Key Findings: 2013 ATRS Global Airport Performance Benchmarking Project

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2013 ATRS Global Airport Performance Benchmarking Project

Key Findings

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Middle East: Paul Hooper
OUTLINE

Objective of the ATRS Benchmarking Study

Airports Included and ATRS Database

Some Characteristics of Sample Airports

Methodology

Key Results on Efficiency and Costs

User Charge Comparisons
OBJECTIVE OF THE BENCHMARKING STUDY

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

- Our study does not treat service quality differentials across airports because of our research resource constraints
2013 ATRS Global Airport Performance Benchmarking Project

Airport Database
195 MAJOR AIRPORTS AROUND THE WORLD

- North America, 77
- Asia Pacific, 51
- Europe, 67
- Oceania Countries (16)
- United States (65)
- Canada (12)

- 12 new airports

Classification:
- Objective
- Data
- Airport Characteristics
- Methodology
- Efficiency & Cost
- User Charge
26 AIRPORT GROUPS

- Asia Pacific (9)
- Europe (17)

1 new
The ATRS Database contains historic information (since FY 2002) including financial data, traffic and capacity data for the major airports and airport groups in the following geographic regions:

- **Asia Pacific including Oceania; Europe; North America**
- **Limited data on S. America and Africa**

The data in each continent is segregated into:

- **Traffic statistics and composition**
- **Airport characteristics** (runways, terminals, ownership form, etc)
- **Aeronautical Activities and Revenue**
- **Non-Aeronautical Activities and Revenue**
- **Labor input and other Operating Expenses**
- **Financial info obtained from Balance Sheets**

Visit [http://www.atrsworld.org/Database.html](http://www.atrsworld.org/Database.html) for more details and to purchase.
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Airport Characteristics
PASSENGERS TRAFFIC, FY2011
(IN ’000 PASSENGERS)
PASSENGER TRAFFIC (’000)-
TOP 10 AIRPORTS:

Objective | Data | Airport Characteristics | Methodology | Efficiency & Cost | User Charge
AIRCRAFT MOVEMENTS, FY 2010
(’000 ATM)

Objective  Data  Airport Characteristics  Methodology  Efficiency & Cost  User Charge
AIR CARGO TRAFFIC, FY 2010
(’000 METRIC TONS)
% NON-AERO REVENUE, FY 2011

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Asia Pacific
Europe
North America
2013 ATRS Global Airport Performance Benchmarking Project

Methodology
AIRPORT PRODUCTIVITY INDEX

**Outputs**
- Aircraft movement
- Passenger
- {Cargo tonnes}
- Non-aeronautical revenue output

**Inputs**
- Labour
- Other non-capital (soft-cost) input
- [Runways, terminal size, # of gates]
METHODOLOGY: EFFICIENCY MEASUREMENT

- **Variable Factor Productivity (VFP) Index**
  - Impossible - Total Factor Productivity (TFP) because of capital input cost accounting problem (comparable across different countries)

- **Unit Operating Cost Competitiveness Index:**
  Combines VFP and Input Price Index
MULTILATERAL AGGREGATION METHOD

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

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

\[
\ln \frac{X_i}{X_j} = \sum \frac{W_{ki} + \bar{W}_k}{2} \ln \frac{X_{ki}}{\tilde{X}_k} - \sum \frac{W_{kj} + \bar{W}_k}{2} \ln \frac{X_{kj}}{\tilde{X}_k}
\]
GROSS VARIABLE FACTOR PRODUCTIVITY (VFP)
NORTH AMERICA LARGE AIRPORTS
(YVR=1.0), FY 2011
POTENTIAL REASONS FOR THE MEASURED PRODUCTIVITY (GROSS VFP) DIFFERENTIALS

Factors Beyond Managerial Control:

- Airport size (Scale of aggregate output)
- Average aircraft size using the airport
- Share of international traffic
- Share of air cargo traffic
- Extent of capacity shortage - congestion delay
- Connecting/transfer ratio

We compute residual (Net) Variable Factor Productivity (RVFP) after removing effects of these Factors
GROSS VARIABLE FACTOR PRODUCTIVITY VS RESIDUAL VFP: NORTH AMERICA (YVR=1.0), FY 2011
ALTERNATIVE APPROACHES

- We explored Alternative approaches:
  - Data Envelopment Analysis (DEA)
  - Econometric Cost Function Approach including Stochastic Frontier methods (SFA)

- The rankings for top and bottom ranked airports are consistent despite using VFP, DEA or SFA.

Note: Industry acceptance of our report using more advanced/sophisticated methods is one of our major concern
RESIDUAL RANKING COMPARISON OF TOP 15 AIRPORTS IN US
RESIDUAL RANKING COMPARISON OF BOTTOM 15 AIRPORTS IN US
RESIDUAL RANKING COMPARISON OF MID-RANKED 15 AIRPORTS IN US

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2013 ATRS Airport Benchmarking
Key Results on Efficiency & Cost
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): ASIA (HKG=1.0), FY 2011

Gimpo, Incheon, Guam

Airports

Airport Groups

Residual VFP
Mean

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RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): OCEANIA (SYD=1.0), FY 2011

Sydney, Auckland, Townsville

Airports

Airport Groups

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Residual VFP | Mean

0.8
0.6
0.4
0.2
0
1
1.2

SYD

0.8
0.6
0.4
0.2
0
1
1.2

Objective Data Airport Characteristics Methodology Efficiency & Cost User Charge
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): EUROPE LARGE AIRPORTS (CPH=1.0), FY 2011

