Ramsey Pricing

-

An application to German Airports

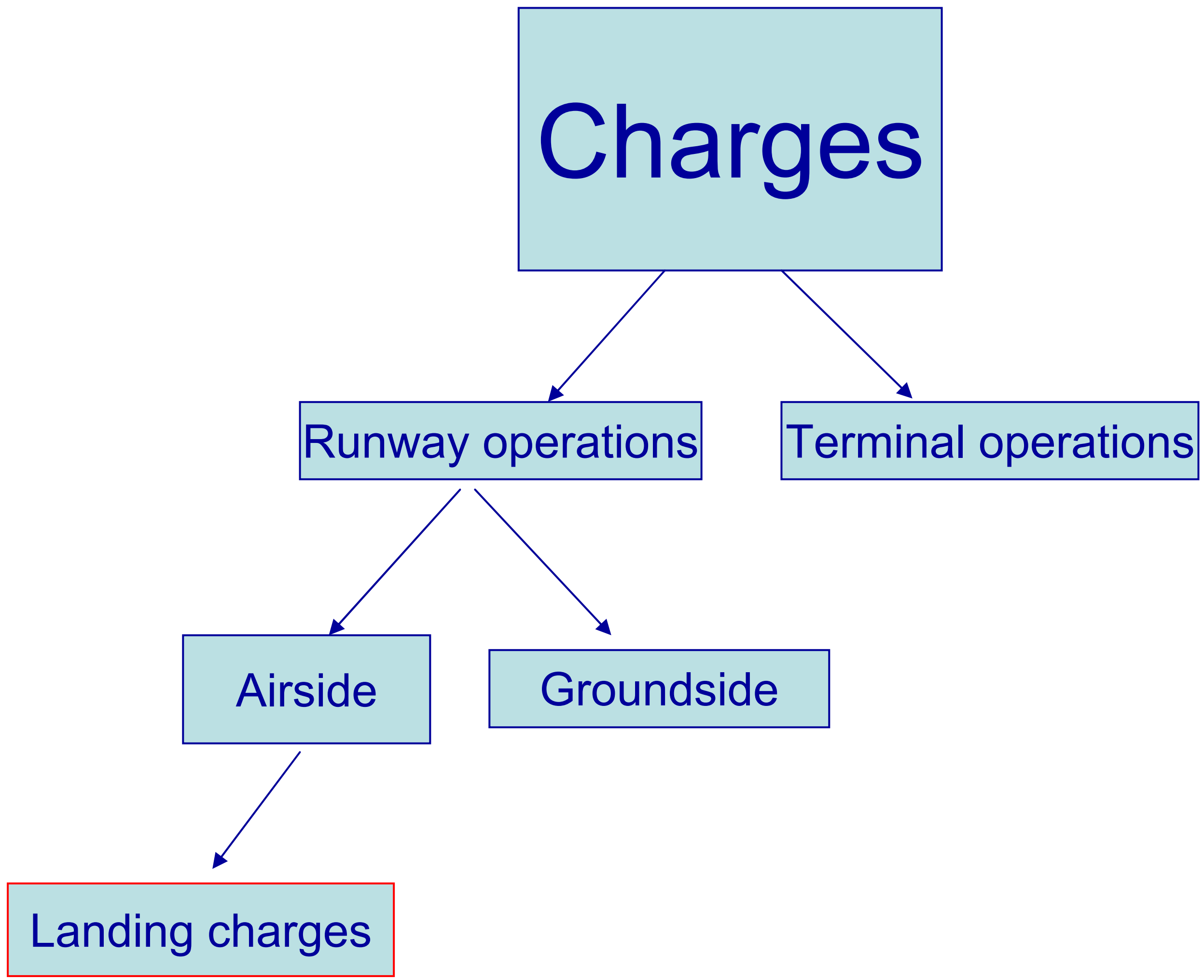
Varvara Simakova
Cristian Steffan
Markus Dinse

Supervised by:
Prof. Dr Jürgen Müller (FHW Berlin)

Outline

1. Airport‘s charging
   1. Charges‘ structure
   2. Pricing schemes
2. Definition of Ramsey pricing
   1. What is Ramsey pricing
   2. Definition of our calculation
3. Example of Ramsey pricing
   1. Example: Parametres
   2. Example: Calculation
   3. Example: Comparison
   4. Consequences
4. Problems
5. Reflection on Martin-Cejas work
6. Next steps

