

Air Navigation Service Charges in Europe

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7th USA/EUROPE ATM R&D SEMINAR

Barcelona, Spain

July 2 – 5, 2007

Some geography



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ATM 2007
Barcelona, 4 July 2007

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Outline

- ◆ Overview of Air Navigation Service (ANS) charges in Europe
- ◆ Impact on stakeholders:
 - ANSPs, Airspace Users, Passengers
- ◆ Role in the Single European Sky initiative

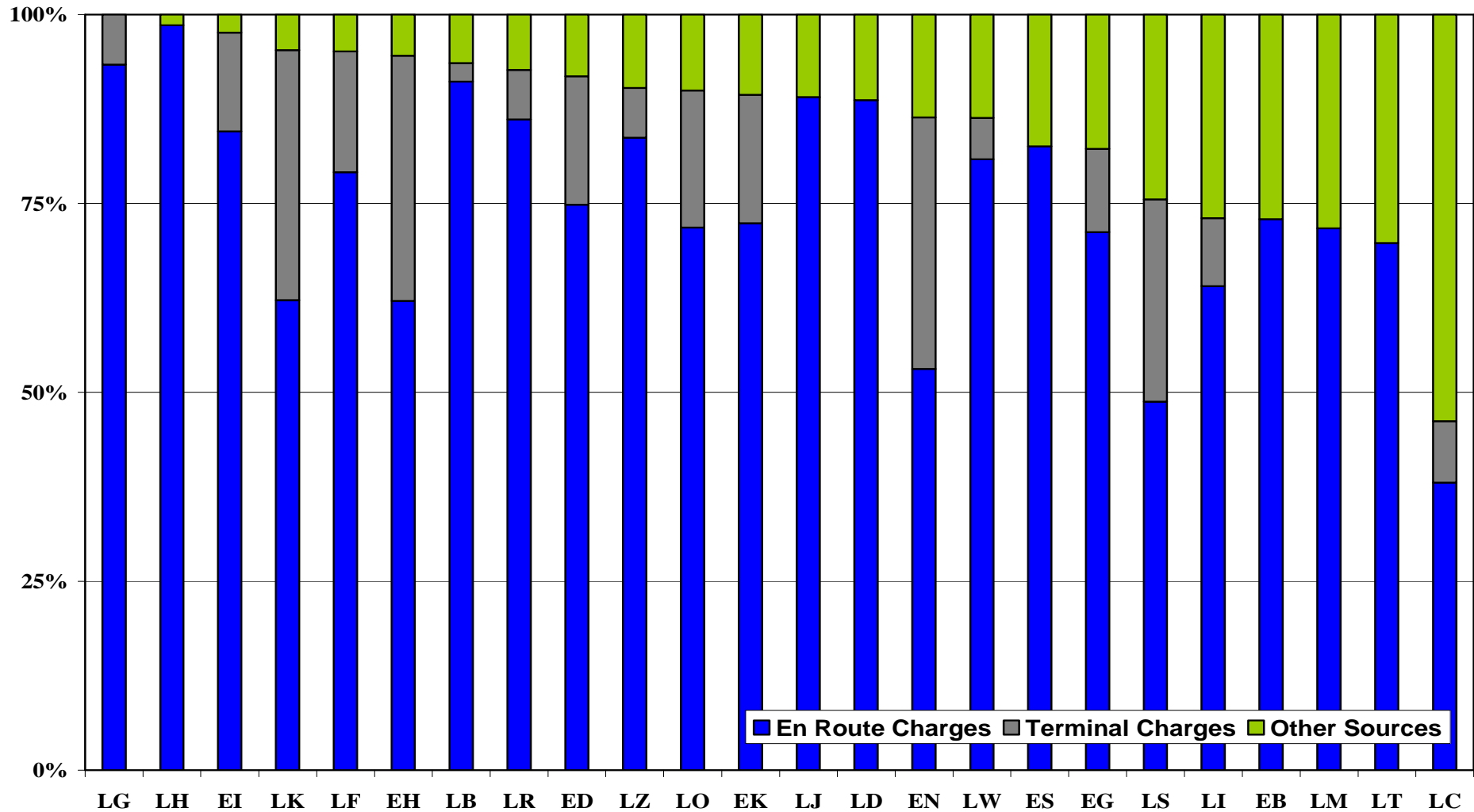
Air Navigation Service Charges

- ◆ EC Regulation 1794/2006 laying down a common charging scheme for air navigation services
- ◆ Distinction between **En route** and **Terminal** charges
- ◆ They are imposed on the users of ANS. Exemptions apply

