2014 ATRS Global Airport Performance Benchmarking Project

Key Findings

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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
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Airport Database
200 MAJOR AIRPORTS AROUND THE WORLD

- N. America, 78
- Europe, 69
- Asia Pacific, 53
- Oceania Countries (16)
- United States (66)
- Canada (12)

1 new airport
2 new airports

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Objective | Data | Airport Characteristics | Methodology | Efficiency & Cost | User Charge
26 AIRPORT GROUPS

Europe (17)

Asia Pacific (9)
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
PASSENGER TRAFFIC (’000)-
TOP 10 AIRPORTS:

<table>
<thead>
<tr>
<th>Airport</th>
<th>FY 2008</th>
<th>FY 2010</th>
<th>FY 2012</th>
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<tbody>
<tr>
<td>Asia Pacific</td>
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<td>Europe</td>
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<td>North America</td>
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</table>
AIRCRAFT MOVEMENTS, FY 2012 ('000 ATM)
PASSENGERS PER AIRCRAFT MOVEMENTS, FY 2012
% NON-AERO REVENUE, FY 2012

Asia Pacific

Europe

North America

Objective  Data  Airport Characteristics  Methodology  Efficiency & Cost  User Charge
2014 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]

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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)

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

\[
\ln \frac{X_i}{X_j} = \sum \frac{W_{ki} + \bar{W}_k}{2} \ln \frac{X_{ki}}{\bar{X}_k} - \sum \frac{W_{kj} + \bar{W}_k}{2} \ln \frac{X_{kj}}{\bar{X}_k}
\]
GROSS VARIABLE FACTOR PRODUCTIVITY (VFP)

ASIAN AIRPORTS
(HKG=1.0), FY 2012
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: ASIA (HKG=1.0), FY 2012
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Key Results on Efficiency & Cost
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): ASIA (HKG=1.0), FY 2012
GROSS VARIABLE FACTOR PRODUCTIVITY VS RESIDUAL VFP: Europe Large Airports (CPH=1.0), FY 2012
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP):
EUROPE LARGE AIRPORTS (CPH=1.0), FY 2012

Copenhagen Kastrup, Zurich, Oslo
GROSS VARIABLE FACTOR PRODUCTIVITY VS RESIDUAL VFP: Europe Small & Medium Airport (CPH=1.0), FY 2012
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP):
EUROPE SMALL & MEDIUM AIRPORTS (CPH=1.0), FY 2012

Athens, Geneva, Basel

Objective  Data  Airport Characteristics  Methodology  Efficiency & Cost  User Charge
GROSS VARIABLE FACTOR PRODUCTIVITY VS RESIDUAL VFP: N. American Large Airports (YVR=1.0), FY 2012
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): NORTH AMERICA LARGE AIRPORTS (YVR=1.0), FY 2012

Atlanta, Charlotte, Minneapolis St. Paul
GROSS VARIABLE FACTOR PRODUCTIVITY VS RESIDUAL VFP: N. American Small & Medium Airport (YVR=1.0), FY 2012
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): N. AMERICA SMALL & MEDIUM AIRPORTS (YVR=1.0), FY 2012

Oklahoma City, Calgary, Raleigh-Durham
GROSS VARIABLE FACTOR PRODUCTIVITY VS RESIDUAL VFP: Oceanian Airports (SYD=1.0), FY 2012
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): OCEANIA (SYD=1.0), FY 2012

Sydney, Dunedin, Melbourne

Objective Data Airport Characteristics Methodology Efficiency & Cost User Charge
TOP EFFICIENCY PERFORMERS (2014)
(based on Net VFP index=operating/management efficiency)

Asia Pacific:
- **Asian Airports:**
  - Busan Gimhae, Jeju, Hong Kong
- **Oceania Airports:**
  - Sydney, Dunedin, Melbourne

Europe:
- **Large Airports (> 15 million pax):**
  - Copenhagen Kastrup, Zurich, Oslo
- **Small/Medium Airports (< 15 millions Pax):**
  - Athens, Geneva, Basel
TOP EFFICIENCY PERFORMERS (2014)
(based on Net VFP index=operating/management efficiency)