1.1 Charges' structure



1.2 Pricing schemes

1. Weight- & passenger-based charging (recommended by ICAO and applied)

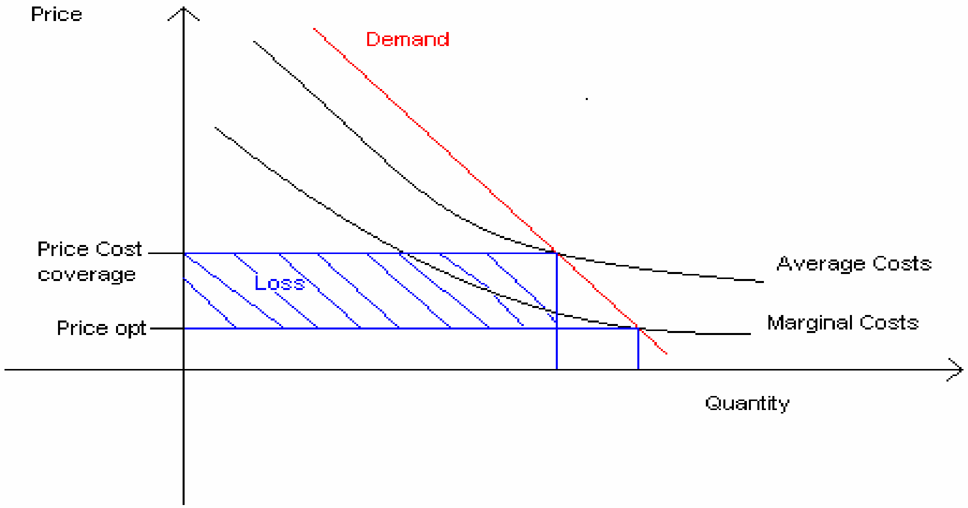
2. Pricing schemes
   1. Marginal cost pricing
   2. Peak pricing
   3. Ramsey pricing
   4. Two part tariff

2.1 What is Ramsey pricing?

- A calculation scheme to achieve cost coverage for natural monopolists
- Usually natrual monopolists maximise their profits by charging the price according to marginal costs.
- But what happens if average costs are higher than marginal costs?

Source: Martin-Cejas, R. R., Airport pricing systems in Europe and an application of Ramsey pricing to spanish airports

2.1 What is Ramsey pricing?



- As depicted, pricing to marginal cost will result in a loss in this case as average costs are higher than marginal costs.
- If capacity is not exceeded, airport‘s cost for additional demand is close to zero. Thus marginal cost pricing will lead to a loss.
- Therefore an alternative pricing scheme (second best pricing) is necessary, where price + subsidies (if there are any) are high enough to cover the average costs.
- Source: Martin-Cejas R. R., Airport pricing systems in Europe and an application of Ramsey pricing to spanish airports
- Source: Church and Ware, in Powerpointpresentation of Prof. Dr. Niemeier, H-M,

2.1 What is Ramsey pricing

- Ramsey prices are computed by charging inversly to elastcity of demand.
  Those with a high willingness to pay have to pay higher prices as those not willing to pay more.
- Thus it allows an adequate allocation of capacity and lowers the deadweight loss (which occurs if monopolists charge according to marginal costs.).

2.2 Definition of our calculation

- We used an approach due to R. R. Martin-Cejas' research in „ Airport pricing systems in Europe and an application of Ramsey pricing to spanish airports"
- The Ramsey formula is denoted:

$$p_i = \frac{\partial(TC)/\partial Q_i + (K/\eta_i)TC_i}{1 - K/\eta_i}$$

- *i*- denotes an aircraft type
- ηi- price elasticity of demand for passenger trips (demand for landings)
- Tci– Total cost of a flight: Depending on aircraftsize & flight distance
- δ(TC)/δQi- marginal cost; they result from differentiation of total operating costs, which are functions of distance
- *K*- λ / 1+λ, where λ – extent to which the revenue constraint is binding.