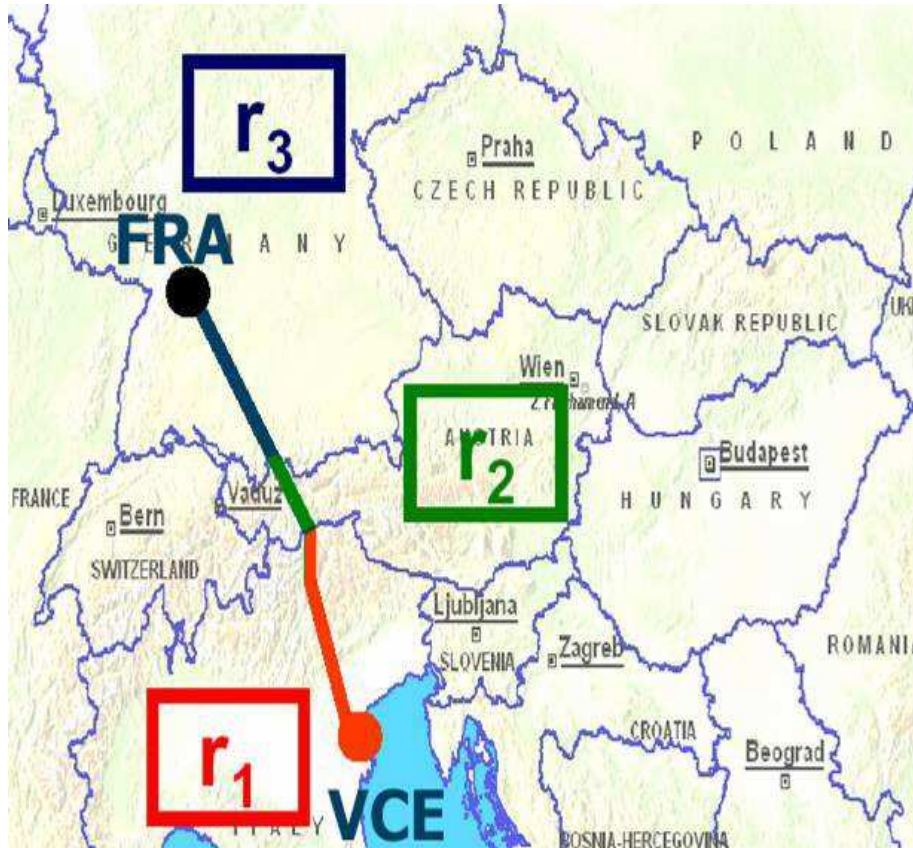
Key economic figures

- ◆ Major source of revenue of any European ANSP
- ◆ Amounts for 9% of direct operating costs of Association of European Airlines (AEA) members in 2005
- ◆ EC estimates that for *'every euro spent on airline ticket today, some 6% is devoted to ANS charges'*

ANSP Revenue breakdown - Year 2004



En Route charges



Total charge per flight	$R = \sum_{i=1}^n r_i$
National charge	$r_i = d_i * p * t_i$ Service Units
Distance factor	d_i
Weight factor	$p = \sqrt{\frac{MTOW}{50}}$
National Unit Rate	t_i