North America:

• Large Airports (> 15 million pax):
  • Atlanta, Charlotte, Minneapolis St Paul

• Small/Medium Airports (< 15 millions Pax):
  • Oklahoma City, Calgary, Raleigh-Durham
PAST AIRPORT EFFICIENCY EXCELLENCE TOP PERFORMERS, 2009 - 2013

**North America**
- 2009: Hartsfield-Jackson Atlanta International Airport
- 2010: Hartsfield-Jackson Atlanta International Airport
- 2011: Hartsfield-Jackson Atlanta International Airport
- 2012: Hartsfield-Jackson Atlanta International Airport
- 2013: Hartsfield-Jackson Atlanta International Airport

**Europe**
- 2009: Copenhagen Kastrup International Airport
- 2010: Large Airport Category: Oslo International Airport  
Small/Medium Airport Category: Geneva Cointrin International Airport
- 2011: Large Airport Category: Oslo International Airport  
Copenhagen Kastrup International Airport  
Small/Medium Airport Category: Genève Aéroport
- 2012: Large Airport Category: Copenhagen Kastrup International Airport  
Small/Medium Airport Category: Genève Aéroport
- 2013: Large Airport Category: Copenhagen Kastrup International Airport  
Small/Medium Airport Category: Genève Aéroport

**Asia-Pacific**
- 2009: Hong Kong International Airport
- 2010: Large Airport Category: Hong Kong International Airport  
Small/Medium Airport Category: Seoul Gimpo International Airport
- 2011: Asian Airport Excellence Award: Hong Kong International Airport
- 2012: Asian Airport Excellence Award: Seoul Gimpo International Airport
- 2013: Asian Airport Excellence Award: Seoul Gimpo International Airport

**Objective**  
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**Airport Characteristics**  
**Methodology**  
**Efficiency & Cost**  
**User Charge**
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

ASIA (HKG=0.0) – THE HIGHER THE BETTER

Haikou, Busan Gimhae, Jakarta
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT
EUROPE - LARGE AIRPORTS (CPH=0.0)

Copenhagen, Lisbon, Istanbul Ataturk
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT
EUROPE - SMALL & MEDIUM AIRPORTS (CPH=0.0)

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

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

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Oklahoma City, Raleigh-Durham, Richmond (Virginia)
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT
OCEANIA (SYD=0.0)

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User Charge Comparison
LANDING CHARGES
FOR AIRBUS 320, 2013 (IN US$)
ASIA PACIFIC: COMBINED LANDING AND PASSENGER CHARGES FOR AIRBUS 320, 2013 (IN US$)

Lowest charges: Taipei Taoyuan, New Delhi
Highest charges: Osaka Kansai, Nagoya
EUROPE: COMBINED LANDING AND PASSENGER CHARGES FOR AIRBUS 320, 2013 (IN US$)

Lowest charges: **Luxembourg**, Riga (Latvia)

Highest charges: **London Heathrow**, London Gatwick - Peak
NORTH AMERICA: COST PER ENPLANED PASSENGER, 2012 (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, Washington Dulles
LANDING CHARGES
FOR BOEING 737-800, 2013 (IN US$)

Objective
Data
Airport Characteristics
Methodology
Efficiency & Cost
User Charge
ASIA PACIFIC: COMBINED LANDING AND PASSENGER CHARGES FOR BOEING 737-800, 2013 (IN US$)

Lowest charges: **Taipei Taoyuan, New Delhi**
Highest charges: **Osaka Kansai, Nagoya**
EUROPE: COMBINED LANDING AND PASSENGER CHARGES FOR BOEING 737-800, 2013 (IN US$)

Lowest charges: Luxembourg, Riga (Latvia)
Highest charges: London Heathrow, London Gatwick - Peak
NORTH AMERICA: COST PER ENPLANED PASSENGER, 2012 (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, Washington Dulles

Canadian Mean
US Mean

Objective > Data > Airport Characteristics > Methodology > Efficiency & Cost > User Charge
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
Thank You

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- FY 2002-FY2012 (11 years data)
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- Download Database Manual and order form from the above website.