3.1 Example: Parameters

- Year: 2003
- Airport: DUS
- Aircraft: Airbus 320-200
- Flight distance
  - 1.000 Km
  - 3.000 Km
- Block hour operating costs: 4.790€/h
  Source:Eurocontrol
- Cruising speed: 840 Km/h
  Source: Airbus
- Runway length DUS: 5.400 metres

  Source: Airport DUS

- Average taxiing time: 0,22325
- MC of an air carrier landing at a German airport: 72 €
  Source: Eurocontrol
- Elasticity of demand ηi :

  Source: InterVISTAS Consulting Inc
  - 1.000 Km: 2,156
  - 3.000 Km: 1,120
- K: 0,0559
- Number of block hours per flight:
  - 1.000 Km: 1,413726
  - 3.000 Km: 3,794679

  Source: own calculation

3.2 Example: Calculation

- 1. Example – Flight distance: 1.000 Km

$$\frac{72€ + \dfrac{0,559}{2,156} * 4.790€}{1- \dfrac{0,0559}{2,156}} = 434,414€$$

- 2. Example – Flight distance: 3.000 Km
  - Ramsey price = 1.985,50 €

3.3 Example: Comparison

- To make Ramsey prices comparable we calculated the landing fee for the same aircraft, charged in reality.

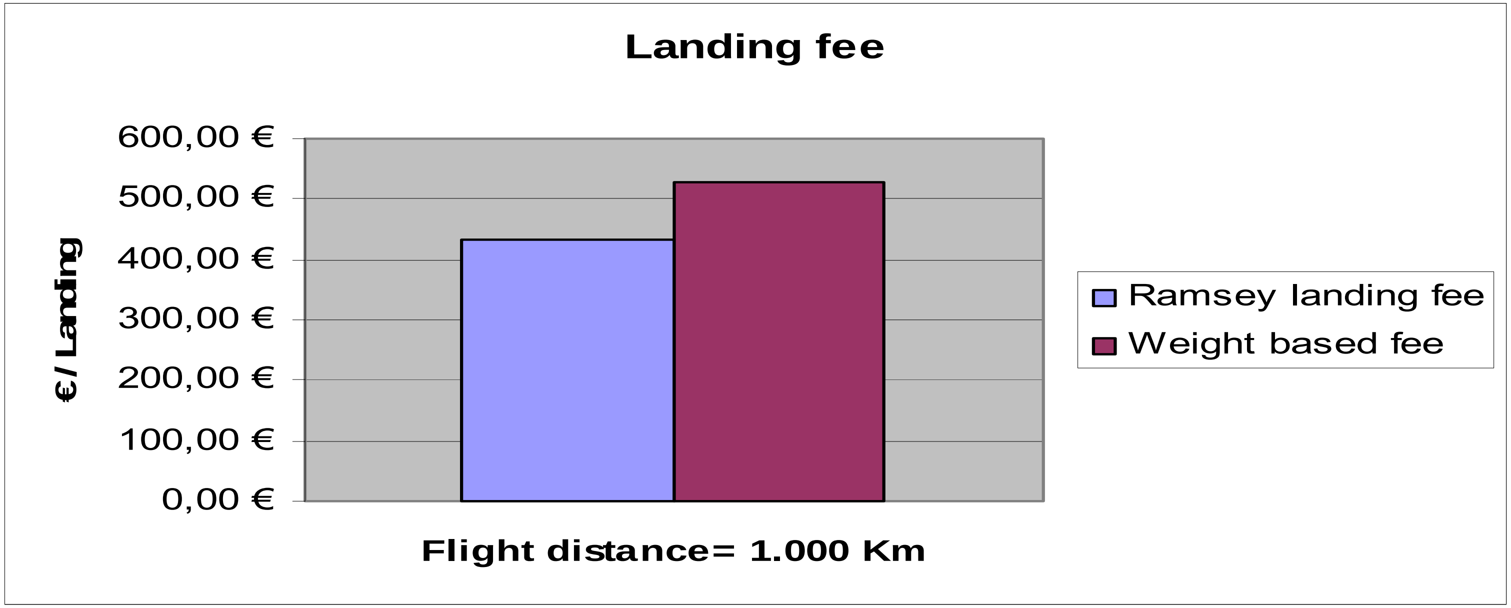
- In 2003 the landing fee for an
  Airbus A 320 – 200 was:
  221,00€ + 73,5 t * 4,15€ = **528,10€**