National En Route Unit Rate

- ◆ For State i , the unit rate of year y is decided in year $y-1$:

$$t_i(y) = \frac{c_i^F(y)}{su_i^F(y)}$$

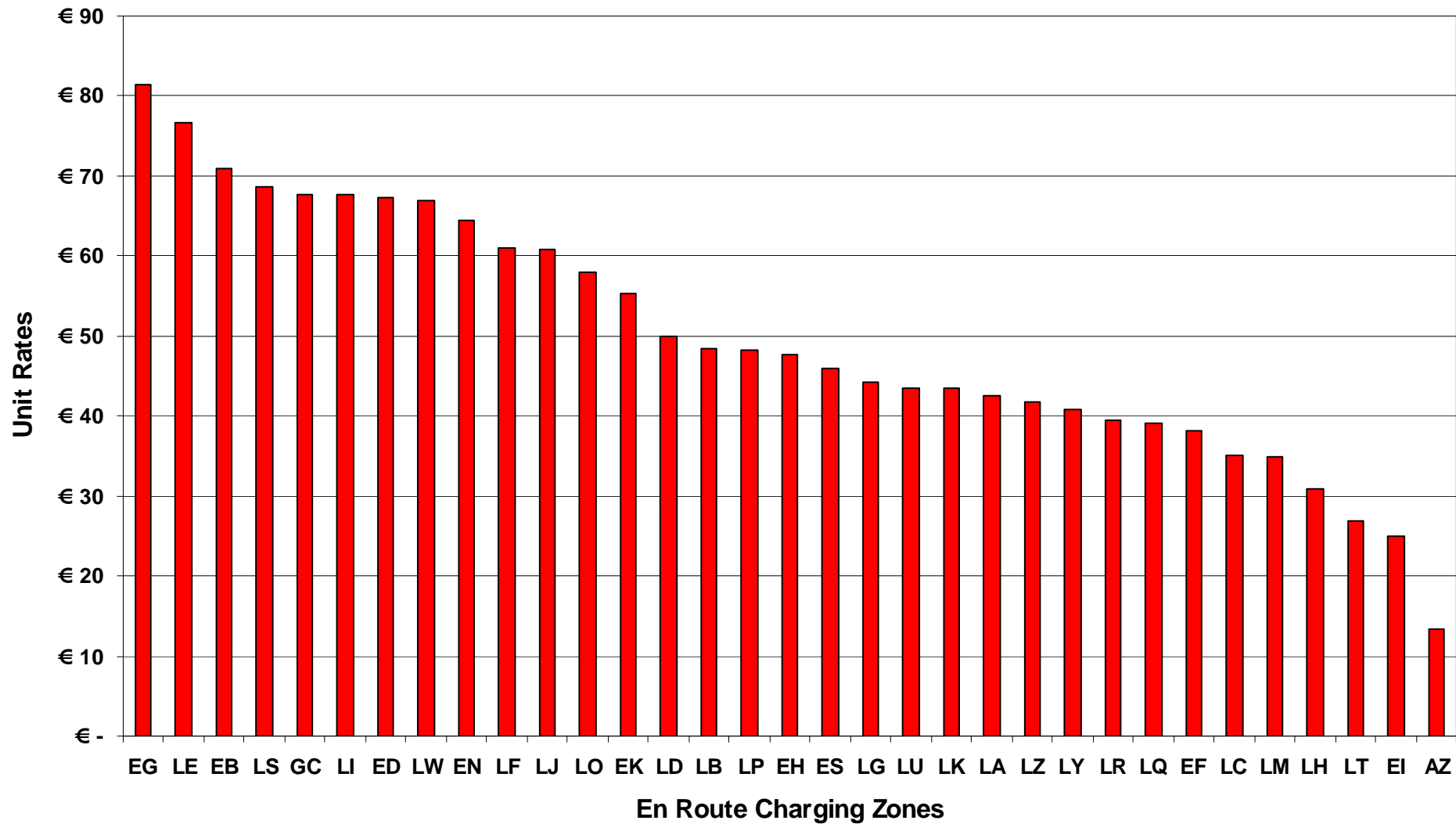
Where for state i

- $c_i^F(y)$ are the forecasted costs for providing en route services in year y
- $su_i^F(y)$ are the forecasted en route service units in year y

