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
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>15</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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 Oceania</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>206</strong></td>
<td><strong>24</strong></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

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% OF Non-Aeronautical Revenue, 2015

Highest Five and Lowest Five

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
Methodology

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
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-4b4 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

Figure S-4c4 Residual Variable Factor Productivity (2015), North America: under 10 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

Figure 5.4a1 Cost Competitiveness 2015 - Asia
HKG=0.0
Over 40 million Passengers per Year

Figure 5.4a2 Cost Competitiveness 2015 - Asia
HKG=0.0
10-40 million Passengers per Year

Figure 5.4a3 Cost Competitiveness 2015 - Asia
HKG=0.0
Under 10 million Passengers per Year
Key Results

Figure 5.4a4 Cost Competitiveness 2015 - Oceania
SYD=0.0

Figure 5.4a5 Cost Competitiveness 2015 - Asia Pacific
HKG=0.0
Airport Groups
Key Results
Key Results

Figure 5.4b3 Cost Competitiveness 2015 - Europe
CPH = 0.0
Under 10 million Passengers per Year

Figure 5.4 Cost Competitiveness 2015 - Europe
CPH = 0.0
Airport Groups
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

Figure 5.4c3 Cost Competitiveness 2015- North America
YVR=0.0
10-25 million Passengers per Year

Figure 5.4c4 Cost Competitiveness 2015- North America
YVR=0.0
Under 10 million Passengers per Year
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!