + a share of consumer surplus



# The rail operator's behavior

- Price regulation from the State
  - A second class ticket cannot be priced more than 50% of a reference price ticket
- Pressure from stakeholders
  - Unions, regional authorities
- Predatory strategies
  - Limiting the risk for entry

$$\frac{p_j - c_j}{p_j} = \frac{1 - \mu}{\varepsilon_j}$$

# Drivers of entry

- Marginal cost (MC)
  - Operation cost
  - Access charges
- Shadow cost of governance constraints (SC)
  - Explicit or implicit price regulation
  - Pressure of interest groups
    - passengers, unions, corporate strategy
- Quality index (QI)
  - speed, frequency, reliability, confort
- Access pricing
  - Subsidies
  - Two-part tariff
    - Access charge to cover fixed cost
    - Reservation fee to cover marginal cost and cost of congestion.



**PARIS - BORDEAUX**

**PARIS - MARSEILLE**

# Data for Paris-Marseille - Leisure segment (2016)

	Market Share	Price	MC
SNCF	0.548	64.9	49.1
Air	0.084	86.3	53.9
Car	0.346	59.1	
Blablacar	0.022	44.3	

# Calibration

	<b>Market share</b>	<b>Price elasticity</b>	<b>Quality</b>
<b>SNCF</b>	<b>28.0</b>	<b>-1.6</b>	<b>1.7</b>
<b>Air</b>	<b>4.7</b>	<b>-2.7</b>	<b>0.5</b>
<b>Car</b>	<b>19.4</b>	<b>-1.5</b>	<b>1.0</b>
<b>Blablacar</b>	<b>1.2</b>	<b>-1.4</b>	<b>-2.2</b>
<b>Others</b>	<b>46.7</b>		

<b>Shadow cost</b>		<b>0.55</b>
<b>Consumer surplus</b>		<b>64</b>
<b>Welfare</b>		<b>102</b>
<b>Profit</b>	<b>SNCF</b>	<b>15</b>
	<b>Air</b>	<b>4</b>
	<b>Infra</b>	<b>16</b>

		Status Quo		Opex x 0,70 and Tolls = SQ	
SC		0,55	0,00	0,55	0,00
Marginal Costs	Opex	23,8	23,8	16,7	16,7
	Tolls	25,3	25,3	25,3	25,3
Change in Price	Rail	0	26,6	-8,7	18,2
	Air	0	0,3	-0,1	0,2
Change in MS	Rail	0	-36,7	14,5	-26,3
	Air	0	13,5	-5,4	9,7
	Car	0	14,3	-5,7	10,3
	Blablacar	0	14,3	-5,7	10,3
	OG	0	14,3	-5,7	10,3
Change in Profit	Rail	0	23,2	21,4	48,5
	Air	0	14,3	-5,7	10,3
	INFRA	0	-36,7	14,5	-26,3
Change in Consumer Surplus		0	-17,6	7,7	-12,9
Change in Welfare		0	-13,9	10,4	-5,5

# Two part tariff

---

		NEW: Opex x 0,7 SNCF: Opex = SQ Tolls = SQ	NEW: Opex x 0,7 SNCF: Opex = SQ Tolls = SQ
Quality New		100%	<b>10%</b>
Quality SNCF		100%	100%
Change in Price	SNCF	-6,8	-0,5
	Air	-0,3	0,0
Market Share	NEW	16,8	<b>0,8</b>
	SNCF	23,1	27,9
	Air	4,0	4,7
	Car	16,2	19,2
	Blablacar	1,0	1,2
	OG	38,9	46,2
Change in Profit	SNCF	-37,6	-2,5
	RAIL	51,4	0,8
	Air	-16,6	-0,9
	INFRA	42,4	2,3
Change in Consumer Surplus		23,8	1,2



OPEX*0.7 – Tolls =SQ		ON THE MARKET	FOR THE MARKET
Marginal Costs	New Opex	16,7	16,7
	New Tolls	25,3	25,3
	SNCF Opex	23,8	
	SNCF Tolls	25,3	
Price	NEW	70,5	62,4
	SNCF	63,7	
	Air	86,0	86,2
Change in Price	Rail	-6,8	-8,7
	Air	-0,3	-0,1
Change in MS	Rail	-17,6	14,5
	Air	-15,9	-5,4
	Car	-16,6	-5,7
	Blablacar	-16,6	-5,7
	OG	-16,6	-5,7
Change in Profit	SNCF	-37,6	
	RAIL	51,4	21,4
	Air	-16,6	-5,7
	INFRA	42,4	14,5
Change in Consumer Surplus		23,8	7,7

50 - 80

---

# Lessons from the simulations

- Competition for the market
  - Lower costs, same quality
    - Large gains for the consumer/passenger
  - Lower shadow cost of governance constraints
    - Large losses for the consumer/passenger
- Competition on the market
  - Lower quality, same shadow cost
    - Drastic impact on prices and market shares
  - Lower shadow cost of governance constraints
    - Higher impact on prices than the effect of entry
- Two-part tariffs
  - Good for the consumer
  - Bad for SNCF

# General conclusion

- Competition on the market is risky
  - Role of quality and shadow cost of governance constraints
- In favor of competition for the market
  - Regulation cannot be avoided
  - Two-part tariff
  - Better sharing of social gains

**Thank you!**