The Full Cost Recovery Principle applies:

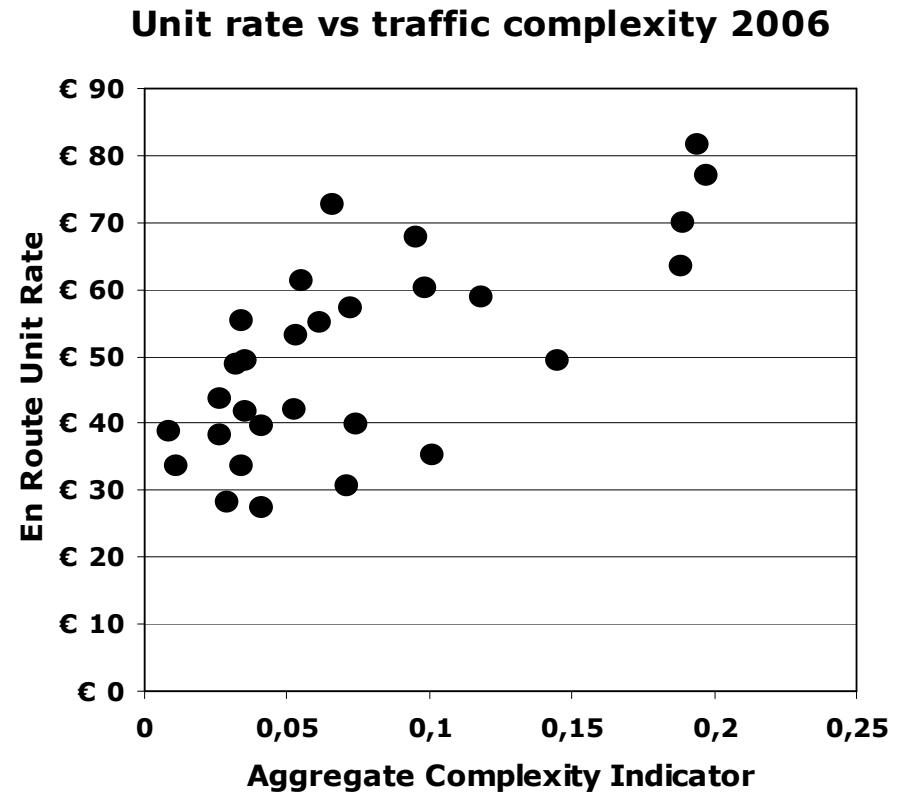
- ◆ The unit rate of all states (except UK) is such that the **total expected revenues cover the total expected costs** for providing ANSs
- ◆ Compensation if differences between actual and expected revenues

