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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

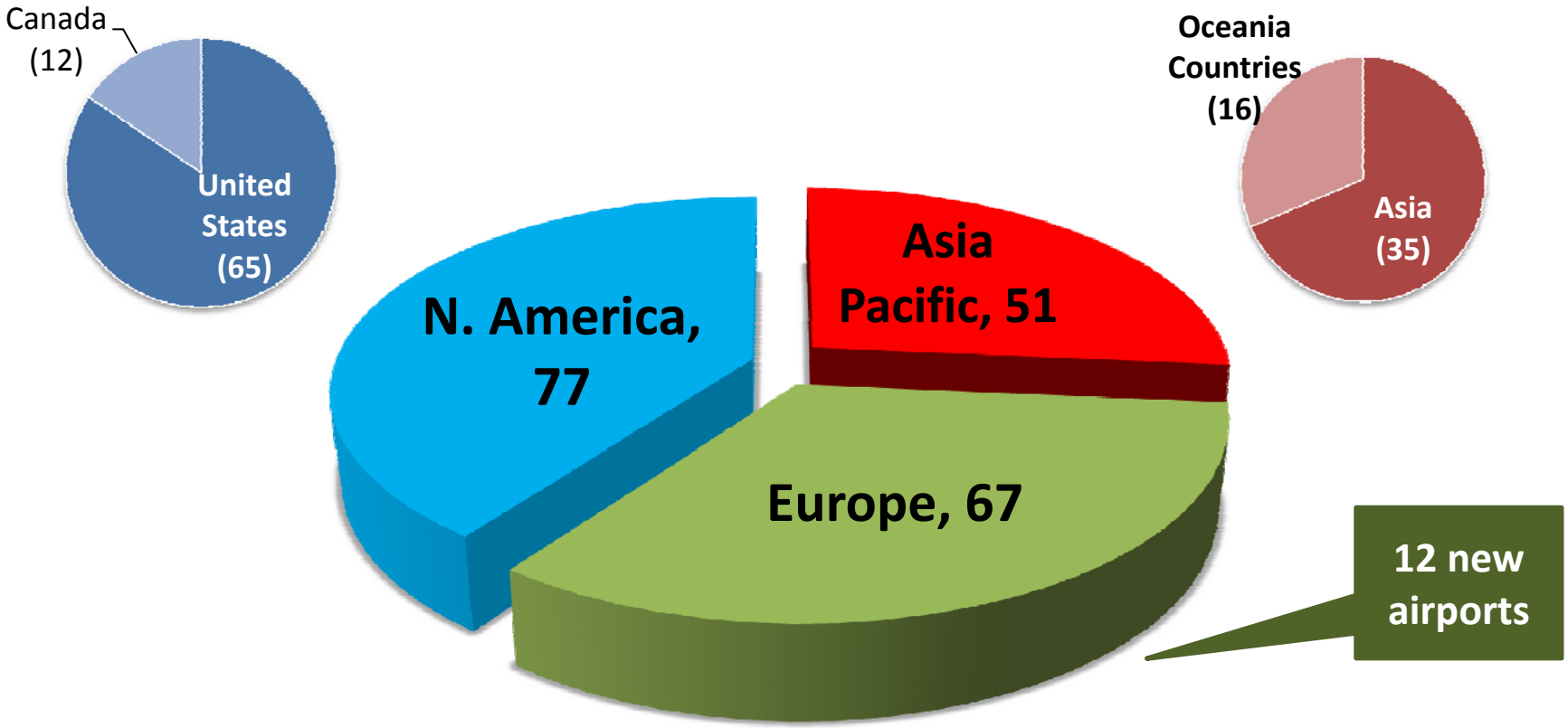
OBJECTIVE OF THE BENCHMARKING STUDY

- 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

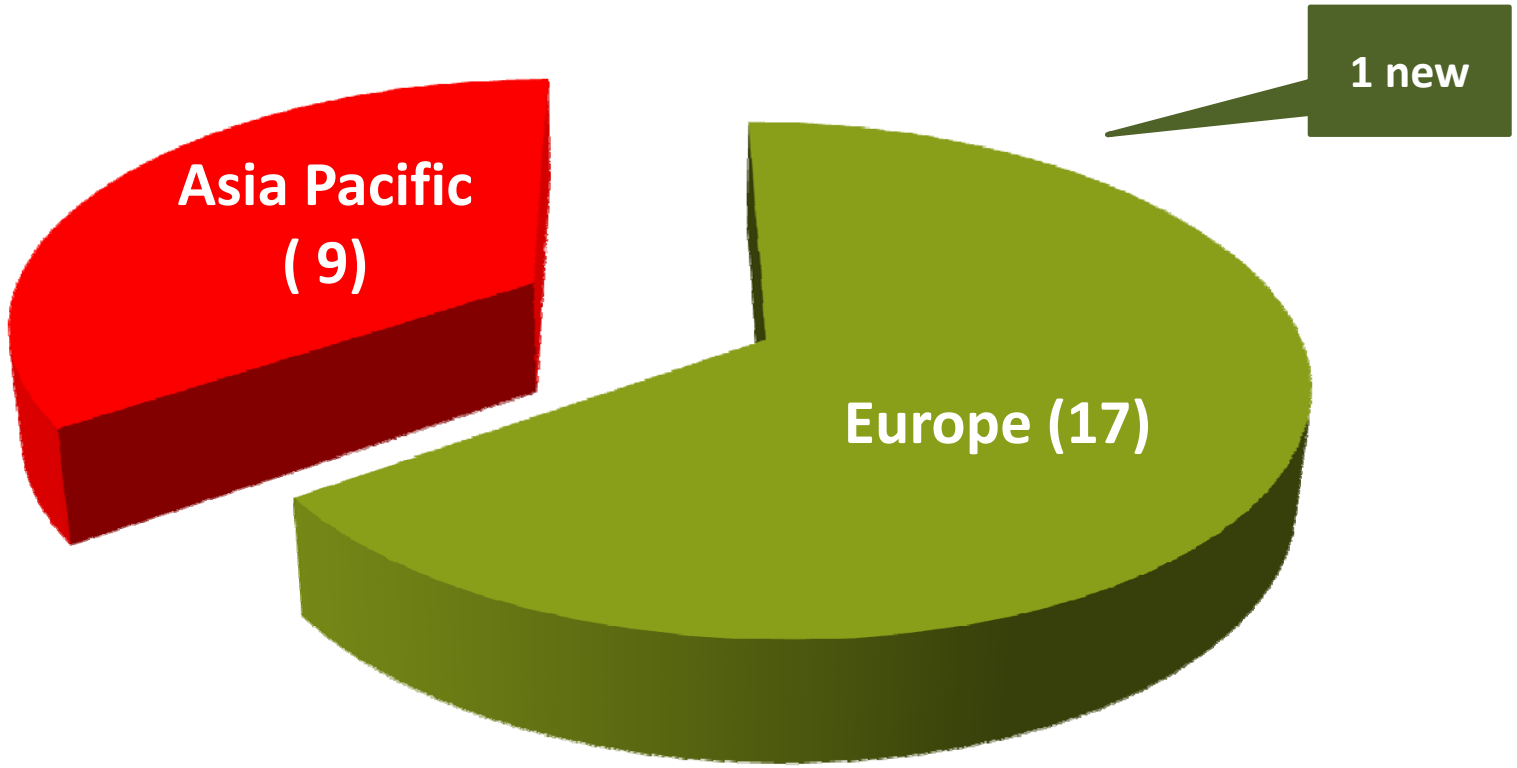
2013 ATRS Global Airport Performance Benchmarking Project

Airport Database

195 MAJOR AIRPORTS AROUND THE WORLD



26 AIRPORT GROUPS



ATRS AIRPORT DATABASE, FY 2002-2011

- 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 for more details and to purchase.

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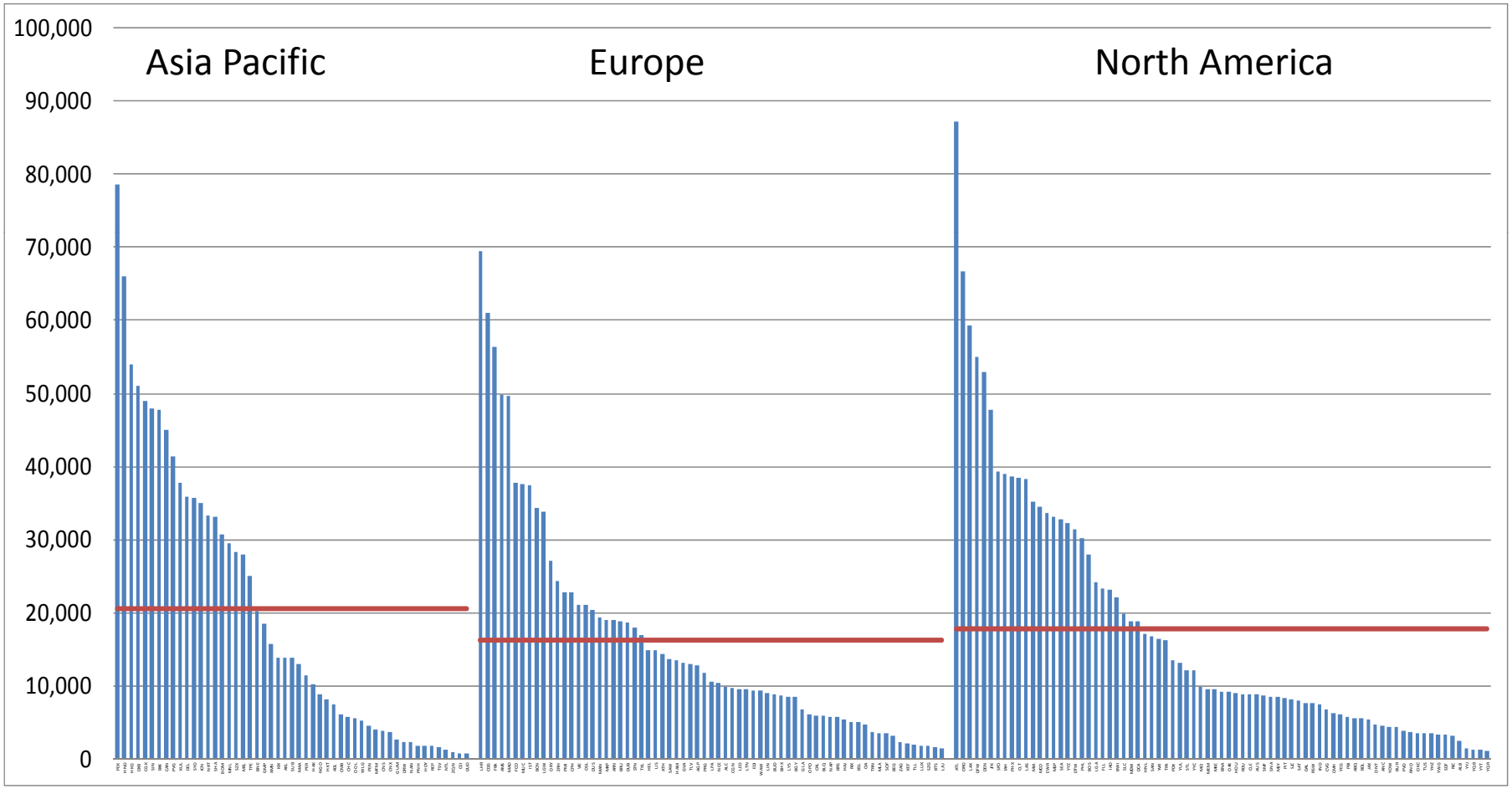
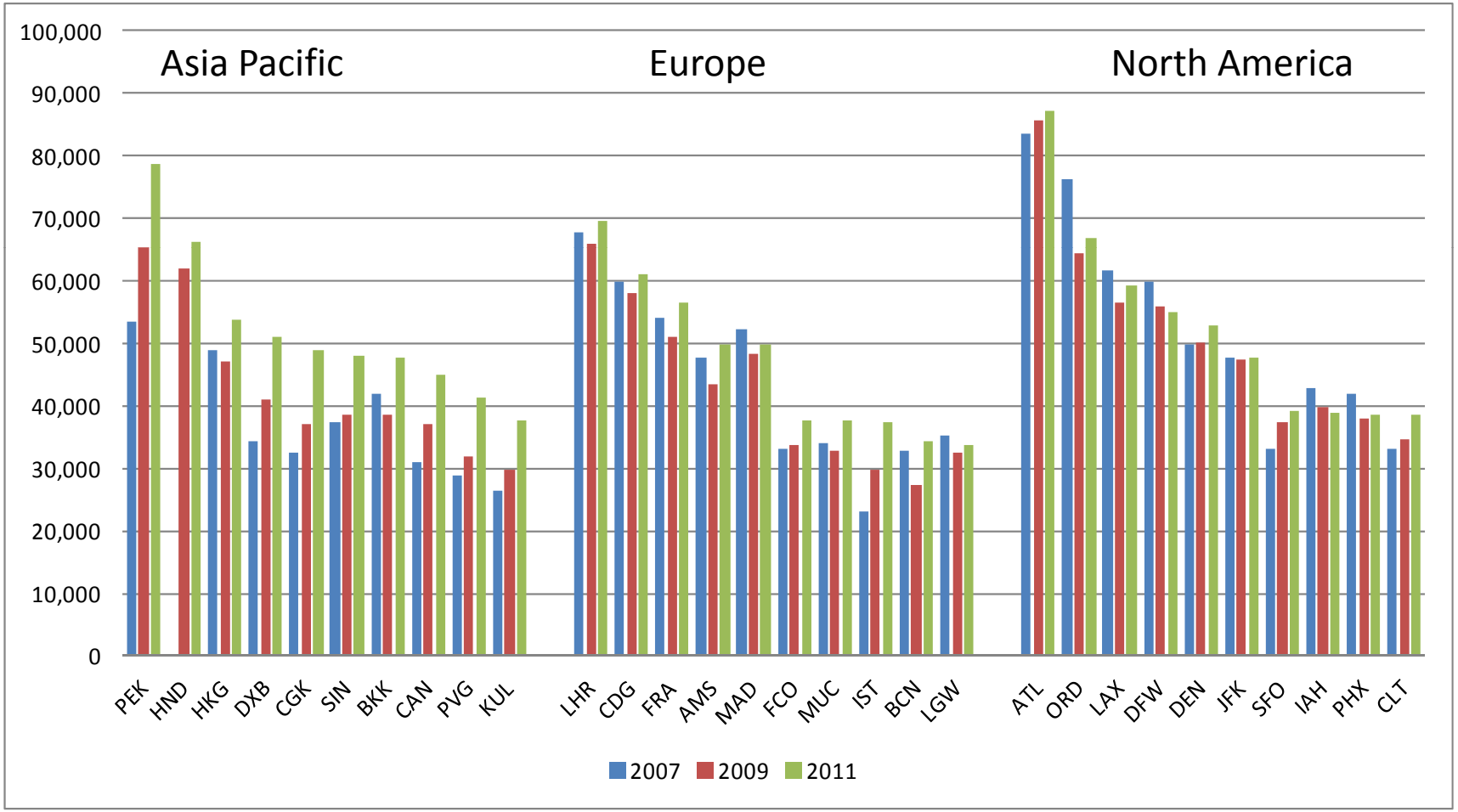
Airport Characteristics

