Key Findings of 2011 ATRS Global Airport Performance Benchmarking project

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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
  - Comparison of Airport Charge Levels

- Our study does not treat service quality differentials across airports for data reasons
# Airports Included in the study

<table>
<thead>
<tr>
<th>Region</th>
<th>Airports</th>
<th>Airport Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada-US</td>
<td>63</td>
<td>14</td>
</tr>
<tr>
<td>Europe</td>
<td>45</td>
<td>14</td>
</tr>
<tr>
<td>Asia</td>
<td>32</td>
<td>5</td>
</tr>
<tr>
<td>Oceania</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Latin America</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

**Total**: 156 airports  
**Total**: 19 airport groups
The ATRS Database

- The ATRS Database contains time-series information (from year 2001) 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 and
  - Latin America (non-financial data only)

- The data includes
  - Characteristics of Airport (capacity, type of ownership etc)
  - Traffic (ATM, passengers, freight, etc.)
  - Aeronautical Revenue
  - Non-Aeronautical Revenue including concession, car parking
  - Operating Statistics and Operating Expenses
  - Balance Sheet

- 1.5 year lag in data (due to airport annual reporting lag)
Data Sources: FY 2001-2009

- Airport’s Financial Statements, Annual Reports and direct data requests;
- US FAA, DOT statistics;
- Association of European Airlines (AEA) Statistics
- ICAO Digest of Statistics:
  - annual and monthly traffic data
  - annual financial data - not for all airports
- ACI; IATA
  - annual traffic statistics; capacity information; airport charges
  - general information surveys (Asia Pacific and Europe) occasional and not complete
- IMF and World Bank – various price indices including GDP deflators for service sectors and PPP
- US Census Bureau, Statistics Canada – regionally based Cost of Living Index
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Passenger Traffic - Top 10 Airports
(’000 passengers): 2009, 2007, 2005

Asia Pacific
Europe
North America
Aircraft Movements, 2009 (’000 ATM)

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Air Cargo - Top 10 Airports (’000 metric tons)

2009, 2007, 2005

Metric Tonnes (’000)

Asia Pacific
Europe
North America
% Non-Aero Revenue, 2009

North America
Europe
Asia Pacific

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Methodology

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Methodology: Efficiency Measurement

- **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).

- In fact, we compute VFP using the multilateral index procedure proposed by Caves, Christensen and Diewert (1982).
## Airport Productivity Index

<table>
<thead>
<tr>
<th>Outputs</th>
<th>Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Aircraft movement</td>
<td>• Labour</td>
</tr>
<tr>
<td>• Passengers</td>
<td>• Other non-labor, non-capital (soft cost) inputs – i.e., catch all expenses deflated by price index</td>
</tr>
<tr>
<td>• Non-aeronautical revenues</td>
<td></td>
</tr>
<tr>
<td>• (Cargo tonnes handled)</td>
<td></td>
</tr>
</tbody>
</table>

- **Outputs**
  - Aircraft movement
  - Passengers
  - Non-aeronautical revenues
  - (Cargo tonnes handled)

- **Inputs**
  - Labour
  - Other non-labor, non-capital (soft cost) inputs – i.e., catch all expenses deflated by price index
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) measures after removing effects of these Factors
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After removing factors beyond managerial control such as capacity constraint, average aircraft size, % international traffic, etc, **CHC’s relative performance in term of Net VFP improved significantly.**
Residual (Net) Variable Factor Productivity: Asia (HKG=1.0)
Residual (Net) Variable Factor Productivity: Europe (CPH=1.0)
Residual (Net) Variable Factor Productivity:
N. America – Passengers > 15 million (YVR=1.0)
Residual (Net) Variable Factor Productivity:
N. America – Passengers < 15 million (YVR=1.0)
Top Efficiency Performers (2011)
(based on Net VFP index=operating/management efficiency)

Asia Pacific:
- Oceania Airports: Sydney, Christchurch
- Asian Airports: Hong Kong, Singapore

Europe:
- Large Airports (> 15 million pax): Copenhagen and Oslo
- Small/Medium Airports (< 15 millions Pax): Geneva, Reykjavik-Keflavik

North America (Canada/US):
- Large Airports (> 15 million pax): Atlanta, Minneapolis/St Paul
- Small/Medium Airports (< 15 millions Pax): Raleigh-Durham, Reno
## Past Airport Efficiency Excellence Top Performers, 2006-2010

