Airports as two-sided platforms, consequences for regulation

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Airports Business Model

Airports: what do they do?

- Airports are suppliers for airline companies
  - allocation of slots
  - payment of charges (landing, passengers)
  - payment of services (ground handling, use of facilities, security...)
  - around 60% of the total revenues
Airports Business Model
Airports: what do they do?

- Airports are customers for airline companies
  - commercial activities ++ increase
  - parking
  - rental cars intermediate
  - shops inside the terminals
  - more than half of the profit for big infrastructures
Airports Business Model

Heathrow airport, 2017

- Non Aero revenues $13/PAX
  - VIP lounge/car rental $3/PAX
  - Restaurants/shops $6/PAX
  - Parking $2/PAX
  - Express train $2/PAX

Motivation: Airports as business players

Paper contribution: Airports as platforms

Literature:

Main results and conclusion
Air Transport Market
ADP financial results 2009-2014
Main contribution of the paper

The paper contribution

- Airports play the role of a platform between shops and passengers
  - Two-sided market analysis, with regulation
  - The commercial and aeronautical activities are related with each other through externalities
- Single till regulation is the best way to take into account the problem of externalities
- Assessment of the impact of the externalities on the price structure (helpful for regulation)
Airports as two-sided markets

Airports make passengers and shops meet

Aeronautical activities

Passengers

Airport

Commercial Activities

Sets rents

Shops/parking/car renting

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Airport as two-sided markets

Role of the regulator

- Aeronautical activities
  - Regulator
    - Sets price cap
  - Airline(s)
    - Sets aero price
    - Sets ticket price
      - And/or connecting time
  - Passengers
- Commercial Activities
  - Airport
    - Sets rents
  - Shops/parking/car renting

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Airports: two types of regulation

Single Till regulation

- principle: include every single cost/revenue in the area of regulation when setting the aeronautical charges
- recommended by ICAO: article 15 of Chicago convention; document 9082 on policies on airport charges and air navigation services; document 9562 on airport economics manual
- supported by IATA
Airports: two types of regulation

Dual Till

- principle: sets price cap for the regulated business excluding the other activities (revenues+costs)
- adopted (and pushed!) first by the Australian airports
- now in place for many airports (Schipol, Fraport, Manchester, Budapest...)

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Airports: a third option?

Adjusted Dual Till

- principle: sets price cap for the regulated business excluding the other activities (revenues+costs) BUT let the airport choose what to add in the area of regulation
- Adopted mainly in France for the big airports (6)
- ex: Nice airport (still not validated) proposed to include in a discretionary fashion part of the commercial profits
- ex: Paris Airport: including parking revenues only
Related to regulation of airports

- Starkie and Yarrow (2001), Starkie (2002): single till is not so good because gives wrong incentives in terms of investment (cost of capital model)
  - no externalities
- Czerny (2004): single till is better to maximize welfare at non-congested airports (not two-sided)
- Torres, Dominguez, Valdes and Aza (2005): show a positive (and significative) correlation between waiting time and commercial expenditure at airports
  - shops demand depends as well on the connecting time
Related to two-sided markets analysis

- usage externalities; Wright (2004)
- Armstrong (2002): platform competition
- The airport is a (regulated) monopolist
- Anderson-Coate (2005): welfare analysis
- Weyl (2006)
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Air Transport Market

Airport as two-sided platforms

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Market for aeronautical services

- Passengers express their demand for travel:
  \[ N(p, t) \]

  where \( p \) is the price of the ticket and \( t \) is the connecting time

  → the higher the price \( p \), the less the demand for travel (direct effect)
  → the higher the connecting time \( t \), the less the demand for travel
  → price and time are imperfectly substitutable i.e.
  \[ \frac{\delta^2 N(p, t)}{\delta p \delta t} < 0 \]
Market for aeronautical services

- Airlines choose \( t \) and \( p \) in order to maximize their profits, given the demand for travel

Revenues:
- all coming from selling the tickets at price \( p \)

Costs:
- aeronautical costs/taxes + production costs
  - choosing a high \( t \) allows to produce at a lower cost
  - choosing a high \( p \) decreases the demand (local monopolies)
Market for commercial services

➤ Shops express their demand for space inside the airport

\[ s(r, N, t) \]

where \( r \) is the rent for the space, \( N \) is the number of passengers, \( t \) is the waiting time

→ the higher the rent, the lower the demand for space (direct effect)

→ the higher the number of passengers, the higher the demand for space (positive externality)

→ the longer the connecting time, the higher the demand for space (positive externality)

⇒ there exist external effects between the aeronautical and the commercial activities.
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Time line

Regulator sets price cap $a_{max}$

Airport chooses $r$ and $a$

Airlines choose $p$ and $t$

Passengers buy their ticket

Shops rent their location
Main Results

- Role of the connecting time

\[ \frac{\delta \Pi}{\delta t} = 0 \Leftrightarrow p - a - \frac{\delta C}{\delta N} = \frac{\delta C}{\delta t} / \frac{\delta N}{\delta t} \]

The airline sets \( t \) comparing

- gains in terms of cost from increasing the connecting time
- costs in terms of number of passengers of increasing their waiting time
- The airline does not internalize the fact that \( a \) is influenced by \( t \)
Main Results

Profits
The airport makes at least as much profit as in the dual till situation

Not clear-cut effect on a
The single till aeronautical tax can be lower or higher depending on which effect (waiting time or passengers) has a superior effect

▶ Two positive externalities are coming from the aeronautical side: waiting time + number of passengers
▶ However, the waiting time has a negative impact on passengers demand
Main Results: price structure is affected by the presence of the externalities

Rent
The rent of the shops is higher (always) because shops are benefiting from the externalities

Ticket price
The price of the ticket is lower if the aeronautical tax is lower (inducing a lower number of passengers)

Connecting time
The waiting time is higher if the aeronautical tax is lower (inducing a lower number of passengers)
Main Results: price structure is affected by the presence of the externalities

Regulation

- Single till is optimal: it allows to internalize the side effects of passengers on shops. Total surplus is higher.
Extensions

Optimal Regulation

▶ other reasons for Single Till regulation
  ▶ nature of the costs: ++ fixed costs, not easily attributable to one activity or another
  ▶ asymmetric information: ++ in case of privatization