Key Findings: 2017 ATRS Global Airport Performance Benchmarking

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Key Findings

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Outline

- Objective of the ATRS Benchmarking Study
- Airports Included and ATRS Database
- Characteristics of Sample Airports
- Methodology
- Key Results on Efficiency and Cost Competitiveness
Objective of the Benchmarking Study

- To provide a comprehensive, unbiased comparison of airport performance focusing on
  - Productivity and Operating/Mgt Efficiency
  - Unit Cost Competitiveness
  - Comparison of Airport Charges

- Limitation: Service Quality is not considered
## Airports included in the 2017 Report

<table>
<thead>
<tr>
<th>Region</th>
<th>Airports</th>
<th>Airport Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada-US</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>71</td>
<td>15</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38 Asian airports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 Oceania airports</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>206</strong></td>
<td><strong>24</strong> airport groups</td>
</tr>
</tbody>
</table>
The ATRS Database

- The ATRS Database contains historic information (FY 2002-2015) including financial data, traffic and capacity data of the major airports and airport authorities (groups) in the following geographic regions:
  - Asia Pacific
  - Europe
  - North America

- The data in each region is segregated into:
  - Airport Information (capacity, type of ownership etc)
  - Traffic
  - Aeronautical Revenue
  - Non-Aeronautical Revenue
  - Operating Expense
  - Balance Sheet

Airport Characteristics

- Number of passengers ranges from 861,982 passengers for Dunedin International Airport (New Zealand) to 101 million passengers for Hartsfield-Jackson Atlanta International Airport (United States) in 2015.
- 40 airports with only 1 runway, and 7 runways at DFW and 8 at ORD
- Number of Employees ranges from 19 (Queenstown) to 15,929 (Frankfurt)
- 12 airports serve only international passengers, and international passengers account for less than 10% of total traffic at 60 airports
Passenger Traffic, 2015

Largest Five and Smallest Five (‘000)
Passengers per Aircraft Movement, 2015

Highest Five and Lowest Five

Europe
North America

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Highest Five and Lowest Five

% OF Non-Aeronautical Revenue, 2015

Europe

North America
• **Variable Factor Productivity (VFP) Index**
  – Total Factor Productivity (TFP) - Impossible because of capital input cost accounting problem

• VFP is essentially the ratio of total (aggregate) output index divided by total (aggregate) variable input index, namely labor and soft cost input (total non-labor variable inputs).

• VFP is computed using the **multilateral index** procedure proposed by Caves, Christensen and Diewert (1982).
Multilateral Index Procedure

- This multilateral output (input) index procedure uses the revenue (cost) shares to aggregate output (inputs)

\[
\ln \frac{Y_i}{Y_j} = \sum \frac{R_{ki} + \bar{R}_k}{2} \ln \frac{Y_{ki}}{\bar{Y}_k} - \sum \frac{R_{kj} + \bar{R}_k}{2} \ln \frac{Y_{kj}}{\bar{Y}_k}
\]

\[
\ln \frac{X_i}{X_j} = \sum \frac{W_{ki} + \bar{W}_k}{2} \ln \frac{X_{ki}}{\bar{X}_k} - \sum \frac{W_{kj} + \bar{W}_k}{2} \ln \frac{X_{kj}}{\bar{X}_k}
\]
Methodology

Inputs
- Labour
- Other non-capital (soft-cost) input

Outputs
- Aircraft movement
- Passenger
- Non-aeronautical revenue
- (Cargo)

Gross Variable Factor Productivity
Factors Beyond Managerial Control:

- Airport size (Scale of aggregate output)
- Average aircraft size
- Share of international traffic
- Share of air cargo traffic
- Extent of capacity shortage - congestion delay
- etc

Residual (Net) variable factor productivity (RVFP) is computed after removing effects of these Factors
Cost Competitiveness

• An airport enjoys lower unit costs than other airports when that airport is more efficient, or pays less for its inputs, or both