PASSENGERS TRAFFIC, FY2011
(IN '000 PASSENGERS)

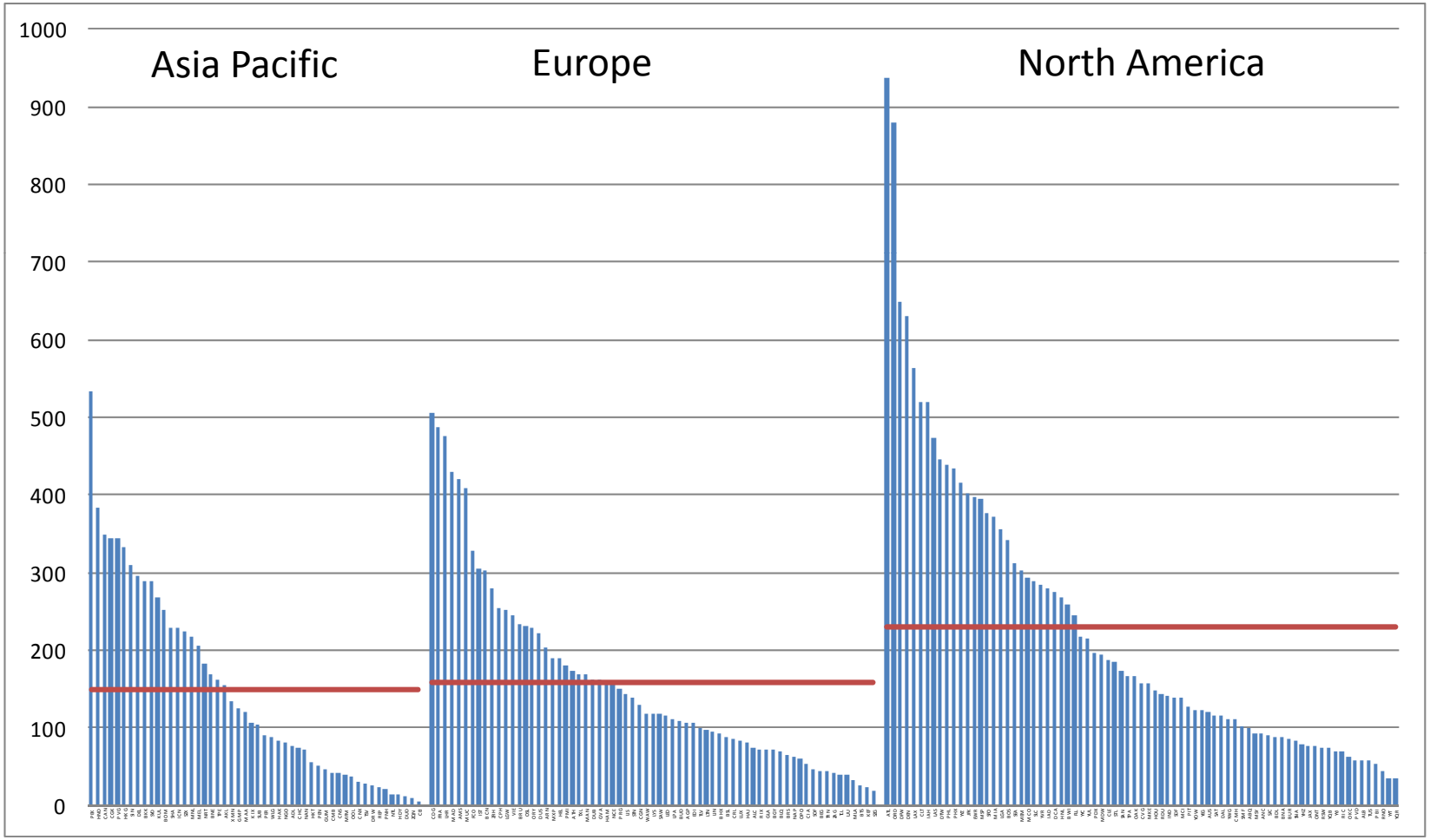


PASSENGER TRAFFIC ('000)- TOP 10 AIRPORTS:

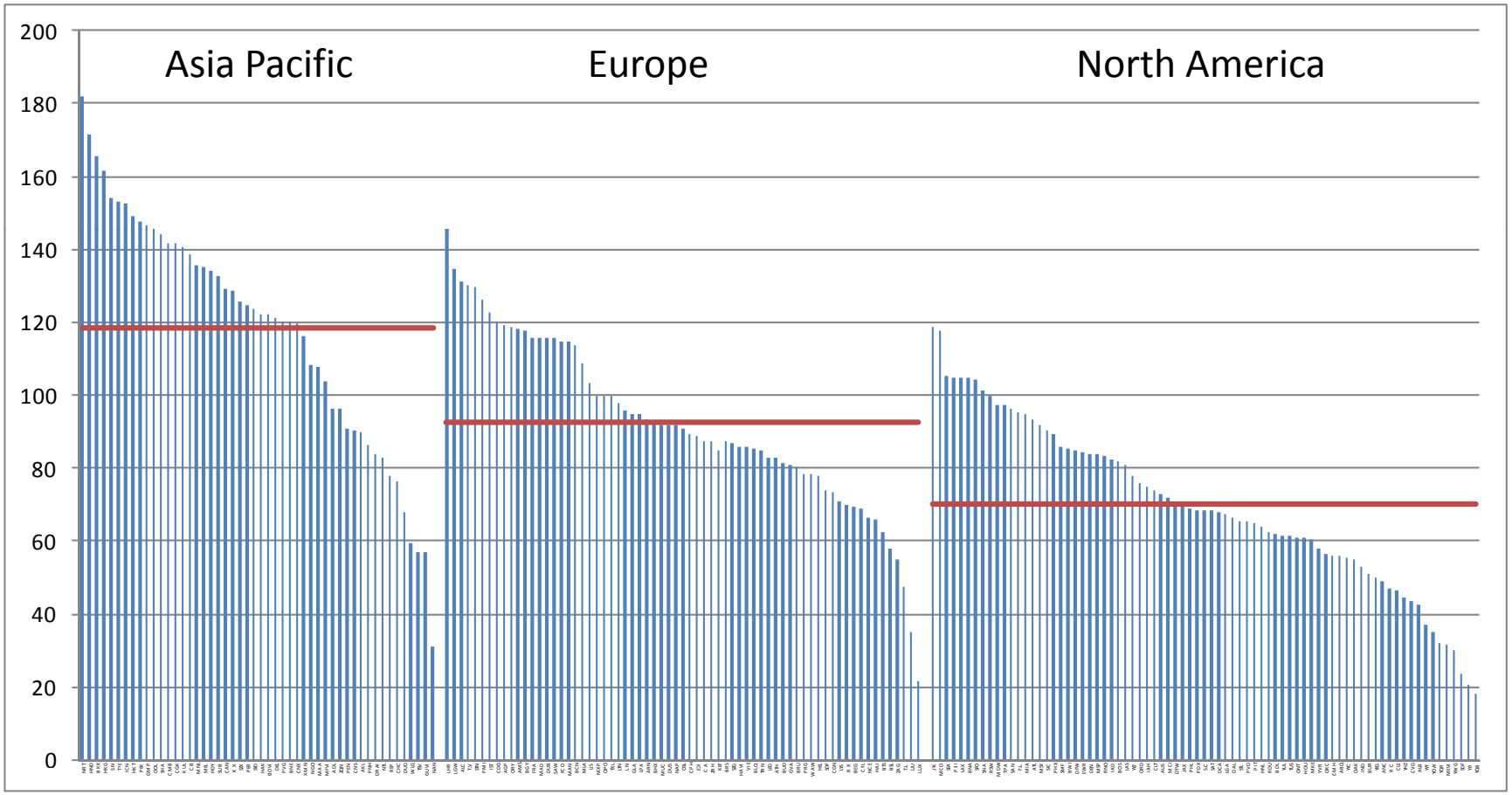
FY 2007, 2009, 2011



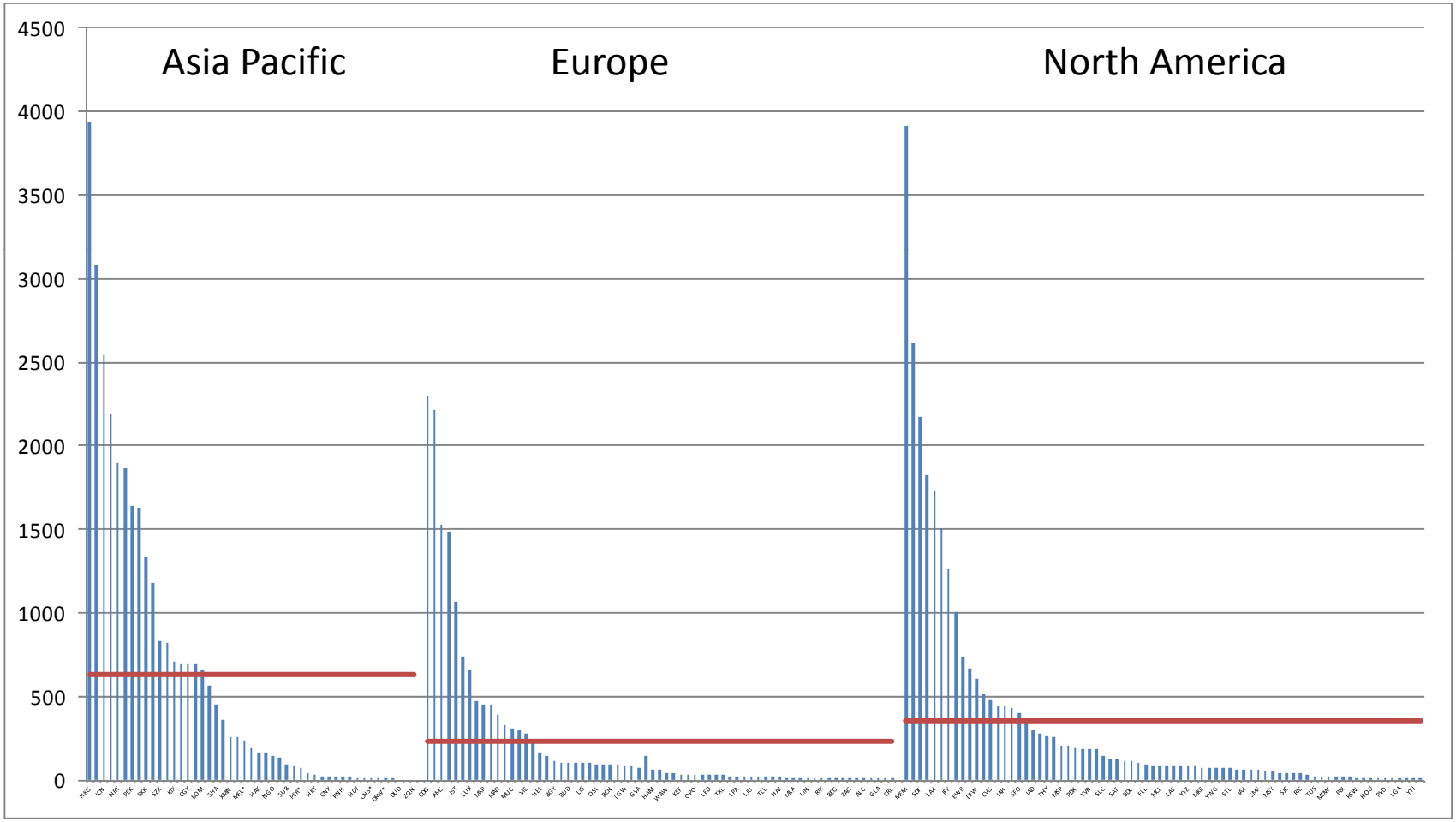
AIRCRAFT MOVEMENTS, FY 2010
('000 ATM)