En Route Unit Rates – July 2007

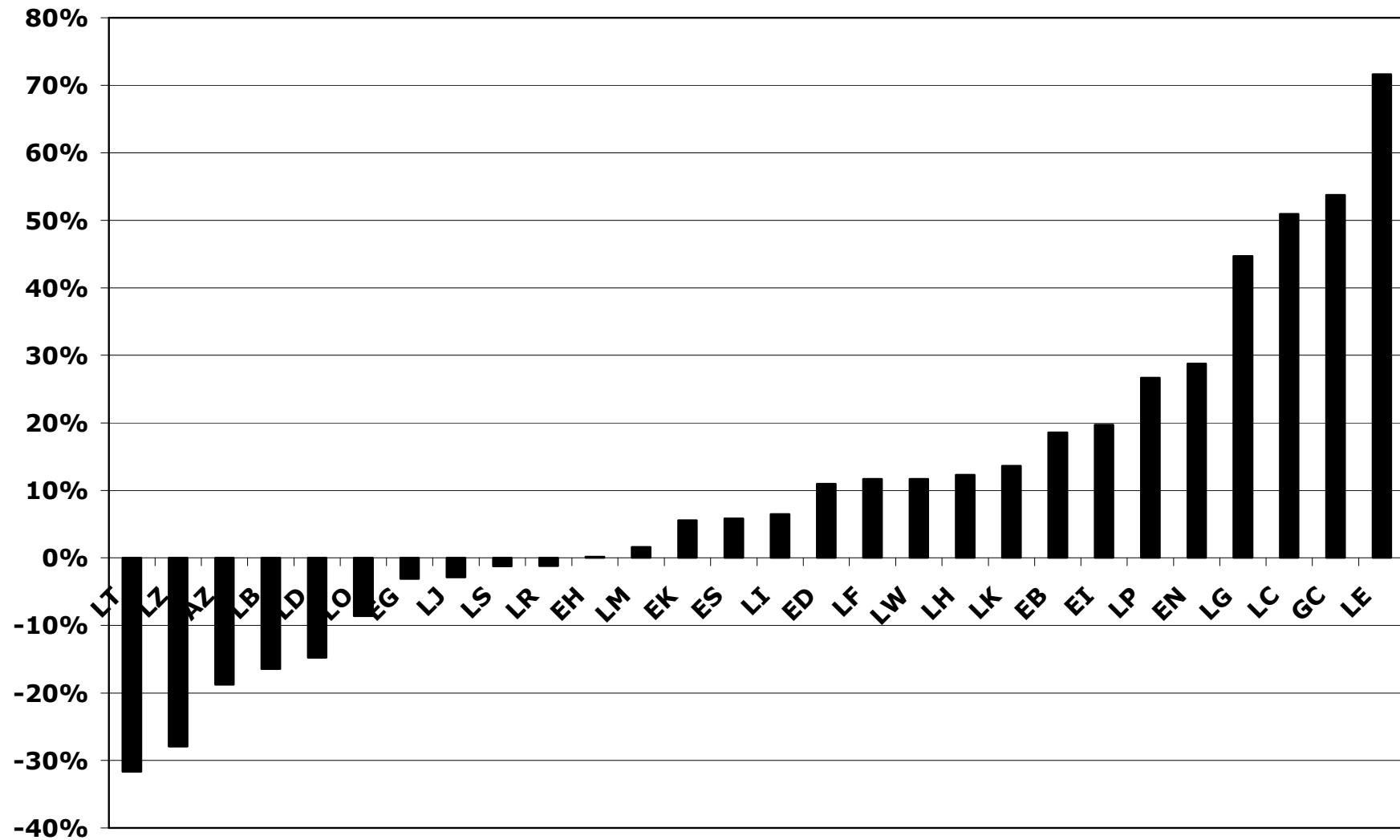


Drivers for unit rate differences

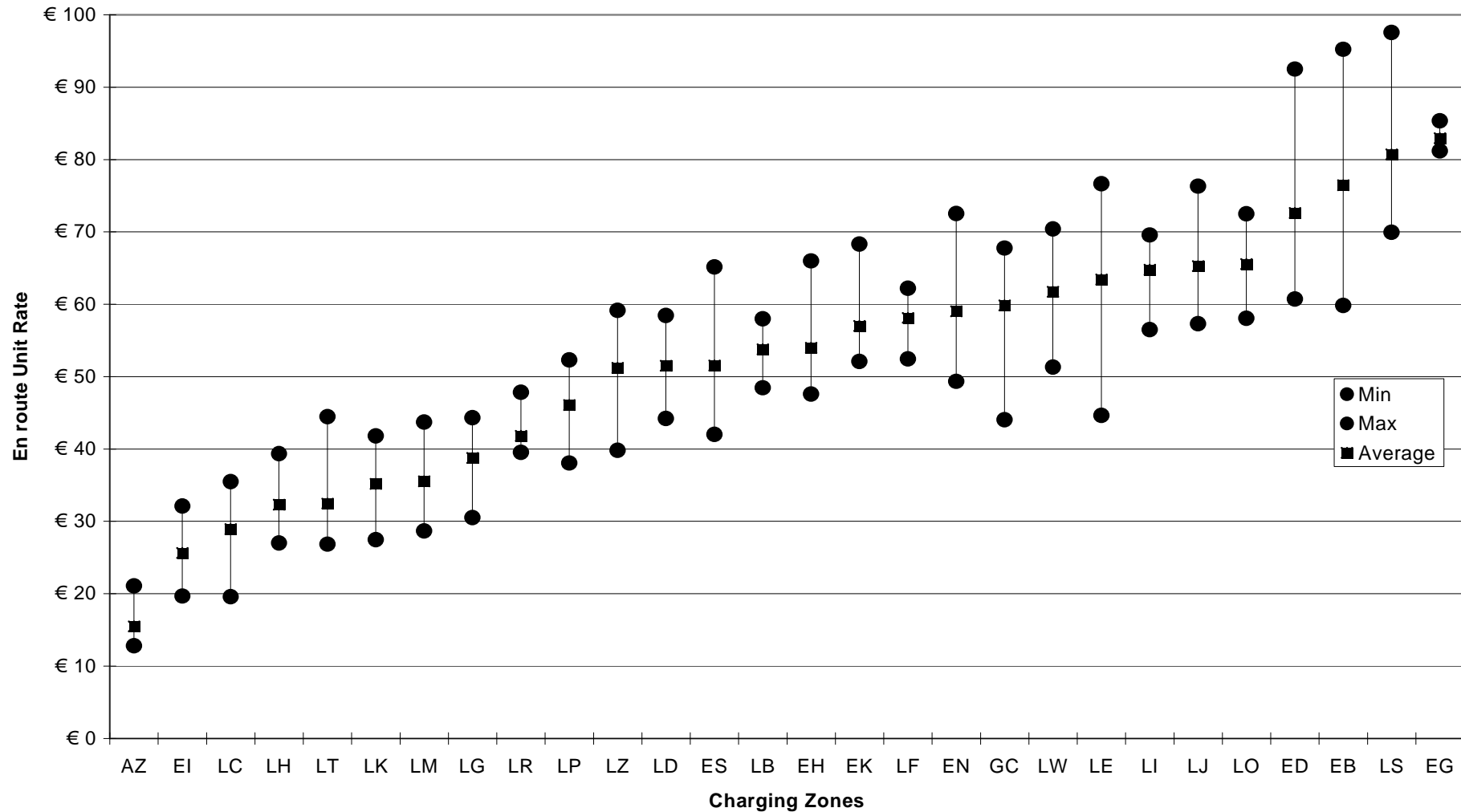
- ◆ Staff costs per service unit for providing en route services
- ◆ Airspace traffic complexity
- ◆ $R^2 = 0.84$
- ◆ Cross-subsidizations (no terminal charges in some countries)