Copenhagen Kastrup, Athens, Zurich
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): EUROPE SMALL & MEDIUM AIRPORTS (CPH=1.0), FY 2011

Geneva, Basel, Nice
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): NORTH AMERICA LARGE AIRPORTS (YVR=1.0), FY 2011

Atlanta, Minneapolis St. Paul, Charlotte

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RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): N. AMERICA SMALL & MEDIUM AIRPORTS (YVR=1.0), FY 2011

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TOP EFFICIENCY PERFORMERS (2013)
(based on Net VFP index=operating/management efficiency)

Asia Pacific:
- **Asian Airports:**
  - Gimpo, Incheon, Guam
- **Oceania Airports:**
  - Sydney, Auckland, Townsville

Europe:
- **Large Airports (> 15 million pax):**
  - Copenhagen Kastrup, Athens, Zurich
- **Small/Medium Airports (< 15 millions Pax):**
  - Geneva, Basel, Nice
TOP EFFICIENCY PERFORMERS (2013)
(based on Net VFP index=operating/management efficiency)

North America:

• *Large Airports (> 15 million pax)*:
  • {Atlanta (Globally Most Efficient Airport)}
  • *Minneapolis St Paul*, Charlotte, Tampa

• *Small/Medium Airports (< 15 millions Pax)*:
  • *Oklahoma City*, Richmond, Raleigh-Durham

Global (10th Global Excellence Award)

• *Hartsfield-Jackson Atlanta International Airport*
PAST AIRPORT EFFICIENCY EXCELLENCE
TOP PERFORMERS, 2008 - 2012

North America
Hartsfield-Jackson
 Atlanta International
 Airport

Europe
Copenhagen Kastrup
 International Airport

Asia-Pacific
Hong Kong International
 Airport

Large Airport Category:
Hartsfield-Jackson
 Atlanta International
 Airport

Large Airport Category:
Copenhagen Kastrup
 International Airport

Large Airport Category:
Hong Kong International
 Airport

Large Airport Category:
Oslo International
 Airport

Large Airport Category:
Geneva Cointrin
 International Airport

Small/Medium Airport

Category: Copenhagen Kastrup
 International Airport

Category: Hong Kong International
 Airport

Category: Oslo International
 Airport

Category: Genevè Aéroport

Asian Airport Excellence
Award: Hong Kong International
 Airport

Oceania Excellence
Award: Sydney Airport

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COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

ASIA (HKG=0.0) – THE HIGHER THE BETTER

Haikou, Seoul Gimpo, Airport Authority of India
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

OCEANIA (SYD=0.0)

Queensland Airport Limited (QAL), Auckland, Dunedin (NZ)
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT
EUROPE - LARGE AIRPORTS (CPH=0.0)

Athens, Lisbon, ANA (Aeroportos de Portugal)
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT
EUROPE - SMALL & MEDIUM AIRPORTS (CPH=0.0)

Ljubljana (Slovenia), Basel, Tallinn (Estonia)
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT
N. AMERICA - LARGE AIRPORTS (YVR=0.0)

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COST COMPETITIVENESS: = NET VFP AND INPUT PRICE EFFECT
N. AMERICA - SMALL & MEDIUM AIRPORTS (YVR=0.0)

Oklahoma City, Richmond (Virginia), Raleigh-Durham
2013 ATRS Airport Benchmarking

User Charge Comparison
LANDING CHARGES
FOR BOEING 767-400, 2012 (IN US$)

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ASIA PACIFIC: COMBINED LANDING AND PASSENGER CHARGES FOR BOEING 767, 2012 (IN US$)

Lowest charges: **Taipei Taoyuan, Dunedin (New Zealand)**

Highest charges: **Osaka Kansai, Tokyo Narita**
EUROPE: COMBINED LANDING AND PASSENGER CHARGES FOR BOEING 767, 2012 (IN US$)

<table>
<thead>
<tr>
<th>Airport</th>
<th>Combined Landing and Passenger Charges for Boeing 767</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riga</td>
<td>18,000</td>
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</tr>
<tr>
<td>Luxembourg</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>London Heathrow</td>
<td>14,000</td>
<td></td>
</tr>
<tr>
<td>Ben Gurion (Tel Aviv)</td>
<td>16,000</td>
<td></td>
</tr>
</tbody>
</table>

Lowest charges: Riga (Latvia), Luxembourg

Highest charges: London Heathrow, Ben Gurion (Tel Aviv)
NORTH AMERICA: COST PER ENPLANED PASSENGER, 2011 (IN US$)

Canada:
- Lowest CPE: Victoria, Regina
- Highest CPE: Toronto, Montreal

United States:
- Lowest CPE: Charlotte, California Bob Hope (Burbank, CA)
- Highest CPE: New York JFK, Newark Liberty

<table>
<thead>
<tr>
<th>Airport</th>
<th>CPE</th>
<th>US Mean</th>
<th>Canada Mean</th>
</tr>
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</table>

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ATRS AIRPORT BENCHMARKING REPORT

- The ATRS Global Airport Performance Benchmarking Report: 3 volumes, over 600 pages of valuable data and analysis.

- Can be purchased by visiting www.atrsworld.org

- Report sale finances our annual benchmarking research project

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- Korea Airports Corporation
- Kazan international airport, Russia
- German Aerospace Center
- Airbus
- Boeing
- Boeing
Thank You

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