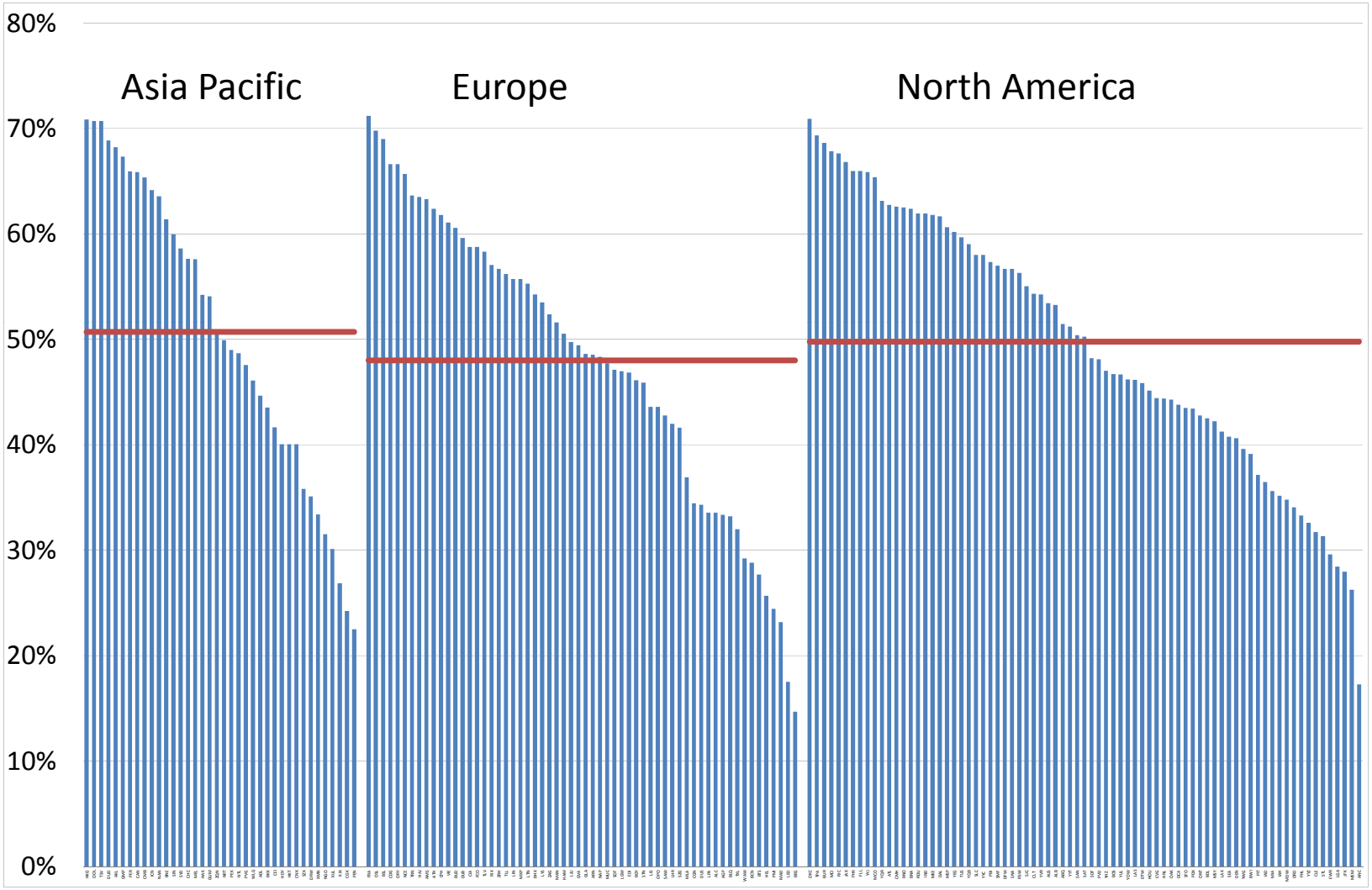
PASSENGERS PER AIRCRAFT MOVEMENTS, FY 2011



AIR CARGO TRAFFIC, FY 2010
('000 METRIC TONS)