Unit Rate variation (%): 2000 - 2007



Min, Max & Average En Route Unit Rate from 2000 to 2007

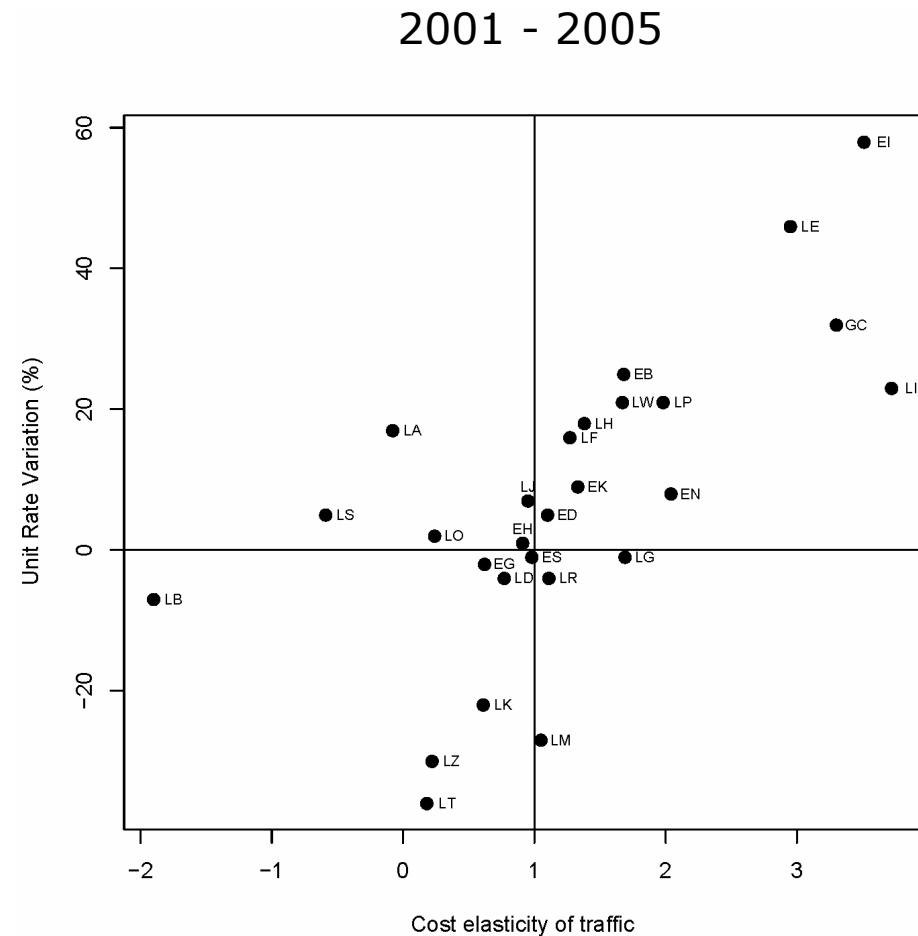


Cost elasticity of traffic

$$\eta_i = \frac{\frac{C_{i,2005} - C_{i,2001}}{C_{i,2001}}}{\frac{S_{i,2005} - S_{i,2001}}{S_{i,2001}}}$$

◆ $\eta_i > 1$ (cost rate higher than traffic rate): Unit Rate UP

◆ $\eta_i < 1$: Unit Rate DOWN



Heterogeneity in space and time

- ◆ Labour costs
- ◆ Airspace complexity
- ◆ Different insitutional models
- ◆ Cost allocation
- ◆ Each ANSP plans on its own
 - Development of ATM systems
 - New infrastcture
 - Training

Terminal Charges

TC = Terminal Unit Rate
* Weight Factor

- ◆ So far, high variability
- ◆ But, EC 1794/2006 enforces consistency
 - Unit Rate > € 0
 - Weight Factor:
 $(\text{MTOW}/50)^{0.70}$

Terminal Unit Rate	
EB, ES, LM	€ 0.00
LI	€ 2.01
EI	€ 2.12
LH	€ 123.34
LJ	€ 217.87

