

Airport Congestion Pricing

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Master Thesis (work in progress)

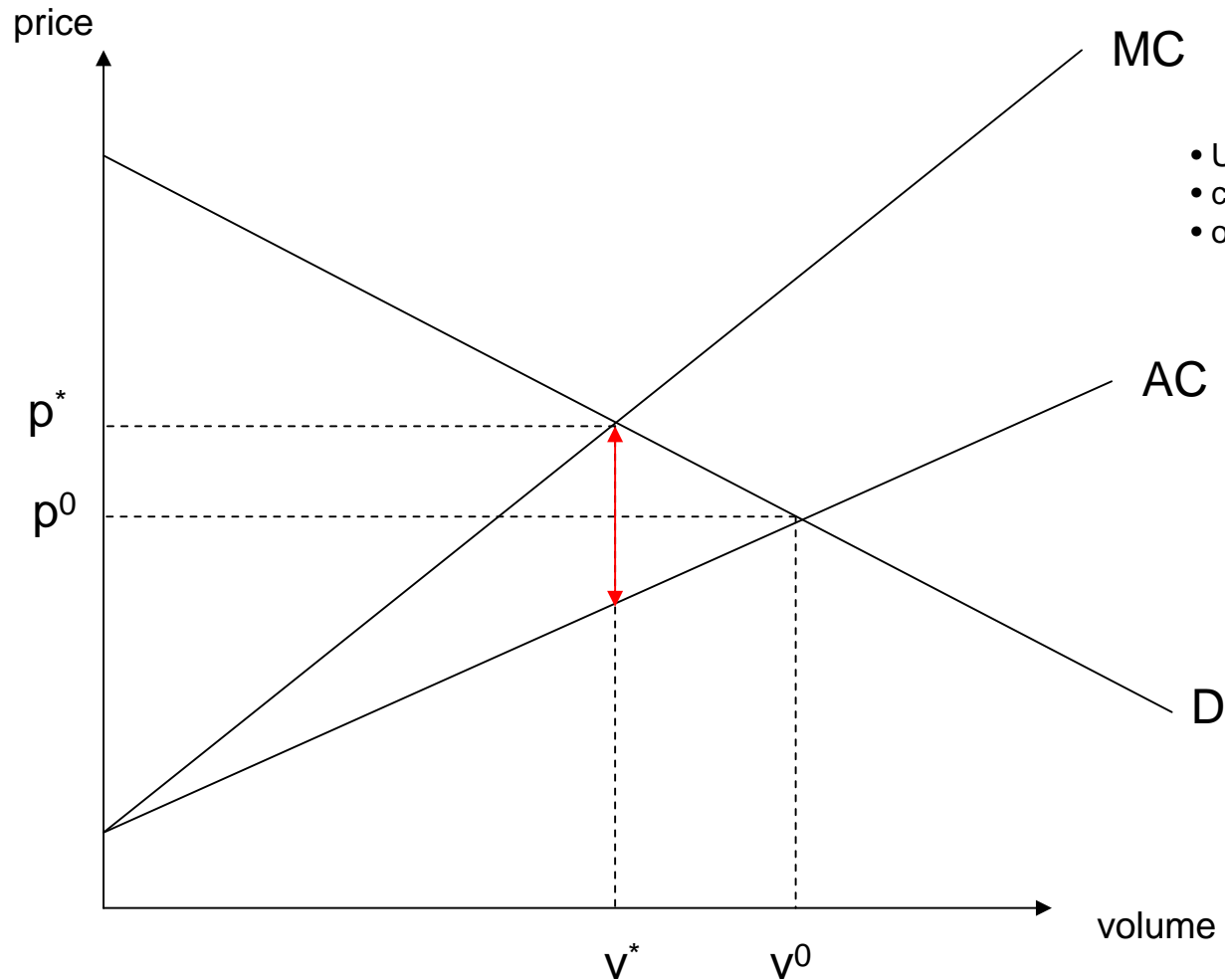
Structure

- Congestion pricing in general
- Characteristics of airports
- Airport congestion pricing
- Some empirical evidence
- Conclusion and outlook

Research question

How does airport pricing contribute to rationing scarce airport capacity? What is the goal of the pricing mechanism?

Congestion pricing



- Users take into account AC
- congestion pricing to cover marginal cost
- optimal level of users (volume) and price

Congestion pricing

- Weight-based pricing at many airports
- Bottleneck situation
 - Economically efficient allocation of capacity
 - Congestion charges induce users to take into account the congestion externality they impose on others
 - Incentives for investment in capacity
- However, marginal costs difficult to calculate
- This pricing scheme might face strong opposition from airline operators and other parties involved

Characteristics of airports

- Link-based pricing vs. node-based pricing
- Entry conditions
 - Free entry vs. negotiations
- Users
 - Atomistic vs. oligopolistic/ monopolistic
- Hub-and-spoke networks

Airport congestion pricing

- Daniel (1995, 2001)
 - Stochastic queueing (bottleneck) model
 - Peak spreading throughout the day
 - Small aircraft/ general aviation might divert traffic to other airports
 - Composition of aircraft types changes
 - Welfare gains

Airport congestion pricing

- Brueckner (2002)
 - Airlines are non-atomistic
 - Congestion costs = passenger time costs and airline operating costs
 - Different types of travellers (business and leisure) → benefit function
 - Monopolistic carrier
 - Oligopolistic carrier

$$t = c_{\text{cong}}^*(1-ms)$$

Airport congestion pricing

- Pels/ Verhoef (2004)
 - Analysing the effect of market power of airlines on optimal toll (simple symmetric network)
 - Cournot duopolists maximise profits
 - Regulator maximises social welfare
 - Market power effect vs. congestion effect
 - Second-best tolls under these assumptions can be lower than what a pure congestion toll would suggest

Airport congestion pricing

- Mayer/ Sinai (2003)
 - Hub-and-spoke networks
 - Hub carrier: marginal benefits of hubbing = marginal delay (congestion) costs
 - Empirical evidence from Dallas-Fort Worth airport
 - Airports with low concentration have higher delays than hub airports
 - At hub airports hub carriers face higher delays than non-hub carriers

Some empirical evidence

- Boston Logan Airport (BOS)
 - Programme rejected
- New York Airports (JFK, LGR, EWR, TEB)
 - Prices targeted at a particular group and not market based
- London (LHR)
 - More in line with economic principles,
 - Small carriers priced off
 - BAA is phasing out peak load pricing

Conclusion and outlook

- Weight-based pricing not efficient when it comes to rationing scarce capacity/ excess demand
- Modified results than those from road pricing
- Take into account different effects (internalization, market power, hub-and-spoke network)
- How to use the pricing mechanism (peak/ congestion pricing) to allocate demand efficiently?

Thank you for your attention.