Expanding Airport Capacity under Constraints in Large Urban Areas: The German Experience

Prof. Dr. Hans-Martin Niemeier

Roundtable on “Expanding Airport Capacity under Constraints in Large Urban Areas” of the International Transport Forum at the OECD 21-22 February 2013, Paris
Niemand hat die Absicht, einen Flughafen zu eröffnen!
Issues

• Airport expansion a hot potato

• Five research questions:

1. How have German airports extended capacity? Has capacity been expanded on an optimal scale and time?

2. What are the key problems of airport investment?

3. How have investment decision been assessed? By what methods?

4. What are the strength and weaknesses of the German decision process?

5. What can be learned?
I. Overview and Case Studies on Investment of German Airports

II. Key problems of Airport Investment

III. Assessment of Decisions on Capacity Expansion of Airport: Strengths and Weaknesses

IV. Summary and Recommendations
I. Investment

Passenger and freight of German airports

Source: ADV

Prof. Dr. Hans-Martin Niemeier
I. Investment: Six airports

Passengers

Source: ADV
## I. Investment

<table>
<thead>
<tr>
<th>Airport</th>
<th>BBI</th>
<th>DUES</th>
<th>HAM</th>
<th>FRA</th>
<th>MUC</th>
<th>STR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location chosen/open</td>
<td>1996/past 2015</td>
<td>1914/19 27</td>
<td>/1911</td>
<td>1934/19 36</td>
<td>1969/19 92</td>
<td>1936/19 39</td>
</tr>
<tr>
<td>Runway extensions (year/ km)</td>
<td>N.A</td>
<td>1952/19 69 up to 3 km</td>
<td>1935- 64 3,3/3,6 km</td>
<td>1957- 60/ 3,9 3 km</td>
<td>NA</td>
<td>1951- 1996 to 3,3 km</td>
</tr>
<tr>
<td>Public planning/constr.</td>
<td>At least 19 years</td>
<td>24 years 2 nd rw</td>
<td>3 years apron</td>
<td>22 y, 3. rw/10 y. 4 rw</td>
<td>13 y. planning</td>
<td>NA</td>
</tr>
<tr>
<td>Mediation</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Slots 1992 - 2012</td>
<td>NA</td>
<td>34 to 43 26,5 %</td>
<td>42 to 51 21,4 %</td>
<td>66 to 91 37,8 %</td>
<td>68 to 90 32,3 %</td>
<td>24 to 42 81,8 %</td>
</tr>
</tbody>
</table>

Source: ADV

Prof. Dr. Hans-Martin Niemeier
I. Investment: Peak capacity

Maximum Number of Coordinated Movements

- Düsseldorf
- Frankfurt
- Hamburg
- Munich
- Stuttgart

Prof. Dr. Hans-Martin Niemeier
I. Introduction:

- Airports have wasted resources in building runways for intercontinental traffic

Table 1: Profitability of Long haul runways at secondary European Airports in 2007

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Spain</th>
<th>UK</th>
<th>EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially profitable</td>
<td>30%</td>
<td>19%</td>
<td>71.4%</td>
<td>26%</td>
</tr>
<tr>
<td>Unprofitable</td>
<td>50%</td>
<td>19%</td>
<td>14.3%</td>
<td>27%</td>
</tr>
<tr>
<td>No long haul flights at all</td>
<td>20%</td>
<td>62%</td>
<td>14.3%</td>
<td>48%</td>
</tr>
<tr>
<td>Number of Airports</td>
<td>10</td>
<td>16</td>
<td>7</td>
<td>113</td>
</tr>
</tbody>
</table>

Source: Based on Maertens (2009 and 2010)

- Münster-Osnabrück Airport
  - applied for public approval for runway from 2,2 Km to 3,6 Km
  - Agreement on a runway of 3,000 meter in 2011
  - Less than 1 Million passenger
I. Investment: Entry & Exit

1995 - 2012

- 10 Entries
- 3 Exits
- Not reduced excess demand

Source: Niemeier, 2012
I. Introduction

- Location of major airports chosen before the Second World War.
- 50/60 ties: To changes in technology & demand public airports reacted in the with an runway extension.
- 70 ties: Conflicts emerged with the growth of cities and stepwise extensions, more movements & noise of first jets
- 70/80 ties: Conflicts accelerated & caused even violent protest.
I. Introduction

- Mediation limited use in Berlin, major role in Frankfurt.
- Conflicts led to long planning processes, demonstrations and court decisions. Still unresolved.
- Capacity have become scarce only at a few airports. There is evidence for excessive investment in intercontinental capacity and in regional airports.
- Capacity has increased substantially sometimes at high costs (chemical plant removal at FRA, 2 billion cost overruns at BBI)
II. Key Problems

• Transaction cost perspective:

➢ Airports are long term relationship specific investments plagued with hold up problems, opportunism, externalities and imperfect information.