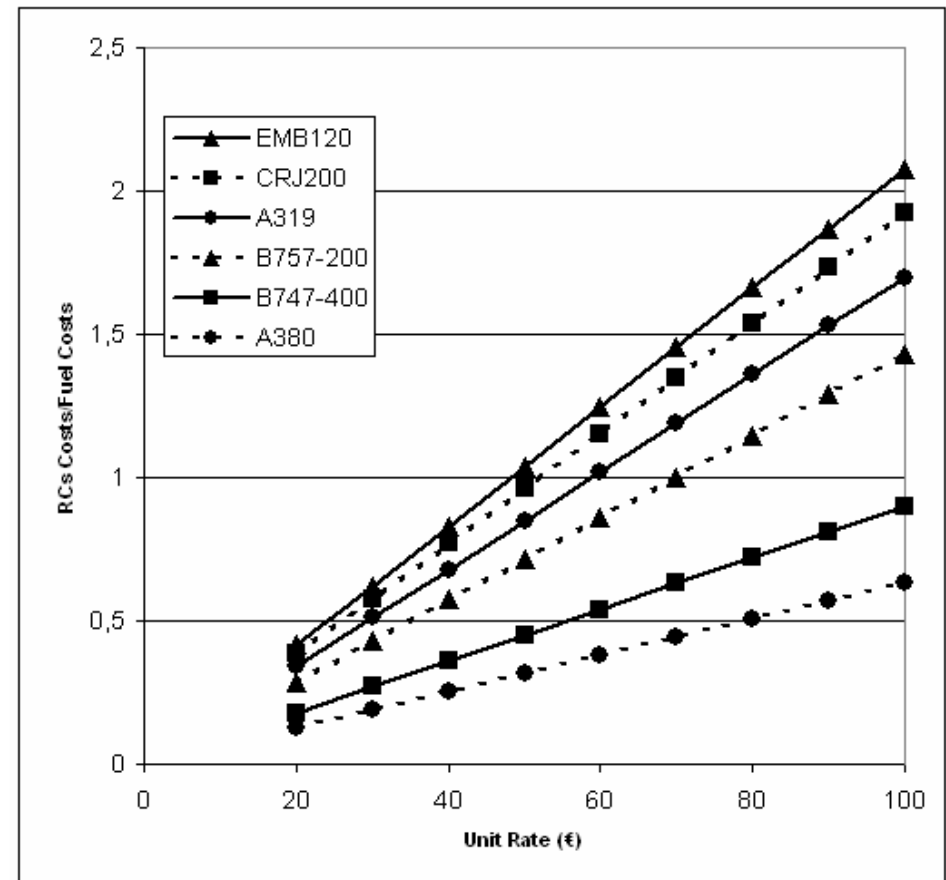
Weight Factor	
EK	MTOW
LI	$(\text{MTOW})^{0.95}$
LJ	$(\text{MTOW}/50)^{0.70}$
LH	$(\text{MTOW}/50)^{0.50}$

ANS Charges on user costs

Airline	Total operating costs FY 2005	En route charges FY 2005	Share
Austrian Airlines	2585.8 €m	126.6 €m	4.9%
Iberia	4823.2 €m	276.4 €m	5.7%
EasyJet	1132.5 £m	108.6 £m	9.6%
Ryanair	1007.1 €m	135.7 €m	13.5%

Economic impact on airspace users

- ◆ Non negligible share of operating costs
- ◆ Comparable cost per km as fuel cost per km, especially for small aircraft (Jan 2007 data)



ANS Charges on Route Selection

- ◆ Airspace Users may select longer routes because of differences in route charges (PRR 2006, 6.2.13; Trieste Univ., 2004; Belgrade Univ., 2005).
- ◆ The present charging scheme does not promote the best use of available airspace: it may be a driver for flight inefficiency

ANS charges on passengers

- ◆ US: FAA's ATC operations are in part funded by
 - Federal ticket (7.5% of base fare ticket price)
 - Segment taxes
- ◆ EU: ANS charges are paid by airspace users and not directly by passengers.
 - Preliminary studies suggest they account for 6 – 7% of base fare ticket (Yamanaka et al., 2005; EC, 2006)

The way forward

- ◆ To reduce fragmentation: the ongoing Single European Sky framework
- ◆ European Airspace is reconfigured in Functional Block of Airspaces (FABs):
 - Cross-borders airspaces optimised on the base of operational requirements
- ◆ **Charging zones** defined in manner consistent with ATC operations and services
 - One unit rate per charging zone

Some FAB initiatives



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Charging policies for FABs

- ◆ FABs should reduce unit costs for providing ANSs
- ◆ Which charging policy to adopt?
 - One unit rate per FAB (thus improved flight efficiency)
 - The setting of 5 years unit rates (PRR 2006)
 - Incentive mechanisms to ANSPs and/or airspace users: spatial and peak differentiation, airborne equipment (EC 1794/2006)

Challenges

- ◆ Is it feasible to provide a cross-border charging scheme when ANSP en route unit rates are very different? (Collection vs Redistribution)
- ◆ From 37 unit rates varying every month to 6-7 unit rates held constant for five years?
- ◆ Regulation EC 1794/2006 provides consistency and opens new directions

Conclusions

- ◆ ANS charges play a major role in shaping Air Transportation in Europe from an economic perspective
- ◆ FAB reconfiguration & EC 1794/2006 may lead to new ANS charging patterns
- ◆ Plenty of room for study and research