% NON-AERO REVENUE, FY 2011



2013 ATRS Global Airport Performance Benchmarking Project

Methodology

ATRS
Air Transport Research Society

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**

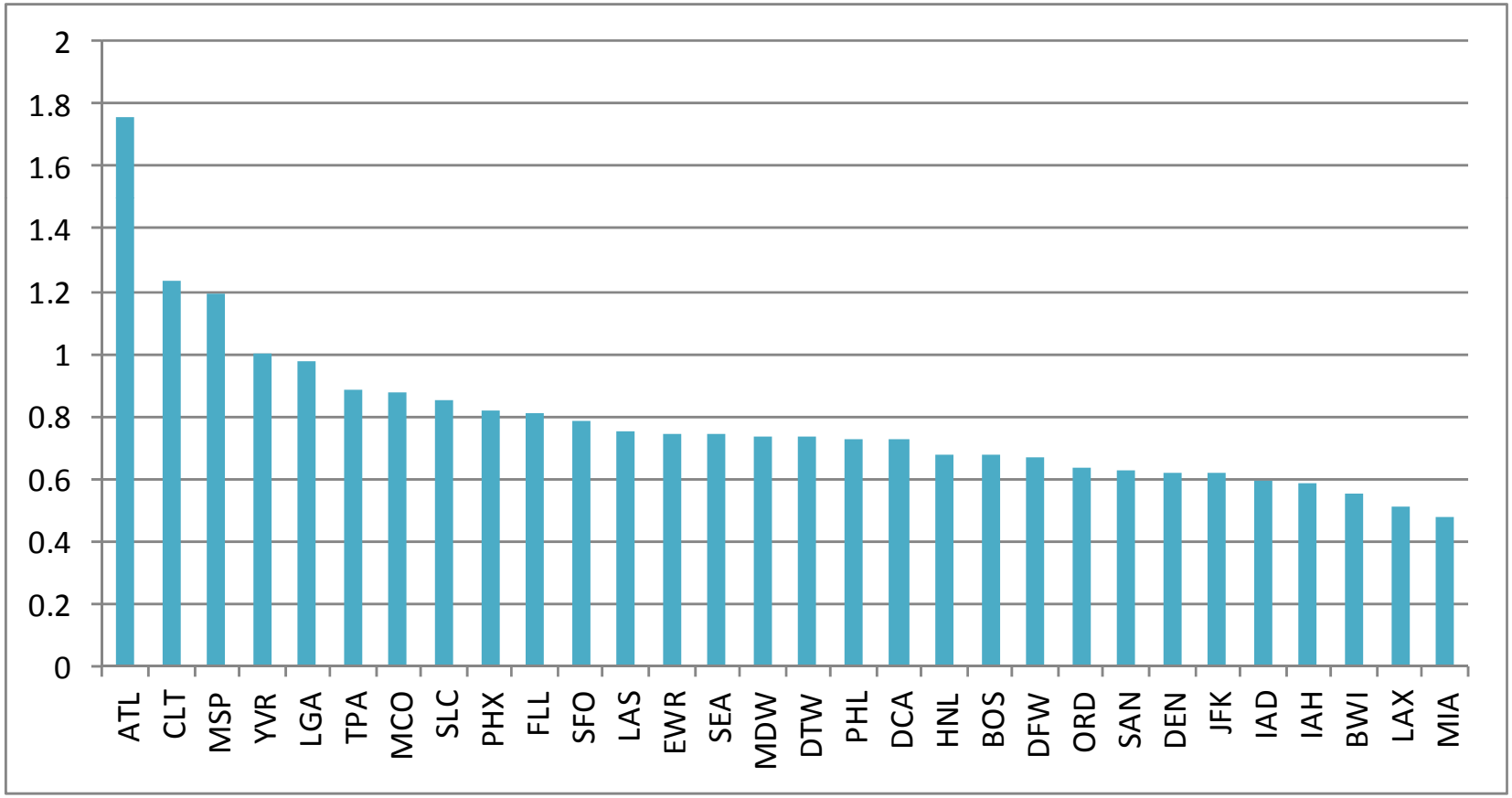
MULTILATERAL AGGREGATION METHOD

- 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



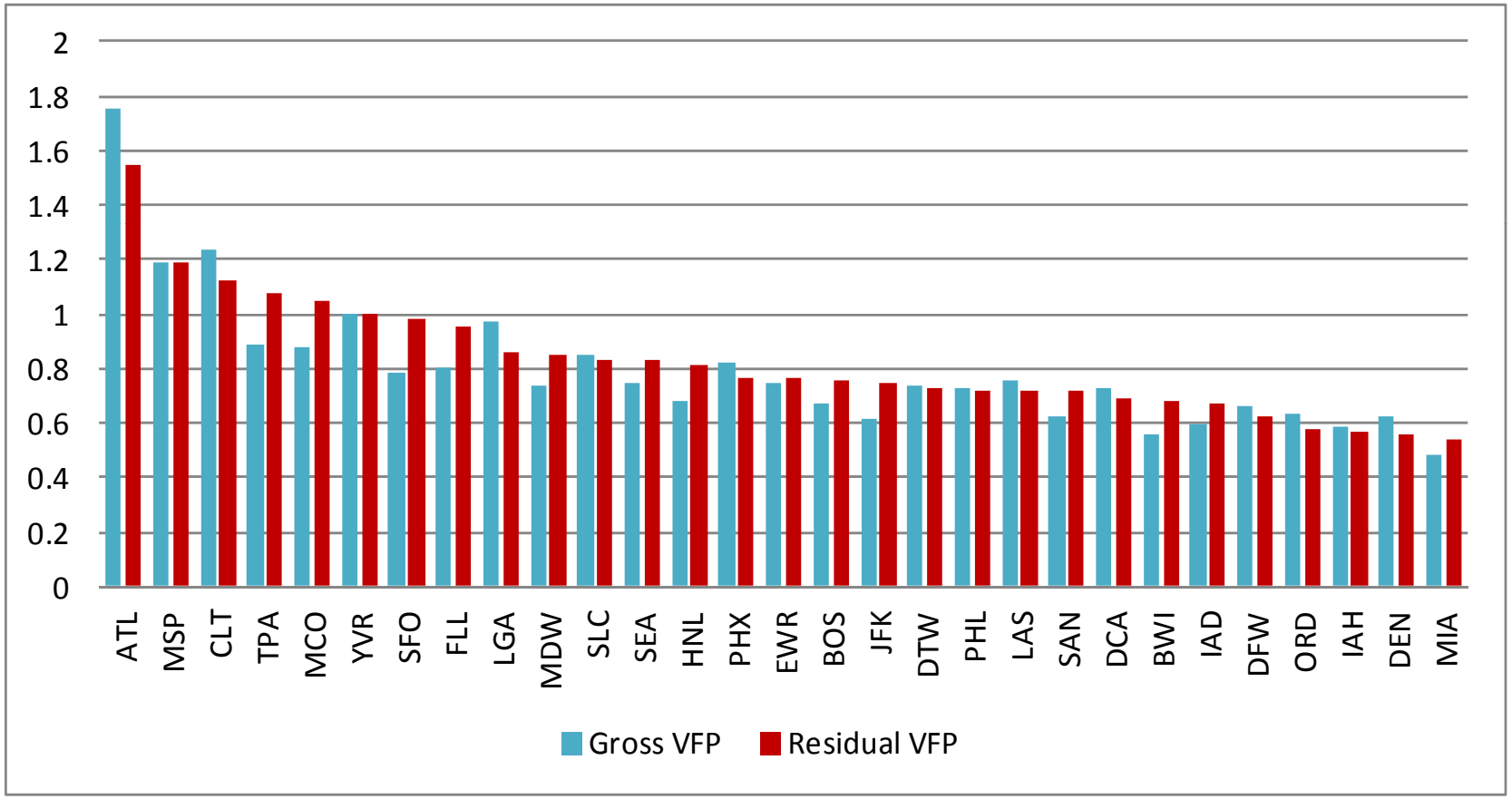
POTENTIAL REASONS FOR THE MEASURED PRODUCTIVITY (GROSS VFP) DIFFERENTIALS

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



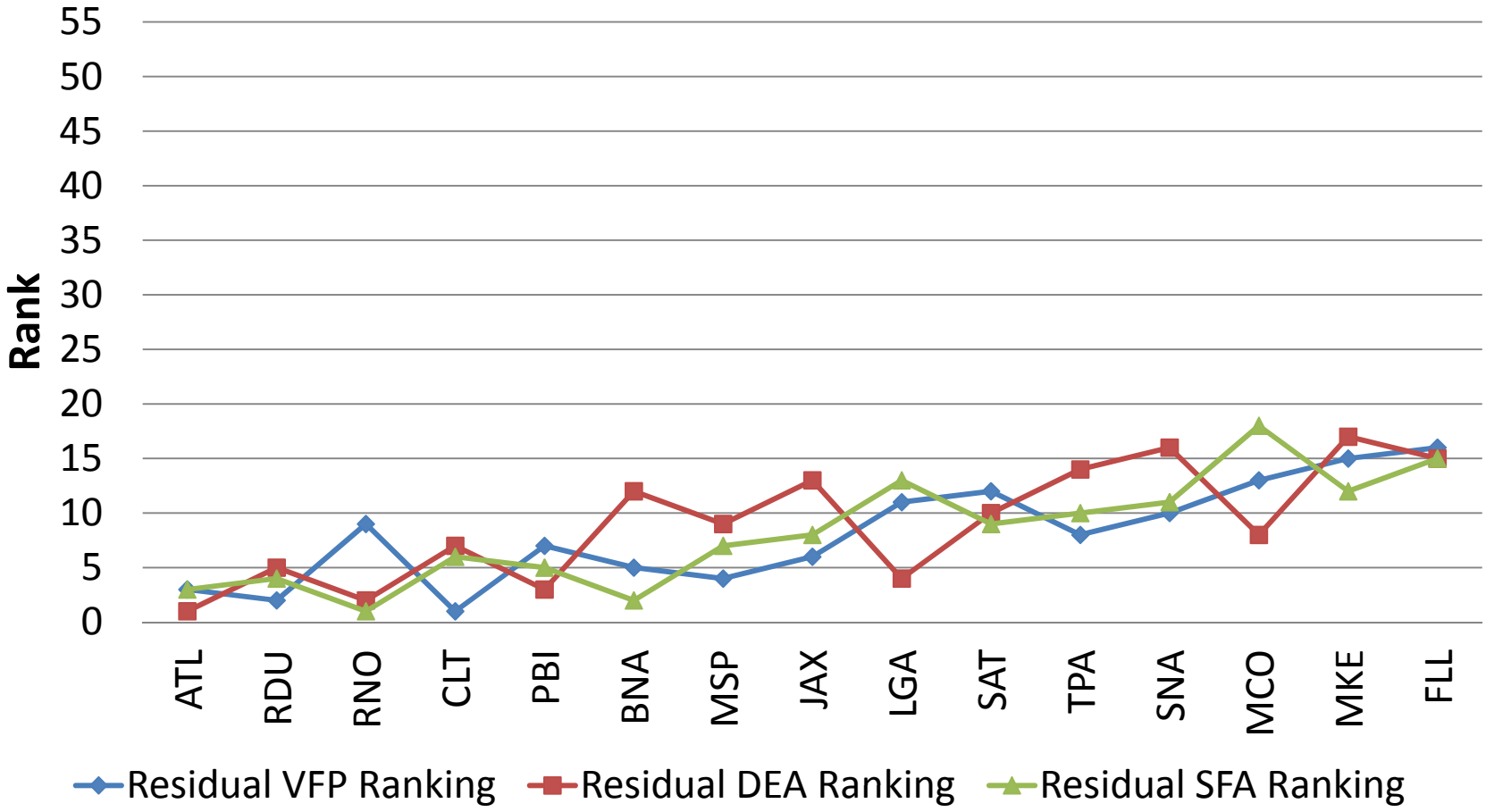
ALTERNATIVE APPROACHES

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

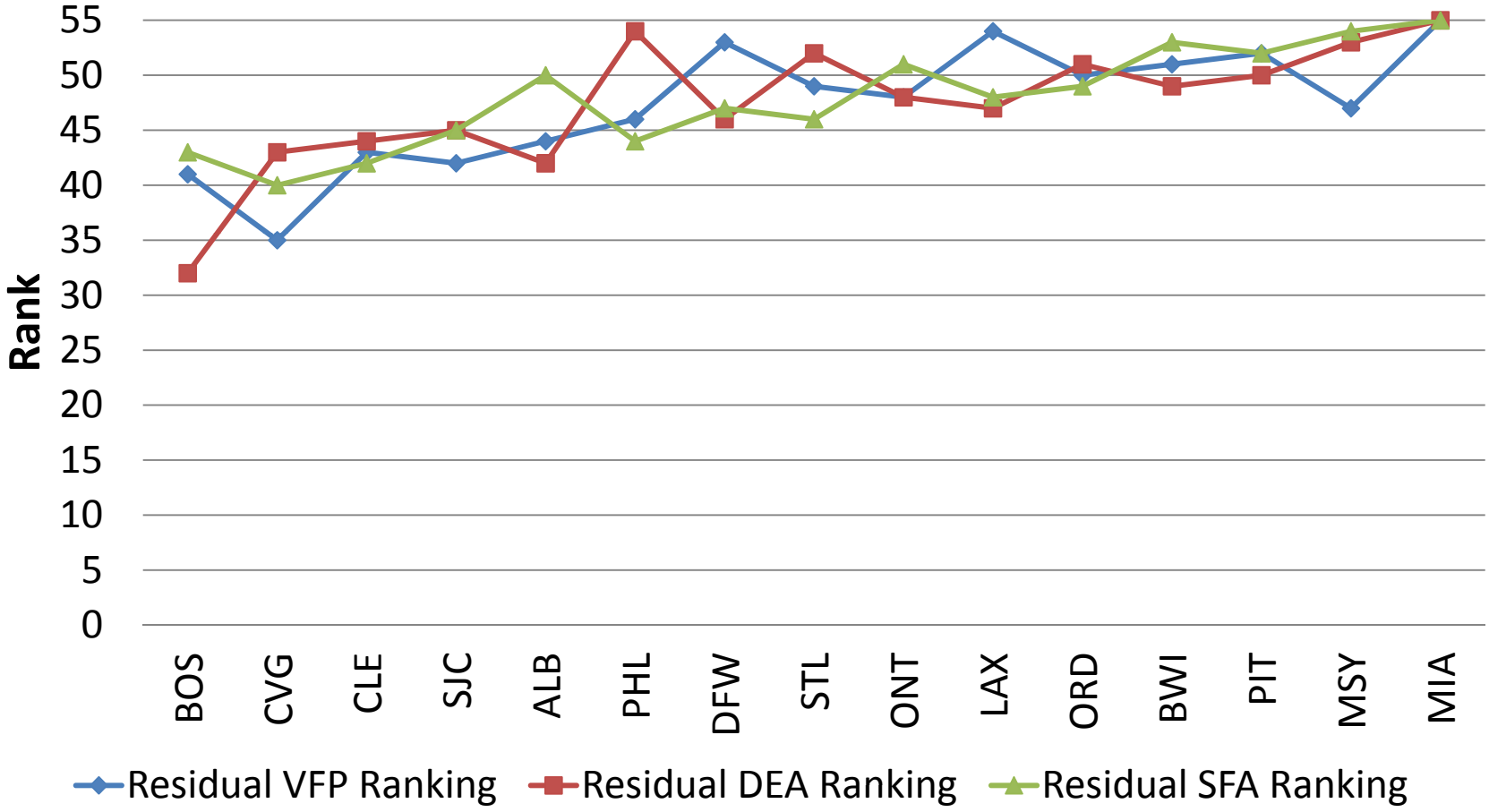
- The rankings for **top and bottom ranked airports** are **consistent** despite using VFP, DEA or SFA.

Note: Industry acceptance of our report using more advanced/sophisticated methods is one of our major concern