➢ Costs and benefits are unevenly distributed in space and lead to NIMBY reactions in the direct neighbourhood of airports.
II. Key Problems

- Airport & Regulatory Economics:
  - German airports have expanded their capacity under a regime of cost based regulation and slot coordination.
  - Regulation and slots break the link between scarcity and pricing so that prices lose their signalling function for investment.
  - Cost based regulation sets incentives for inefficient pricing and for excessive and too costly investment.
  - The lack of independent regulation leads to regulatory capture and rent seeking.
II. Key Problems

- Mega project economics:
  - Airport investments might turn into mega projects with benefit shortfalls and/or cost overruns.
  - The failure of mega project is due to the lack of public sector or private sector accountability.
  - Public control and transparency are not implemented or competition does not work effectively.
  - Cost Benefit Analysis and forecasts should be made by independent organizations and be peer reviewed.
  - Private risk capital should be involved in the project.
III. Assessment: Strength

- The planning process has democratic legitimation.

- It addresses the conflict of interest and with approval decision controlled by the court.

- It provides stakeholders with planning security to invest in long term relation specific objects.
III. Assessment: Weaknesses

• Planning process lacks
   ➢ full compensation & encourages neighbours to take all legal & political action.
   ➢ an independent planning authority. Quasi-independence is not accepted by citizens.
   ➢ long term commitment.

• Mediation can compensate partly lack of independency of the planning institution, but
   ➢ recommendations are not legally binding.
   ➢ poor Berlin Brandenburg airport and better though not of a sufficient quality in Frankfurt.
III. Assessment: Weaknesses

• Investment decisions are not assessed by Cost Benefit Analysis, but by Impact Analysis.

- BBI P: 30 Mio PAX. Inputs: 2.8 Bill €
  - direct: 17.000, indirect: 11.300, induced: 12.200 jobs = 31500 jobs (Baum et al. 2005)

- BBI B: 30 Mio PAX Inputs: 5.6 Bill €
  - direct: 32.00, indirect: 22600, induced: 24.400 = 63000 jobs (Niemeier, 2013)
III. Assessment: Weaknesses

• Investment decisions are not assessed by Cost Benefit Analysis, but by Impact Analysis.

  ➢ Direct & indirect effects of are greater the more costly and unproductive an airport is. Induced effect is independent of the investment object.

  ➢ Impact Analysis creates the ideology that jobs can only be created if noise and environmental burdens are accepted.

  ➢ Impact Analysis is intentionally misused by airports to legitimize investment and to delude the public.

  ➢ Geffray Gazzard of Friends of the Earth (1999, p. 6): UK Advertising Standards Authority ordered Manchester Airport to withdraw the claim that 48,000 jobs would be created by the second runway.
III. Assessment: Weaknesses

• The planning process of airports
  - lack a vigorous ex-ante and ex-post evaluation of forecasts.
  - tends to reduce airport competition & encourages rent seeking to erect legal barriers of entry.

  ➢ BBI airport under private or public ownership regime monopolized the market and prevented entry of LCC airport
III. Assessment: Weaknesses

- Negative externalities of airport expansion are not efficiently addressed
  
  ➢ Efficient or acceptable noise budgets are not implemented at German airports.

  ➢ After 36 years German law for Noise Protection has been reformed with improved noise protection norms, but with no legal binding exposure thresholds.
### III. Assessment: Weaknesses

<table>
<thead>
<tr>
<th>Airport</th>
<th>Berlin Brandenburg</th>
<th>Düsseldorf</th>
<th>Hamburg</th>
<th>Frankfurt</th>
<th>Munich</th>
<th>Stuttgart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Night curfew hrs</td>
<td>23 to 5:00</td>
<td>24 to 6:00</td>
<td>24 - 6 pm</td>
<td>23 - 5:00</td>
<td>24- 5.00 Noise &amp; movement budget</td>
<td>24.– 6.00</td>
</tr>
<tr>
<td>Restrictions for louder aircrafts</td>
<td>NA</td>
<td>Yes, 23 - 6.00</td>
<td>Yes, 23:00 -24</td>
<td>Yes 22 – 24; 5- 6</td>
<td>Yes, 23.30-24.</td>
<td></td>
</tr>
<tr>
<td>Noise surcharge</td>
<td>NA</td>
<td>Yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Demand of initiatives</td>
<td>22.00 – 6.00</td>
<td>22:00 - 7:00</td>
<td>22.00 7.00</td>
<td>22-6.00</td>
<td>22-6.00</td>
<td>22.00-7.00</td>
</tr>
</tbody>
</table>

- Noise budget set at an efficient or at a politically acceptable level have not been implemented although they seem to be suitable for the time from 22.00 to 24.00 and 5.00 to 7.00 hrs.
- Noise surcharges have been reformed though rather late and still do not lead to any measurable substitution effects.
III. Assessment: Weaknesses

• Does limiting capacity expansion at Frankfurt hub endanger the competitive position?
  ➢ Answered by mediators, but without vigorous assessment

• Overall, planning system has led to
  ➢ avoidable transaction costs
  ➢ costly and inefficiently used infrastructure
  ➢ avoidable environmental costs.

• No wonder that investment in airports has been criticized by a large group of citizens not confined to a few living under the flight paths of airports.
IV. Recommendations

1. Independent planning authority separated from the owners of airports
2. Open and transparent planning process
3. Compensation of directly negative affected citizens
4. Mandatory ex-ante & post controlled CBA
5. Market based environmental policy
6. Reforming governance structure: more competition, less subsidies, independent economic regulator, better pricing of scarce capacity

Thank you very much