<table>
<thead>
<tr>
<th>Region</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>Hartsfield-Jackson Atlanta International Airport</td>
<td>Hartsfield-Jackson Atlanta International Airport</td>
<td>Hartsfield-Jackson Atlanta International Airport</td>
<td>Hartsfield-Jackson Atlanta International Airport</td>
<td>Large Airport Category Hartsfield-Jackson Atlanta International Airport</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Small/Medium Airport Category Raleigh-Durham International Airport</td>
</tr>
<tr>
<td>Europe</td>
<td>Copenhagen Kastrup International Airport</td>
<td>Oslo International Airport</td>
<td>Copenhagen Kastrup International Airport</td>
<td>Copenhagen Kastrup International Airport</td>
<td>Large Airport Category Oslo International Airport</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Small/Medium Airport Category Genève Aéroport</td>
</tr>
<tr>
<td>Asia-Pacific</td>
<td>Incheon International Airport</td>
<td>Hong Kong International Airport</td>
<td>Hong Kong International Airport</td>
<td>Hong Kong International Airport</td>
<td>Large Airport Category Hong Kong International Airport</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Small/Medium Airport Category Seoul Gimpo International Airport</td>
</tr>
</tbody>
</table>
Cost Competitiveness = Net VFP and Input Price Effect
N. America – Passengers < 15 million (YVR=0.0)
Cost Competitiveness = Net VFP and Input Prices Effect
Europe (CPH=0.0) - the higher the better
Cost Competitiveness: = Net VFP and Input Price Effect
Asia (HKG=0.0) – the higher the better
Cost Competitiveness = Net VFP and Input Price Effect

Oceania (SYD=0.0)  - the higher the better

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Cost Competitiveness = Net VFP and Input Price Effect
N. America – Passengers > 15 million (YVR=0.0)
Top Unit Cost Competitiveness Performers

- **Asia-Pacific:**
  - Oceania: Christchurch, Sydney
  - Asia: Haikou, AOT (Airport Authority of Thailand), APII (Angkasa Pura II, Indonesian Group)

- **Europe:**
  - Polish Airports, Reykjavik-Keflavik, Tallinn

- **N. America:**
  - Large Airports (> 15 million Pax): Atlanta, Charlotte, Tampa
  - Small/Med Airports (< 15 million Pax): Raleigh-Durham, Reno, Nashville
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Landing Charges: Basis for computing

• **Assumptions:**
  – (Use of signatory airlines)
  – Passenger aircraft
  – Peak and off-peak charges separately treated
  – International flights
  – Some airports have summer/winter rates – **these are averaged**
  – Assumed 2 hours aircraft parking

• **Exclusion:** Tax, Noise charges, lighting surcharge
Landing Charges for Boeing 767-400, 2010 (in US$)
Asia Pacific: Landing Charge for Airbus 320, 2010 (in US$)
Summary – Landing/Takeoff Charges (Airbus 320)

- **Asia-Pacific Results:**
  - Highest charges: Haneda, Kansai, Narita
  - Lowest charges: Kuala Lumpur, Bangkok, Cairns

- **European Results:**
  - Highest charges: London Gatwick peak, Dusseldorf, Dublin
  - Lowest charges: Riga (Latvia), Stockholm, Malta

- **North American Results:**
  - Highest charges: Toronto, LaGuardia, St. Louis
  - Lowest charges: Charlotte, Nashville, Raleigh-Durham,
Combined Landing and Passenger Charges

Given that it is difficult to separate landing and passenger charges for some airports, the \textit{combined landing and passenger charge} may reflect a better picture.
Asia Pacific: Combined Landing and Passenger Charge for Airbus 320, 2010 (in US$)
Europe: Combined Landing and Passenger Charge
for Airbus 320, 2010 (in US$)
N. America: data allows us to compute Cost per Enplaned Pax for Airlines (CPE)

- CPE = sum of landing fees, terminal arrival fee, rents and utilities, terminal apron charges/tiedowns, and passengers other aeronautical payments to airports divided by enplaned passengers
North America: Total Charges per Enplaned Passenger, 2009 (in US$)
Summary – Cost per Enplaned Passenger (CPE)

North American Results:

- Highest charges: Toronto, New York JFK, Newark
- Lowest charges: Charlotte, Atlanta, Salt Lake City
Summary – Combined Landing and Pax Charges (N.Am Cost per Enplaned Pax)

- **Asia-Pacific Results:**
  - Highest charges: Kansai, Nagoya, Narita
  - Lowest charges: Kuala Lumpur Low Cost Carrier Terminal, Chennai (India), Mumbai (India)

- **European Results:**
  - Highest charges: London Heathrow, Prague (Czech Rep.), Paris Orly
  - Lowest charges: Brussels South Charleroi, Riga (Latvia), Manchester (Off-Peak)

- **North American Results:**
  - Highest charges: Toronto, New York JFK, Newark
  - Lowest charges: Charlotte, Atlanta, Salt Lake City
ATRS Airport Benchmarking Report

- The ATRS Global Airport Performance Benchmarking Report: 3 volumes, over 500 pages of valuable data and analysis
- Can be purchased by visiting www.atrsworld.org
- Report sale finances our annual benchmarking research project
Thank You

2012 ATRS World Conference
(Taiwan in late June, 2012)