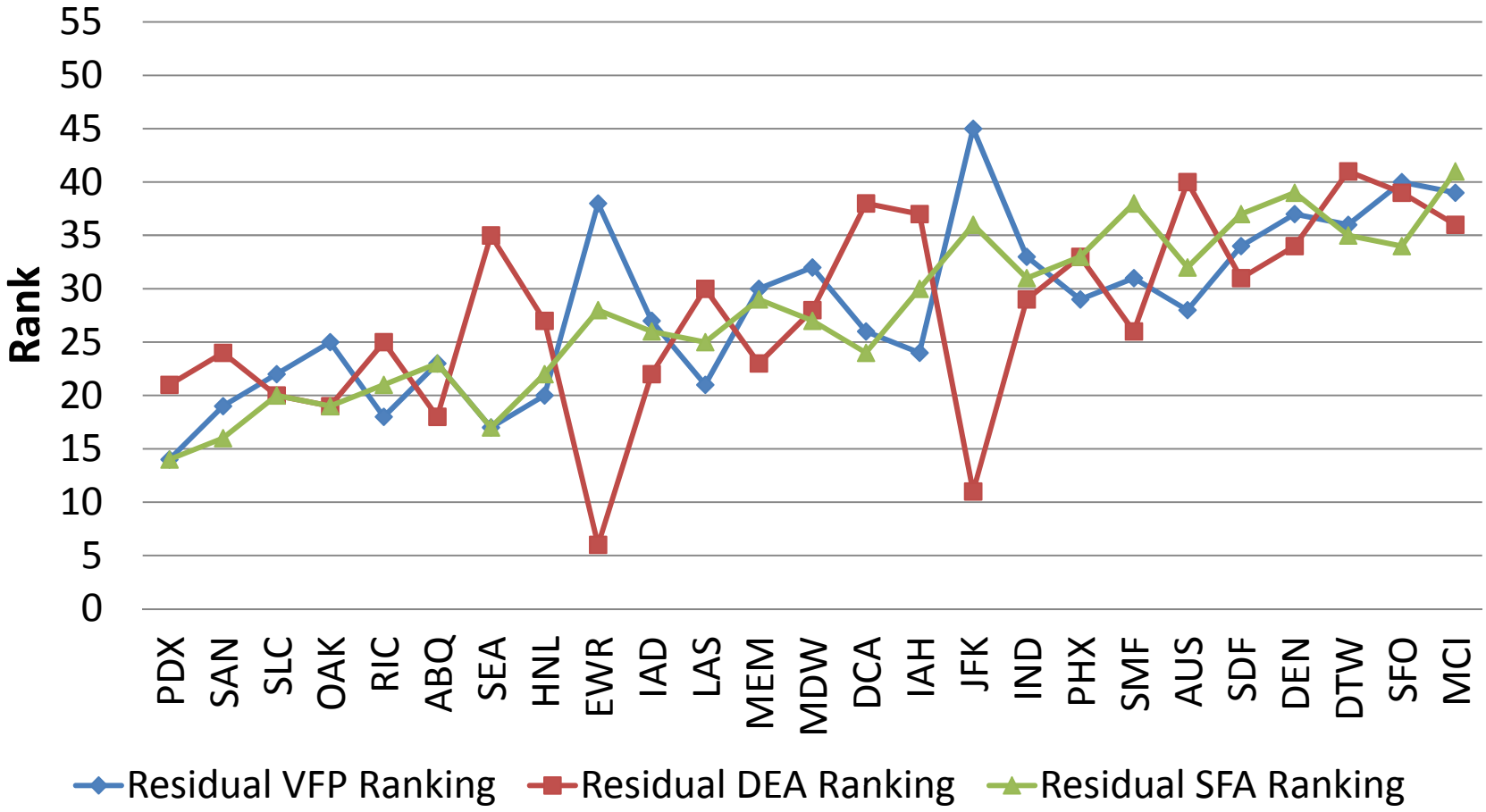
RESIDUAL RANKING COMPARISON OF TOP 15 AIRPORTS IN US



RESIDUAL RANKING COMPARISON OF BOTTOM 15 AIRPORTS IN US



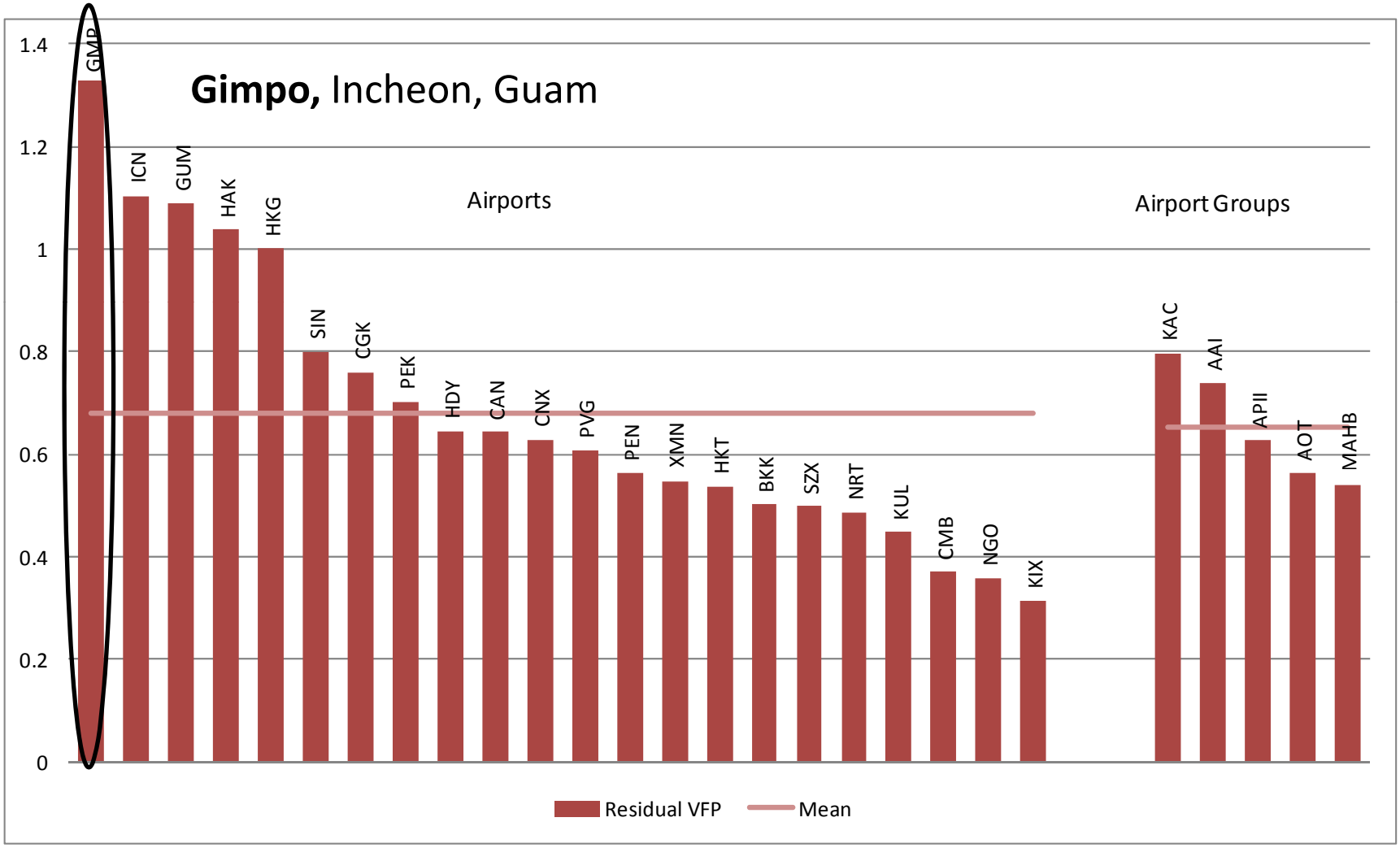
RESIDUAL RANKING COMPARISON OF MID-RANKED 15 AIRPORTS IN US



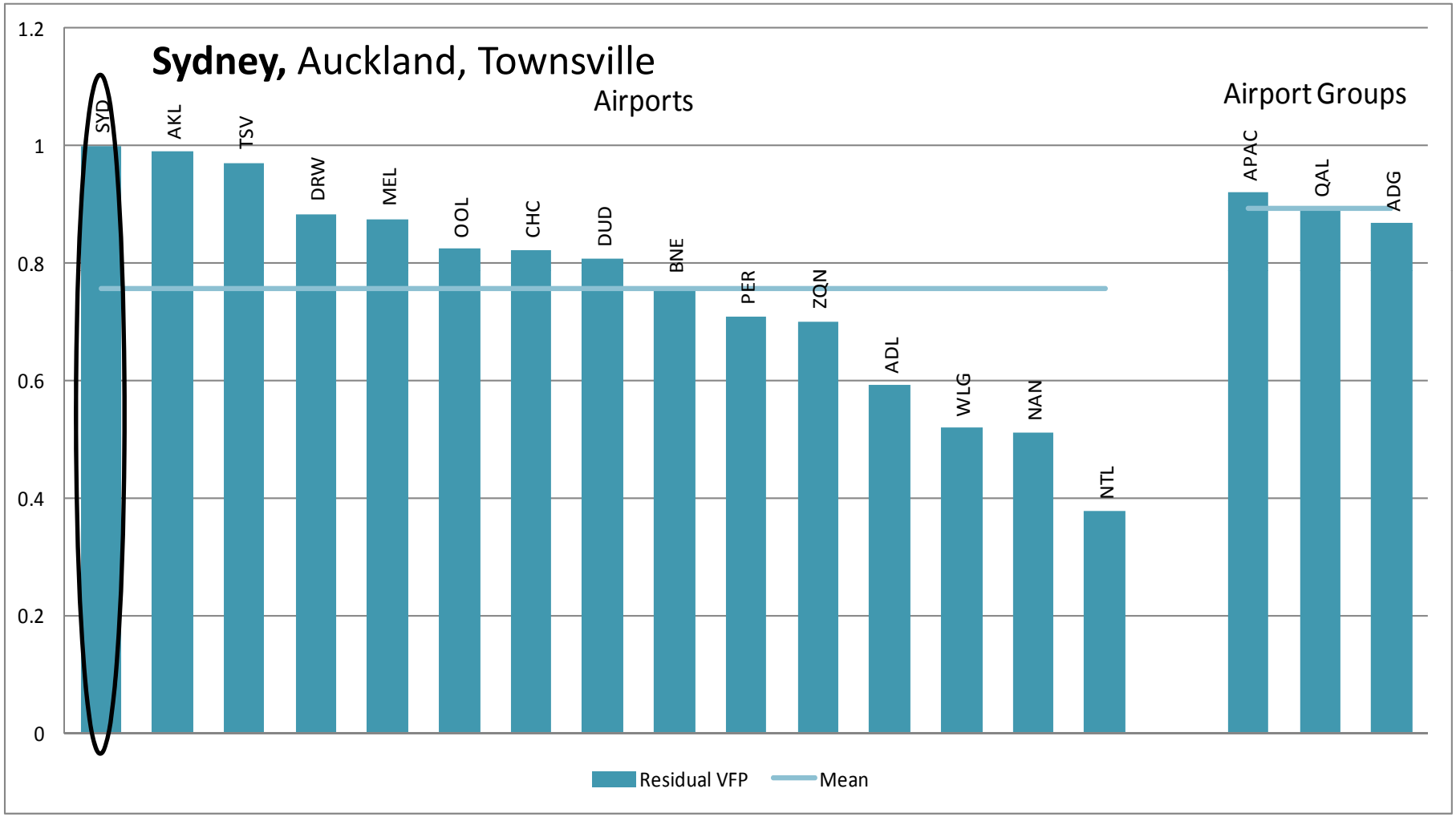
2013 ATRS Airport Benchmarking

Key Results on Efficiency & Cost

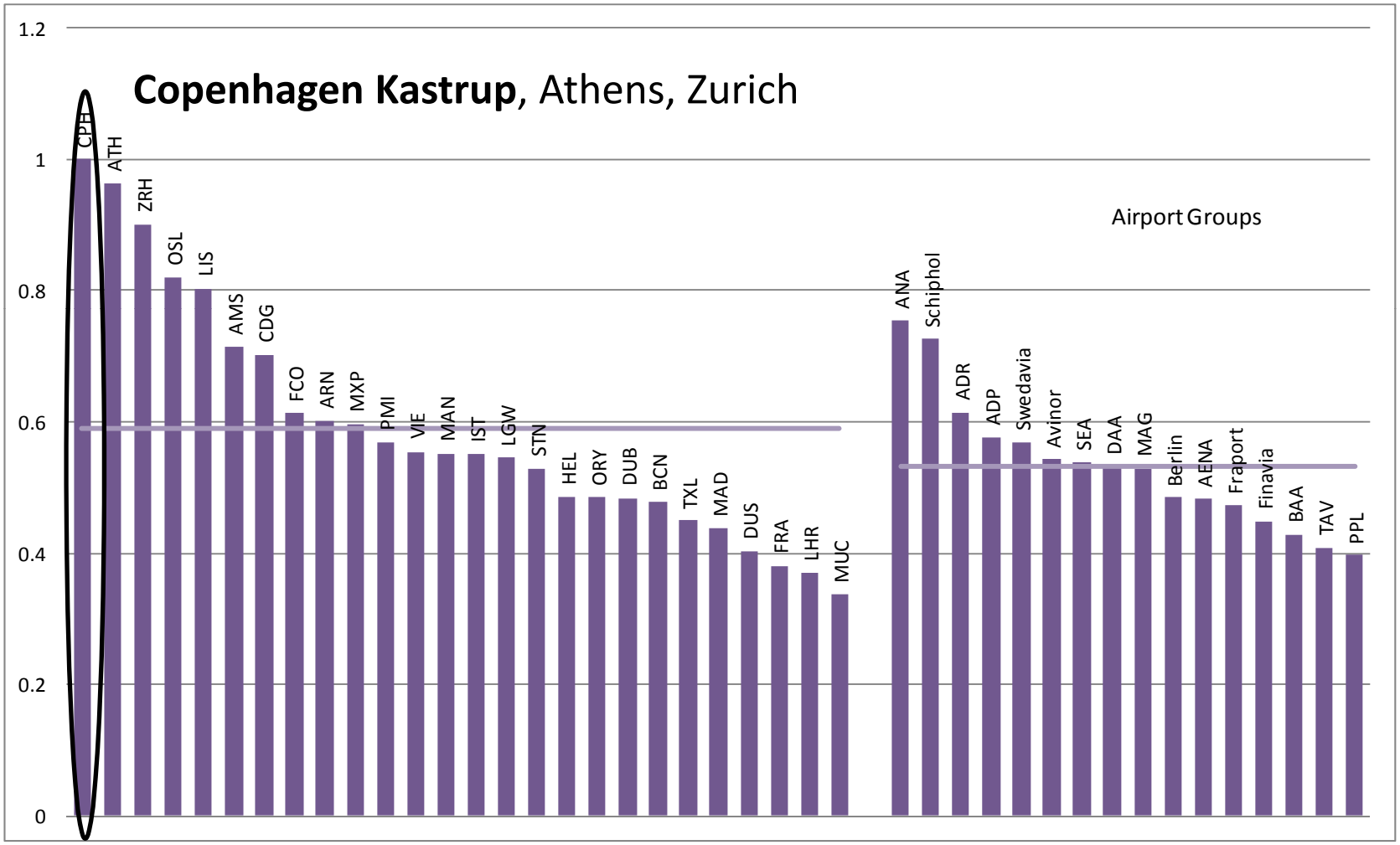
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): ASIA (HKG=1.0), FY 2011