Sources: Airbus, Charges manual NfL I – 207/02

3.3 Example: Comparison

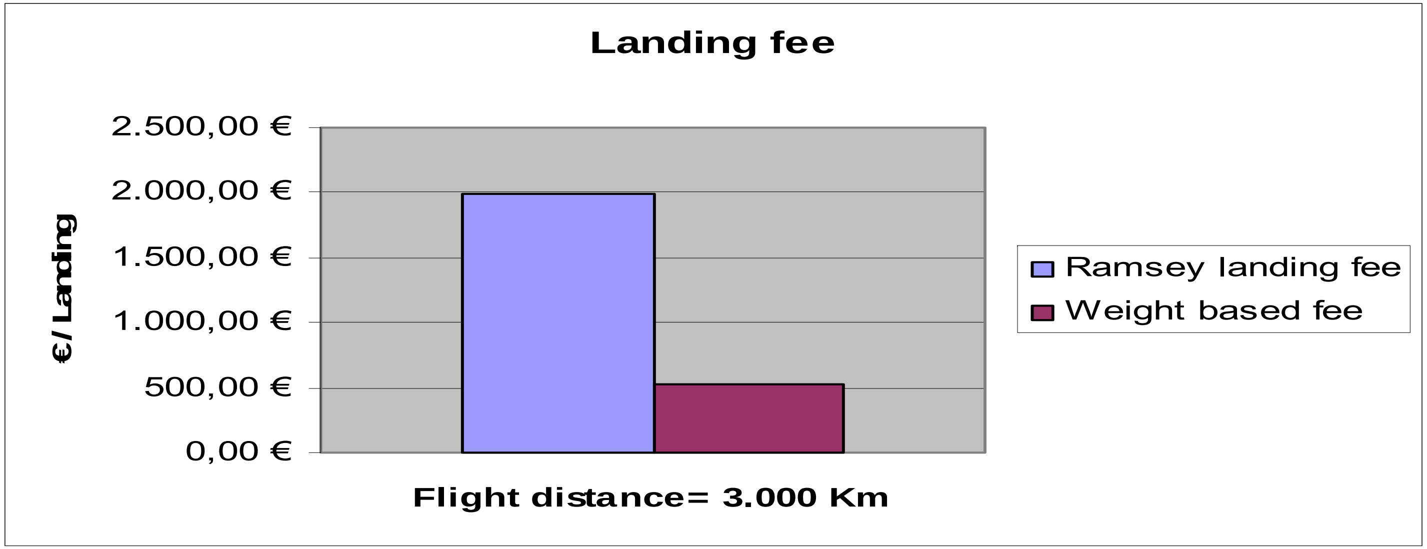
- Result:

  At a flight distance of 1.000 Km weight-based charging leads to 21,57% more revenue as Ramsey pricing.



3.3 Example: Comparison

- But if flight distance increases to 3.000 Km, the airport will benefit massively from Ramsey praicing due to the lower elasticity of demand and gain about 376% more revenue than by using weight-based charging.



3.4 Consequences

- If a Ramsey pricing system is adopted long-distance flights will become more expensive, especially for small aircrafts.

- Contrary to this, short-distance flights will become cheaper, especially for large aircrafts.

- But in reality small air carriers don‘t do long-distance flights, neither do large aircrafts short distance flights.

4. Problems

- Hard to implement in reality.
  - Have airports the marketpower to implement such a pricing scheme?
  - It is difficult to get the necessary data.
- Even if airports have the market power to do so, there are legal barriers which prohibit charging different prices for the same service such as:
  - Art. 82 EGV Satz 2 a, c
  - § 19 (4) Nr. 3 GWB
  - § 20 (1) GWB

Source: Requate, Till, Preisdiskriminierung
Additional Source: Sylvester Damus, Ramsey pricing by U.S. Railroads(1984)

5. Reflection on Martin-Cejas‘ work

- In our opinion, some figures which Martin-Cejas used could be improved:
  - The elasticity should reflect airline‘s demand for capacity, not passenger‘s.
  - In Germany airports do not charge according to flight distance, so this term should be replaced in the block hour price-calculation as well.
  - Generally it is doubtfull to use block hour costs for handling an air carrier in this equatation

6. Next steps

- Apply same calculations for small, regional airports
- Calculate an airline-elasticity
- What are the effects of a pricing scheme based on flight distance?
  - Who will get better/worse off by applying this approach?

Thank you very much, for your attention