Non-Aviation Revenues, Infrastructure Improvements, and the Need for Regulating Airport Charges

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Outline

- The airport business
- Model
- Results
- Conclusion

The airport business

- Worldwide trend towards airport privatization
- Privatized airports: persistent monopoly power in providing aeronautical services

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Regulation of aeronautical charges

The airport business

- Charges for commercial services are not subject to any direct form of regulation
- Non-aviation business has become increasingly important to airports

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Incentive for monopolistic airports to abuse market power? / Need for regulation?

Model

- Non-congested, unregulated monopolistic airport
- Approached by one airline
- Air carrier = monopolistic supplier of air transport ⇨ has to pay a landing fee

Model

- Demand for tickets is represented by

$$x = D - \alpha p_c$$

where $D > 0, \alpha > 0$ and $p_c > 0$ is the ticket price

- Airport revenues = aviation + non-aviation revenues

Model

- Aviation revenues: $p_a \cdot x$ where $p_a > 0$ is the landing fee
- Non-aviation-revenues: $s \cdot \beta x$

⇒ one commercial product

⇒ each passenger buys a quantity of $0 < \beta \leq 1$ of the commercial good

⇒ $s > 0$ locational rent

Model

- Airport competes with providers of commercial goods and services in the airport's hinterland

➡ locational rent depends on the accessibility of those providers

➡ passengers could travel to the competitive hinterland and consume there at a lower price that equals marginal costs, i.e.,

$$s = 0$$

Model

- Airport competes with providers of commercial goods and services in the airport's hinterland

➡ passengers consuming in the hinterland would have to bear transport costs $\delta(d,t)$ where $\partial\delta/\partial d > 0$ and $\partial\delta/\partial t > 0$

➡ locational rent earned by the profit-maximizing airport adds up to $s = \delta$

Model

- The airport's costs consist of fixed costs that include capital costs:

$$F > 0; F^{Aero} = \lambda F; 0 < \lambda \leq 1$$

- The airport maximizes the profit for the forthcoming flight period:

$$\max_{p_a} \Pi = (p_a + s\beta) \cdot x - F$$

Model

- The air carrier maximizes its profit:

$$\max_{p_c} \Pi = (p_c - c) \cdot x(p_c)$$

where $c = p_a$

- Sequential game:
  - ➡ Airport = first mover
  - ➡ Air carrier = second mover
  - ➡ Solution by backward induction

Results

- Profit maximization by the airport results in an optimal landing fee charged to the airline:

$$p_a^* = \frac{D - \alpha\beta s}{2\alpha}$$

→ optimal landing fee is decreasing in the degree of complementarity of aviation and non-aviation at the airport, β

Results

- Profit maximization by the airport results in an optimal landing fee charged to the airline:

$$p_a^* = \frac{D - \alpha\beta s}{2\alpha}$$

1. *A monopolistic airport that generates income both from aeronautical and commercial activities has an incentive to restrain landing fees.*

Results

- Profit maximization by the airport results in an optimal landing fee charged to the airline:

$$p_a^* = \frac{D - \alpha\beta s}{2\alpha}$$

➡ optimal landing fee is decreasing in the locational rent earned by the airport,

$$s = \delta$$

Results

- Profit maximization by the airport results in an optimal landing fee charged to the airline:

$$p_a^* = \frac{D - \alpha\beta s}{2\alpha}$$

2. *Infrastructure improvements that facilitate the accessibility of providers of commercial services in the airport's hinterland will increase landing fees*.

Results

- Comparing the optimal landing fee to the landing fee that a regulator would approve, $p_a^{reg} = \lambda F / x(p_a^{reg})$, yields:

$$p_a^* \begin{array}{c} < \\ = \\ > \end{array} p_a^{reg} \quad \Leftarrow \quad s \begin{array}{c} > \\ = \\ < \end{array} \frac{\sqrt{D^2 - 8\alpha\lambda F}}{\alpha\beta} = \hat{s}$$

as long as $F \leq D^2 / 8\alpha\lambda$

Results

- Comparing the optimal landing fee to the landing fee that a regulator would approve, $p_a^{reg} = \lambda F / x(p_a^{reg}),$ yields:

3. *At a profit maximizing monopolistic airport with fixed costs* $F \leq D^2/8\alpha\lambda$ *the optimal landing fee will be lower than the regulated landing fee if the locational rent is sufficiently high.*

Conclusion

- As long as locational rents are sufficiently high, monopolistic airports will not take advantage of their market power.

  ➡ price regulation is inappropriate

- If locational rents fall below a critical level after infrastructure improvements have been realized, airports will abuse their market power.

  ➡ price regulation will become appropriate

Thank you for your attention!