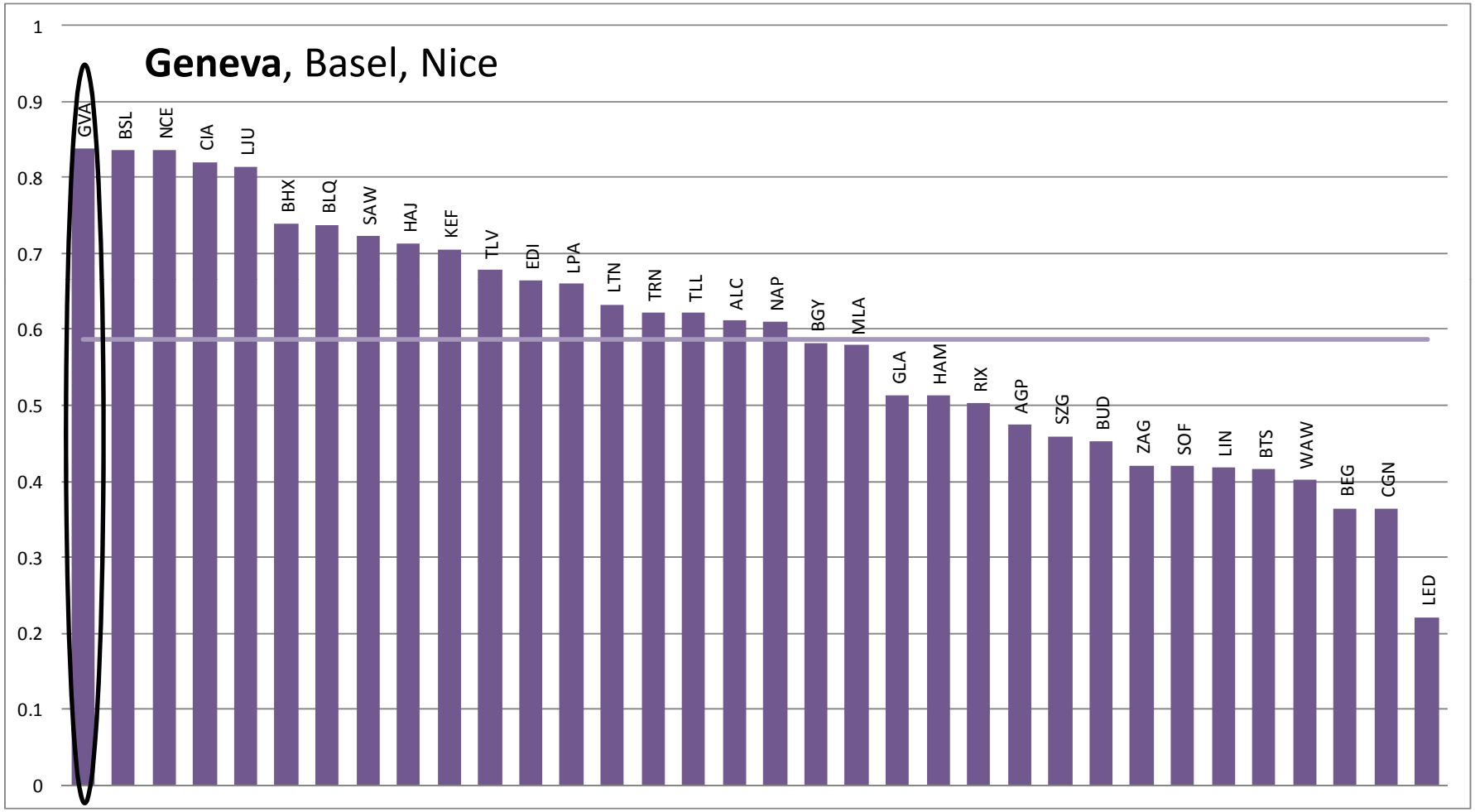
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP): OCEANIA (SYD=1.0), FY 2011



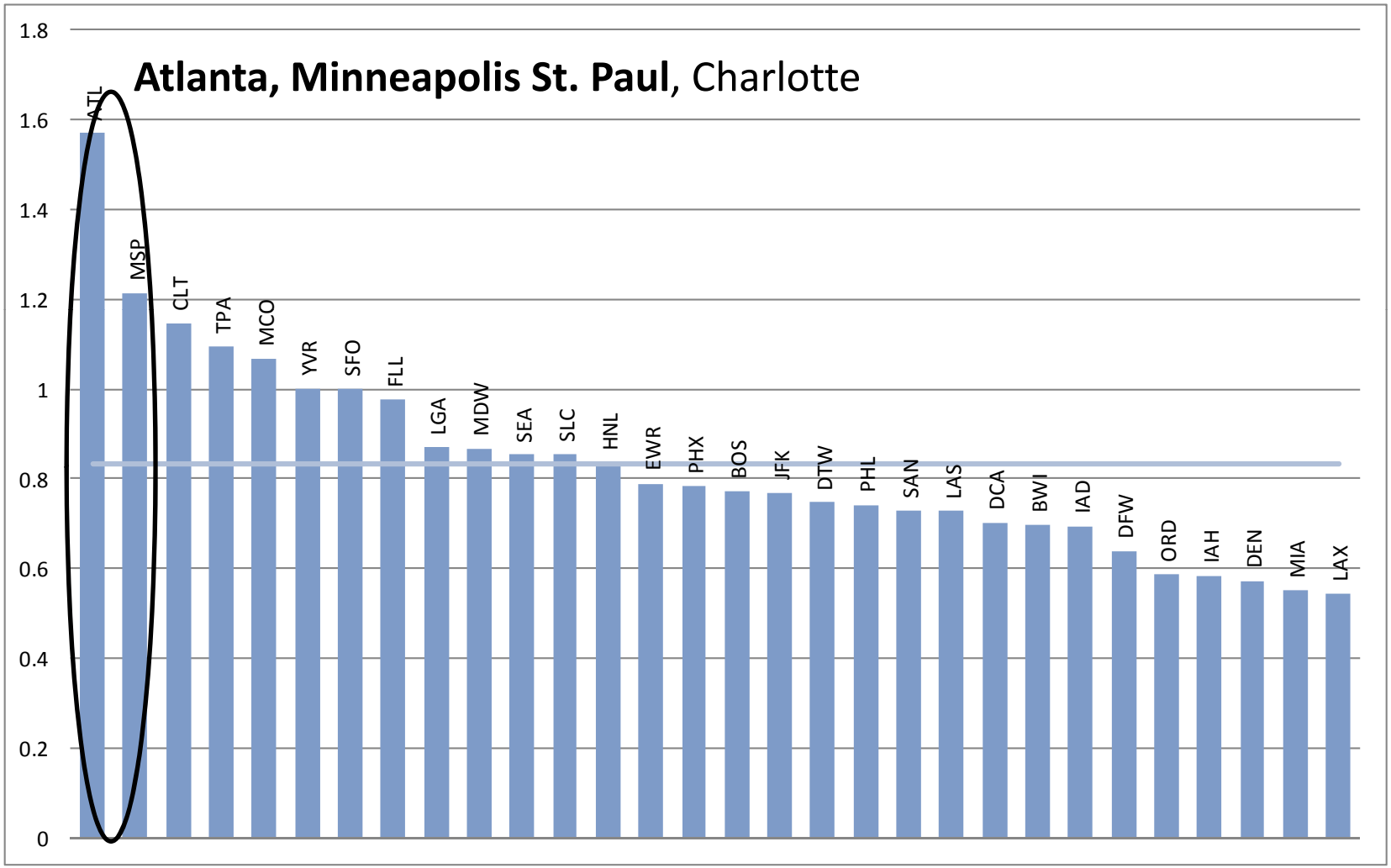
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP):
EUROPE LARGE AIRPORTS (CPH=1.0), FY 2011



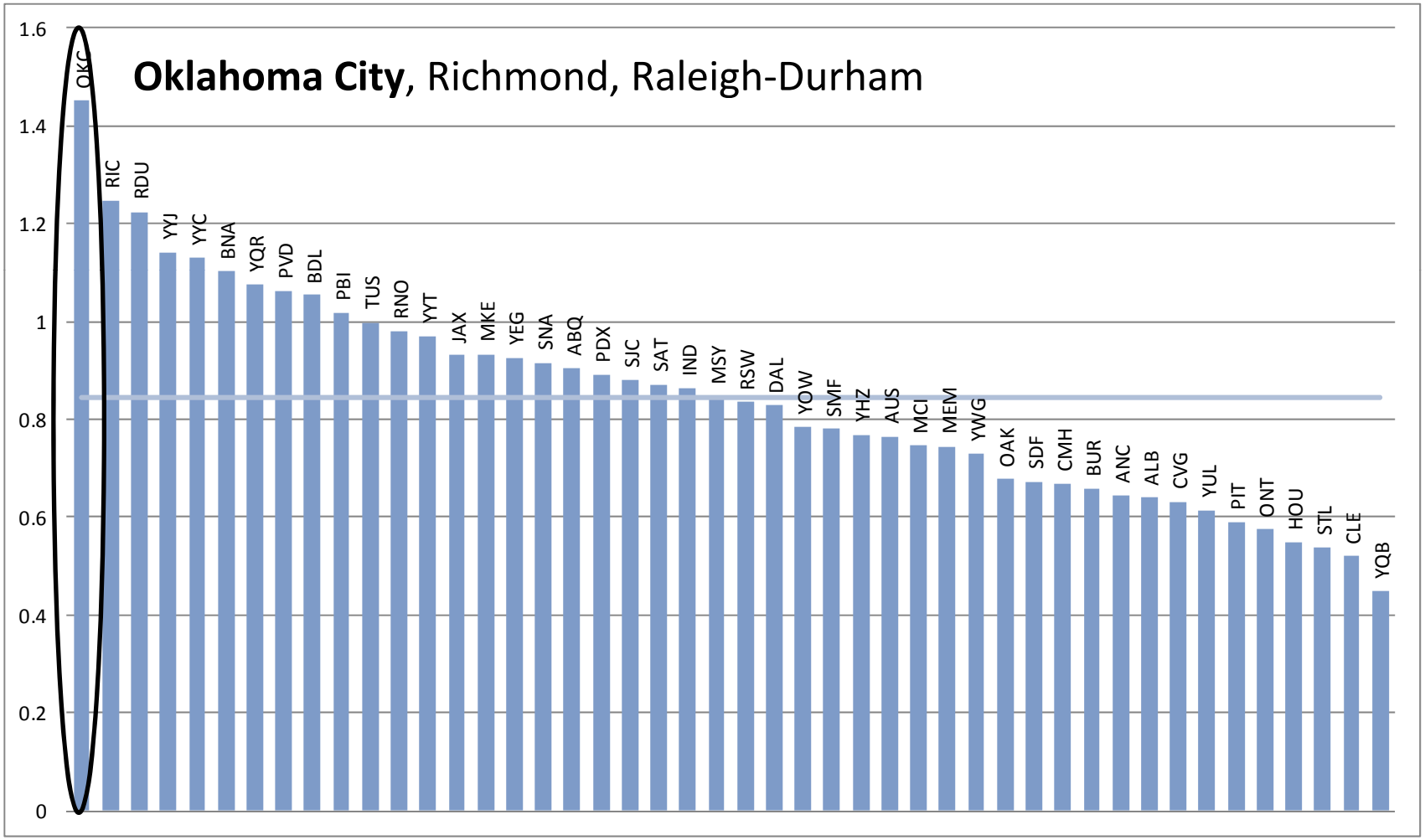
RESIDUAL (NET) VARIABLE FACTOR PRODUCTIVITY (VFP):
EUROPE SMALL & MEDIUM AIRPORTS (CPH=1.0), FY 2011



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



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



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)

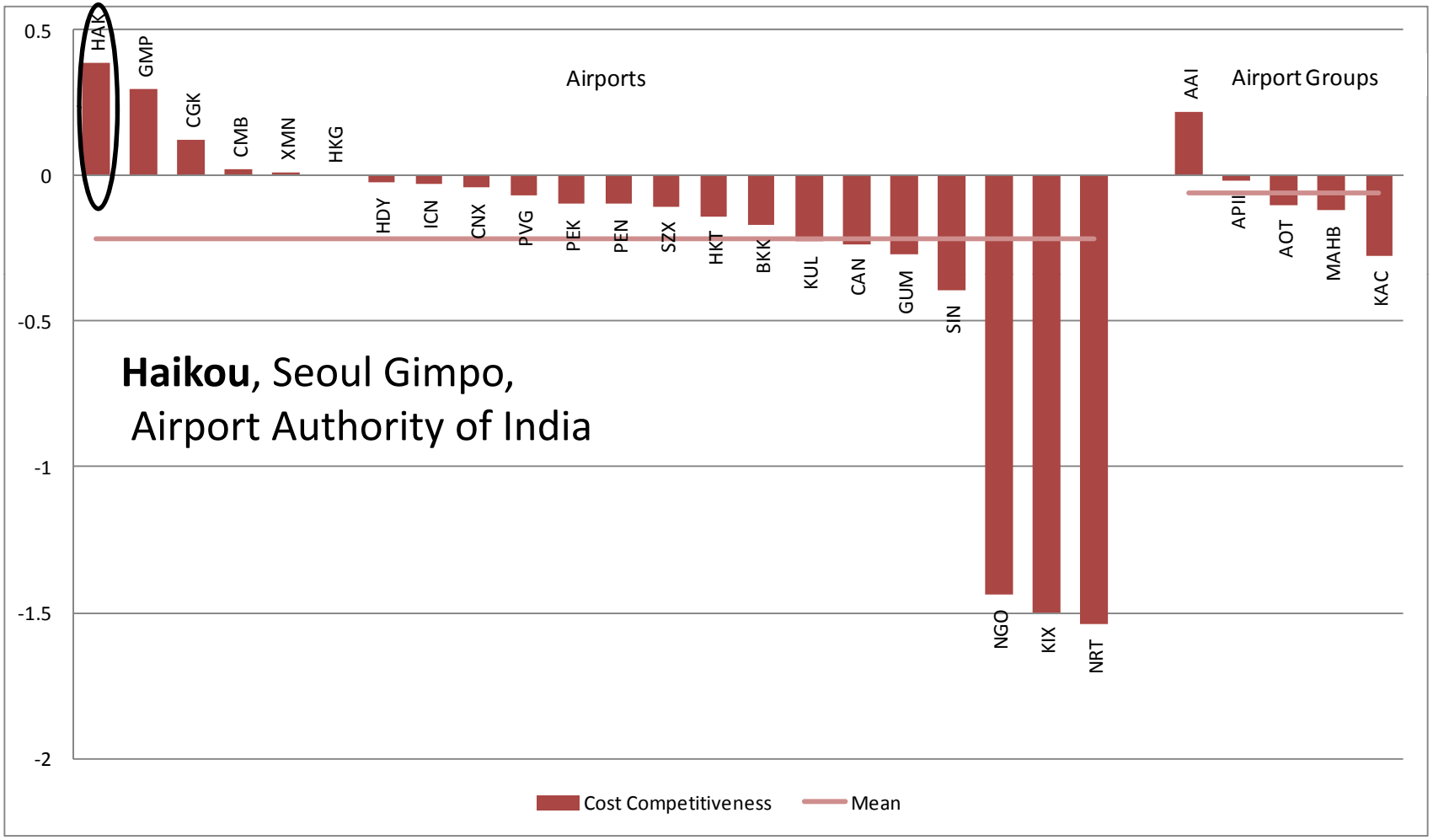
- **Hartsfield-Jackson Atlanta International Airport**