• A cost competitiveness indicator is constructed by summing the effects of variable input price and the effects of efficiency in using these variable inputs.
Key Results

Figure S-4a1 Residual Variable Factor Productivity (2015), Asia, HKG=1.0
Over 40 million passengers per Year

Figure S-4a2 Residual Variable Factor Productivity (2015), Asia, HKG=1.0
10-40 million passengers per Year

Figure S-4a3 Residual Variable Factor Productivity (2015), Asia, HKG=1.0
Under 10 million passengers per Year
**Key Results**

Figure S-4a4 Residual Variable Factor Productivity (2015), Oceania, SYD =1.0

Figure S-4a5 Residual Variable Factor Productivity (2015), Asia Pacific, HKG=1.0
Airport Groups

- KAC
- APAC
- ADG
- QAL
- API
- APII
- MAHB
- AAI
- AOT
Key Results

Figure S-4b1 Residual Variable Factor Productivity (2015), Europe: Over 25 million Passengers per Year, CPH=1.0

Figure S-4b2 Residual Variable Factor Productivity (2015), Europe: 10-25 million Passengers per Year, CPH=1.0
Key Results

Figure S-4b3 Residual Variable Factor Productivity (2015), Europe: under 10 million Passengers per Year, CPH=1.0

Figure S-4b4 Residual Variable Factor Productivity (2015), Europe: Airport Groups, CPH=1.0
Key Results

Figure S-4c1 Residual Variable Factor Productivity (2015), North America: Over 40 Million Passengers per Year, YVR=1.0

Figure S-4c2 Residual Variable Factor Productivity (2015), North America: 25-40 Million Passengers per Year, YVR=1.0
Key Results

Figure S-4c3 Residual Variable Factor Productivity (2015), North America: 10-25 Million Passengers per Year, YVR=1.0

Residual VFP
Top Efficiency Performers (2017)

Asia Pacific:
- Over 40 million passengers per year: Hong Kong
- 10-40 million passengers per year: Jeju International
- Under 10 million passengers per year: Guam
- Oceania Airports: Sydney
- Airport Groups: Korea Airport Corporation

Europe:
- Over 40 million passengers per year: Amsterdam
- Over 25 million passengers per year: Copenhagen
- 10-25 million passengers per year: Athens
- Under 10 million passengers per year: EuroAirport
- Airport Groups: Schiphol
North America (Canada/US):

- Over 40 million passengers per year: Atlanta, Charlotte,
- 25-40 million passengers per year: Minneapolis/St Paul,
- 10-25 million passengers per year: Vancouver International
- Under 10 million passengers per year: Kahului Airport,
Key Results

- Cost Competitiveness
Key Results
Key Results
Key Results
Key Results

Figure 5.4c1 Cost Competitiveness 2015 - North America
YVR=0.0
Over 40 million Passengers per Year

Figure 5.4c2 Cost Competitiveness 2015 - North America
YVR=0.0
25-40 million Passengers per Year
Key Results
Top Cost Competitiveness Performers

Asia-Pacific:
- Over 40 million passengers per year: Soekarno-Hatta International,
- 10-40 million passengers per year: Haikou
- Under 10 million passengers per year: Chiang Rai
- Oceania Airports: Townsville, Gold Coast, Auckland

Europe:
- Over 25 million passengers per year: Copenhagen
- 10-25 million passengers per year: Athens
- Under 10 million passengers per year: Belgrade Nikola Tesla
- Airport Groups: ANA

N. America:
- Over 40 million passengers per year: Charlotte, Atlanta
- 25-40 million passengers per year: Minneapolis, Orlando International
- 10-25 million passengers per year: Salt Lake City, Tampa
- Under 10 million passengers per year: Omaha
The ATRS Global Airport Performance Benchmarking Report: 3 volumes, over 600 pages of valuable data and analysis.

ATRS Airport Database (2002-2014)

Details at

www.atrsworld.org

Report and Database sale finances benchmarking research project
Thank You!
Merci beaucoup!