PAST AIRPORT EFFICIENCY EXCELLENCE TOP PERFORMERS, 2008 - 2012

	2008	2009	2010	2011	2012
North America	**Hartsfield-Jackson Atlanta International Airport**	**Hartsfield-Jackson Atlanta International Airport**	**Hartsfield-Jackson Atlanta International Airport**	**Hartsfield-Jackson Atlanta International Airport**	**Hartsfield-Jackson Atlanta International Airport**
Europe	**Copenhagen Kastrup International Airport**	**Copenhagen Kastrup International Airport**	Large Airport Category: **Oslo International Airport** Small/Medium Airport Category: **Geneva Cointrin International Airport**	Large Airport Category: **Oslo International Airport** **Copenhagen Kastrup International Airport** Small/Medium Airport Category: **Genève Aéroport**	Large Airport Category: **Copenhagen Kastrup International Airport** Small/Medium Airport Category: **Genève Aéroport**
Asia-Pacific	**Hong Kong International Airport**	**Hong Kong International Airport**	Large Airport Category: **Hong Kong International Airport** Small/Medium Airport Category: **Seoul Gimpo International Airport**	Asian Airport Excellence Award: **Hong Kong International Airport** Oceania Excellence Award: **Sydney Airport**	Asian Airport Excellence Award: **Seoul Gimpo International Airport** Oceania Excellence Award: **Sydney Airport**

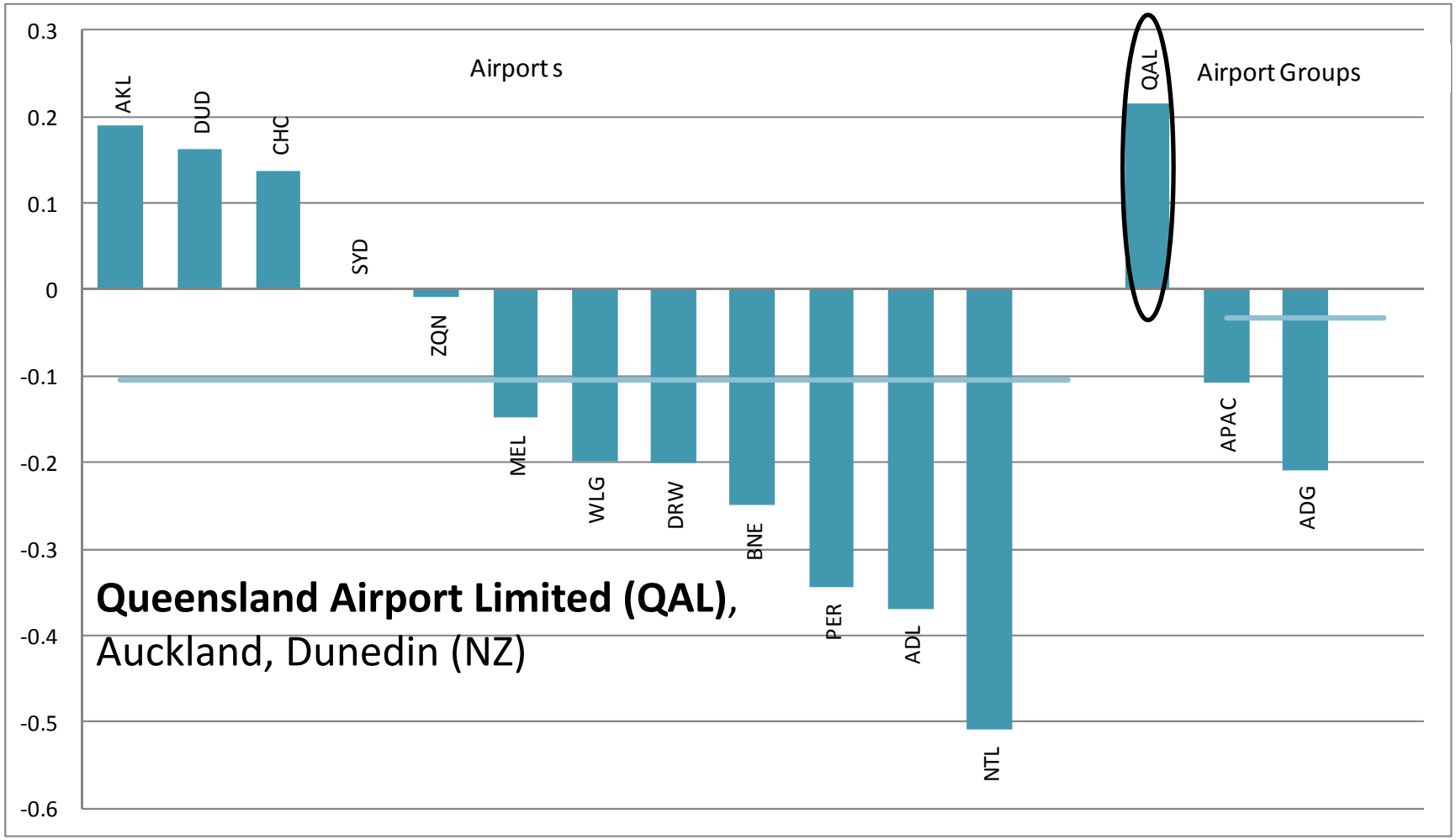
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

ASIA (HKG=0.0) – *THE HIGHER THE BETTER*



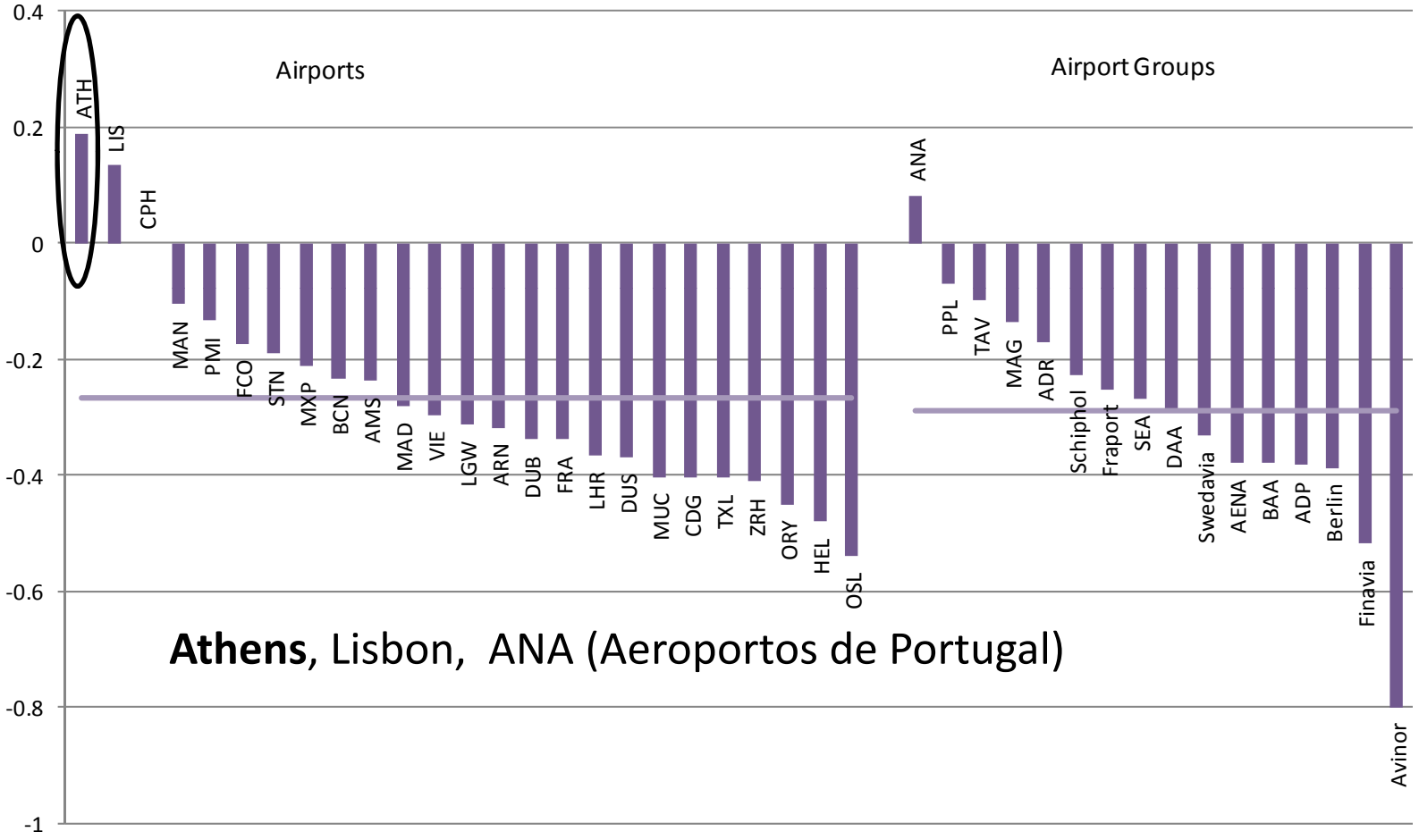
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

OCEANIA (SYD=0.0)



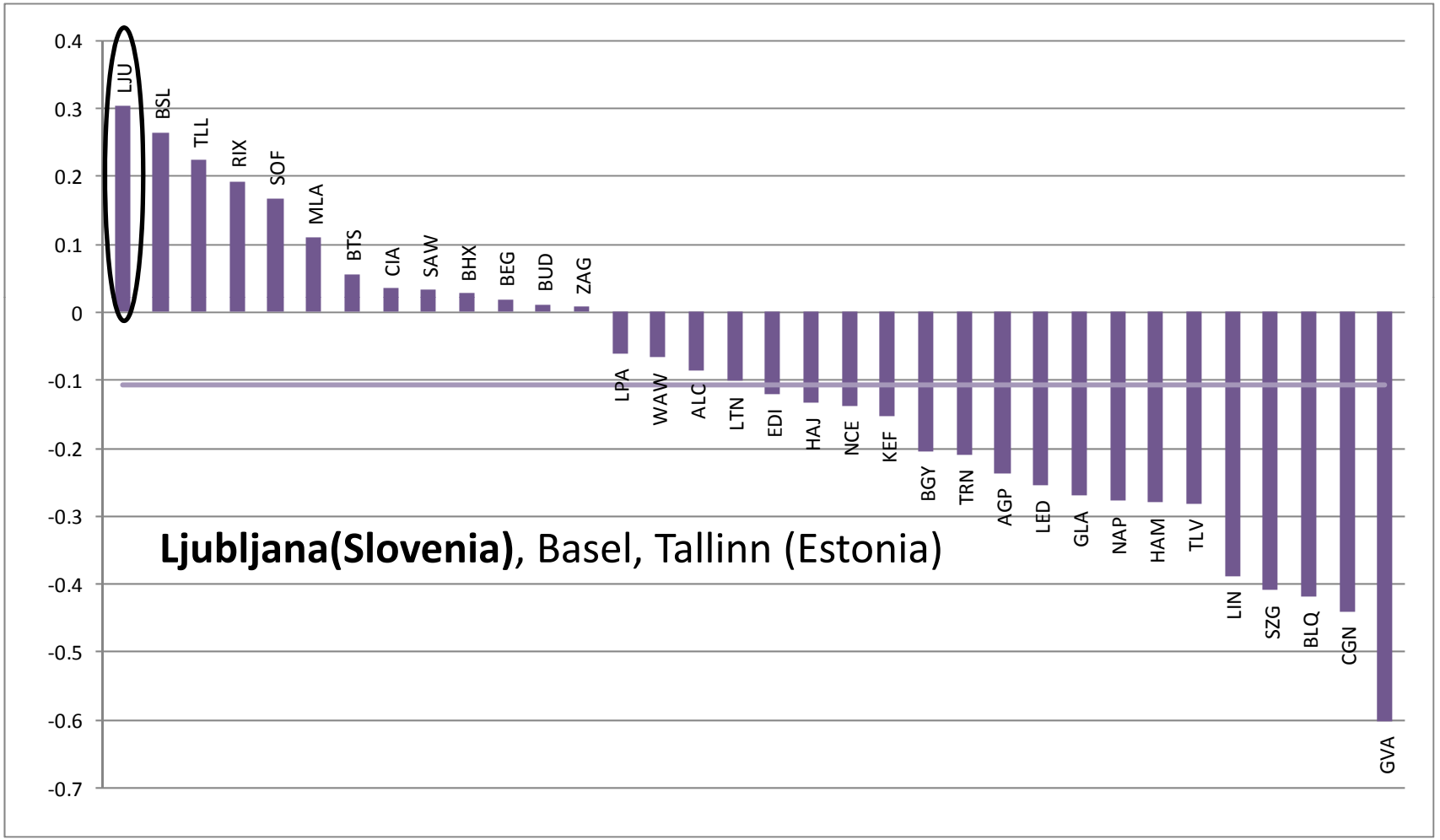
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

EUROPE - LARGE AIRPORTS (CPH=0.0)



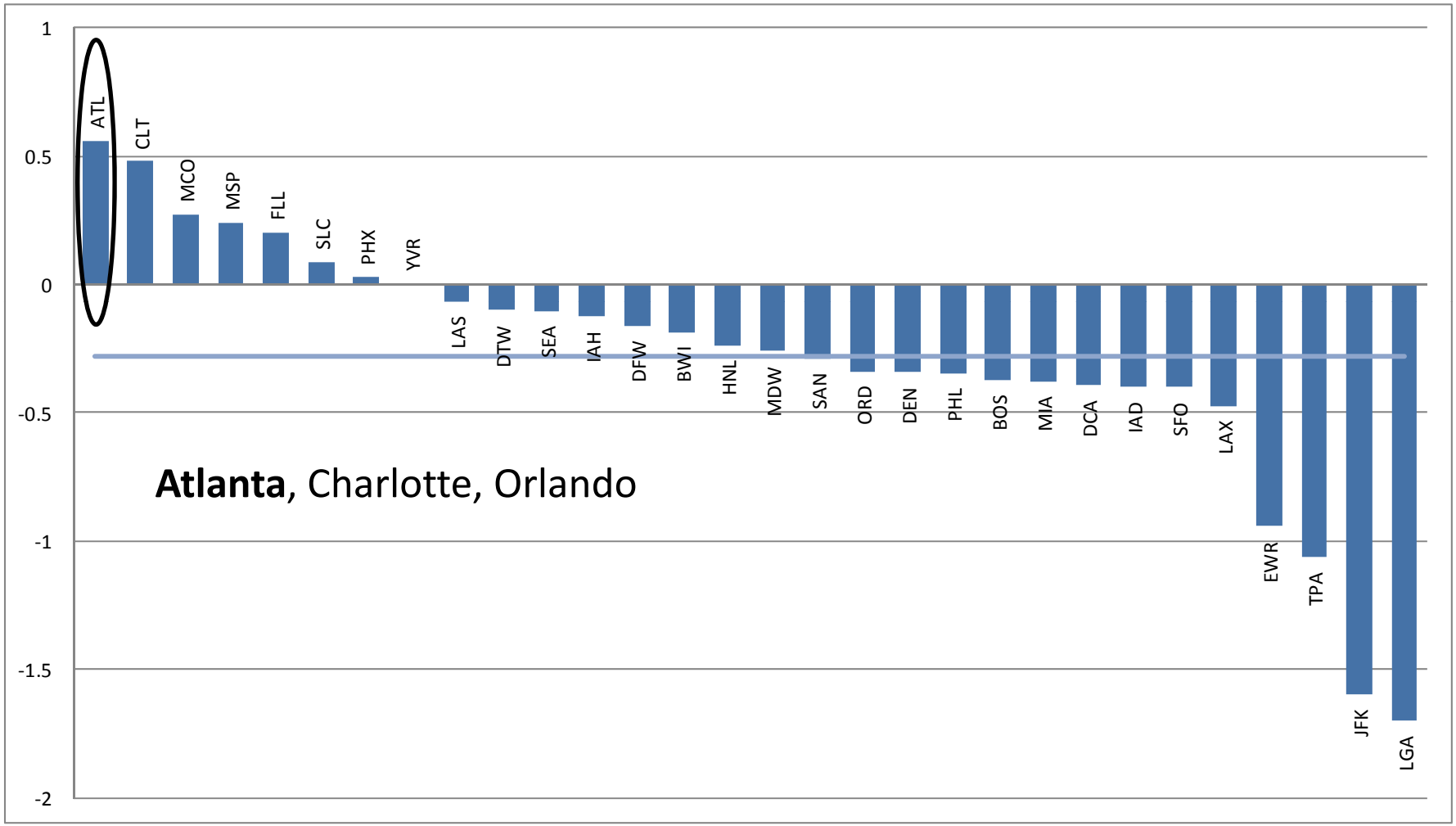
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

EUROPE - SMALL & MEDIUM AIRPORTS (CPH=0.0)



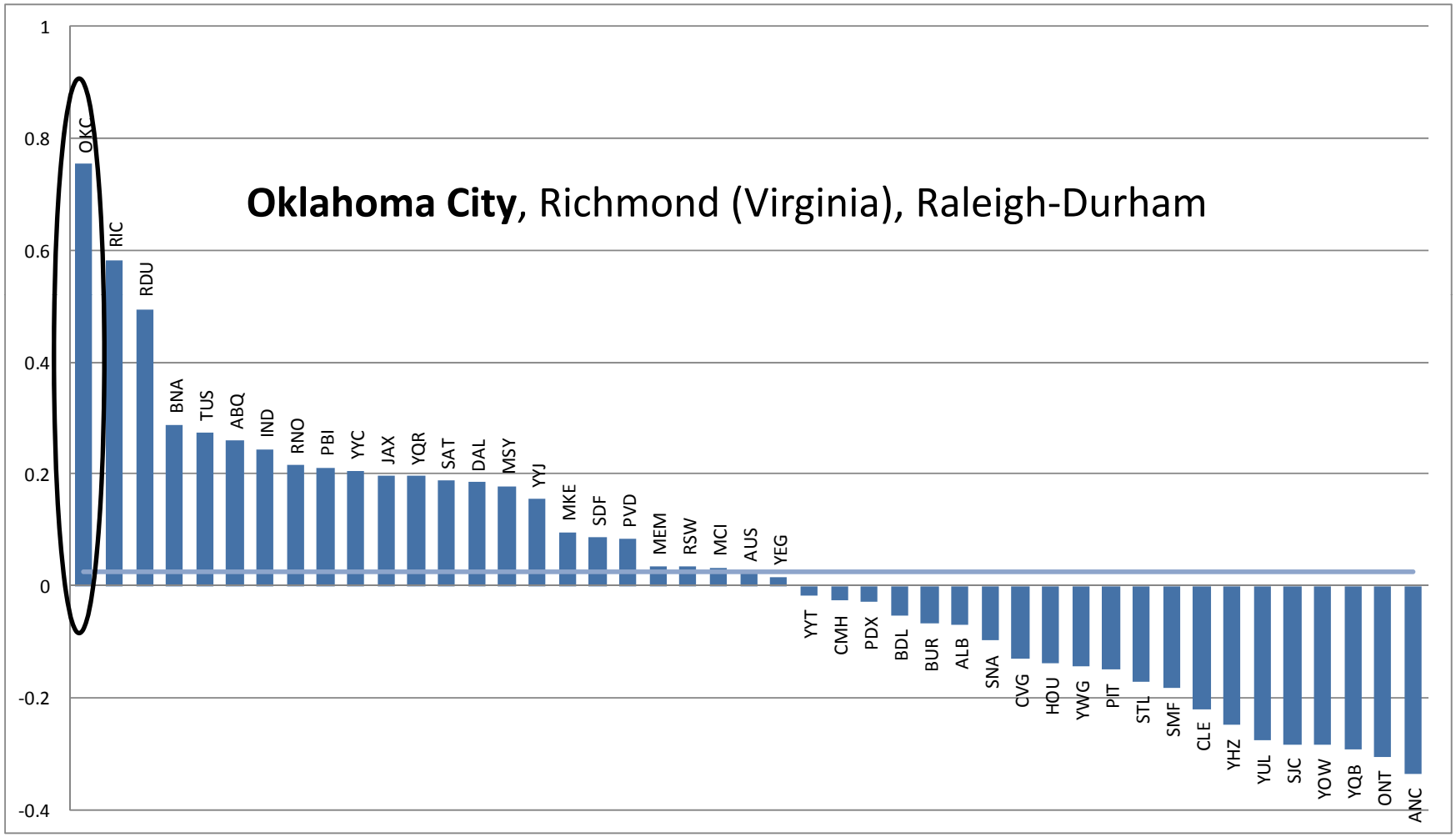
COST COMPETITIVENESS = NET VFP AND INPUT PRICE EFFECT

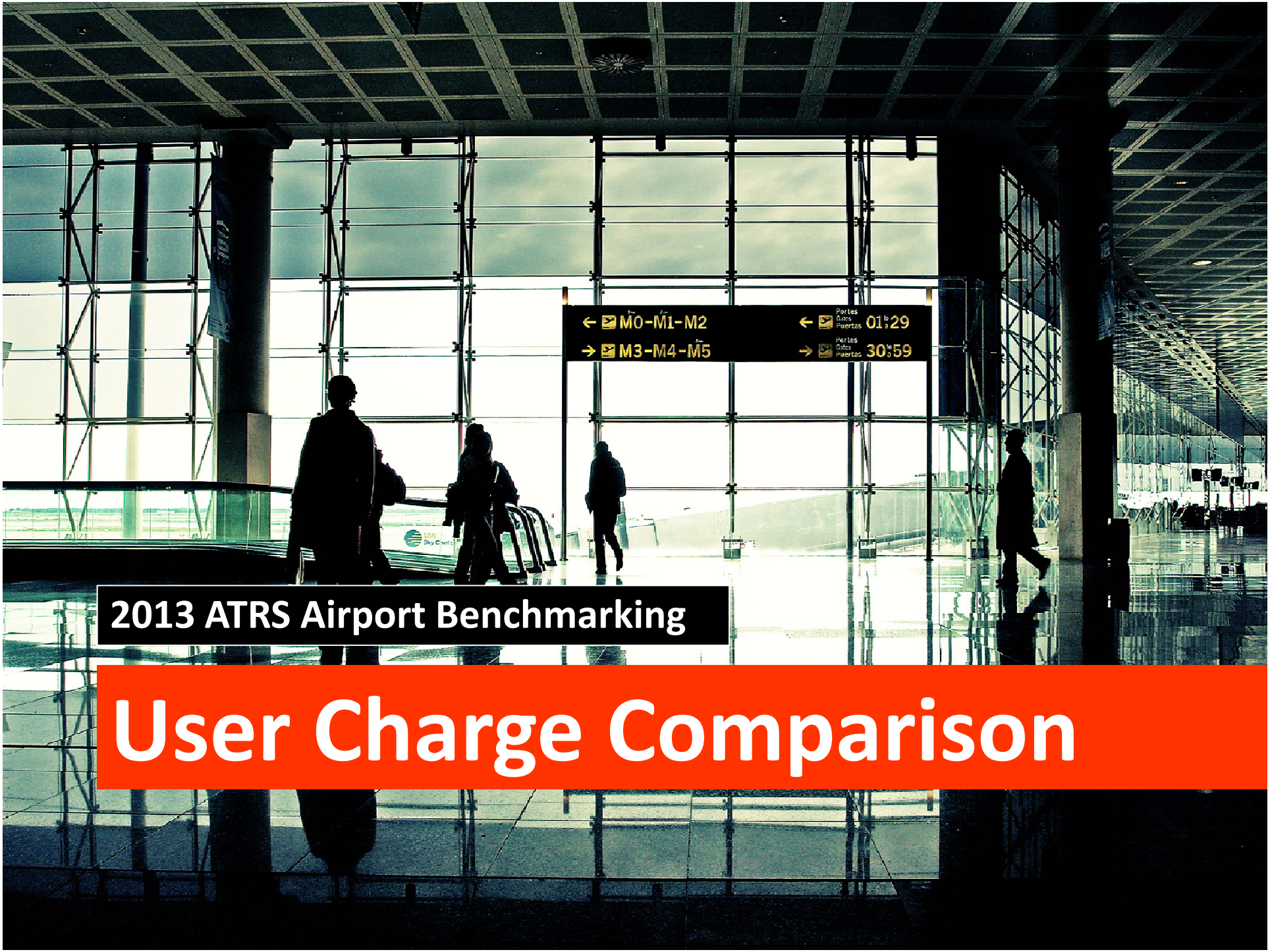
N. AMERICA - LARGE AIRPORTS (YVR=0.0)



COST COMPETITIVENESS: = NET VFP AND INPUT PRICE EFFECT

N. AMERICA - SMALL & MEDIUM AIRPORTS (YVR=0.0)





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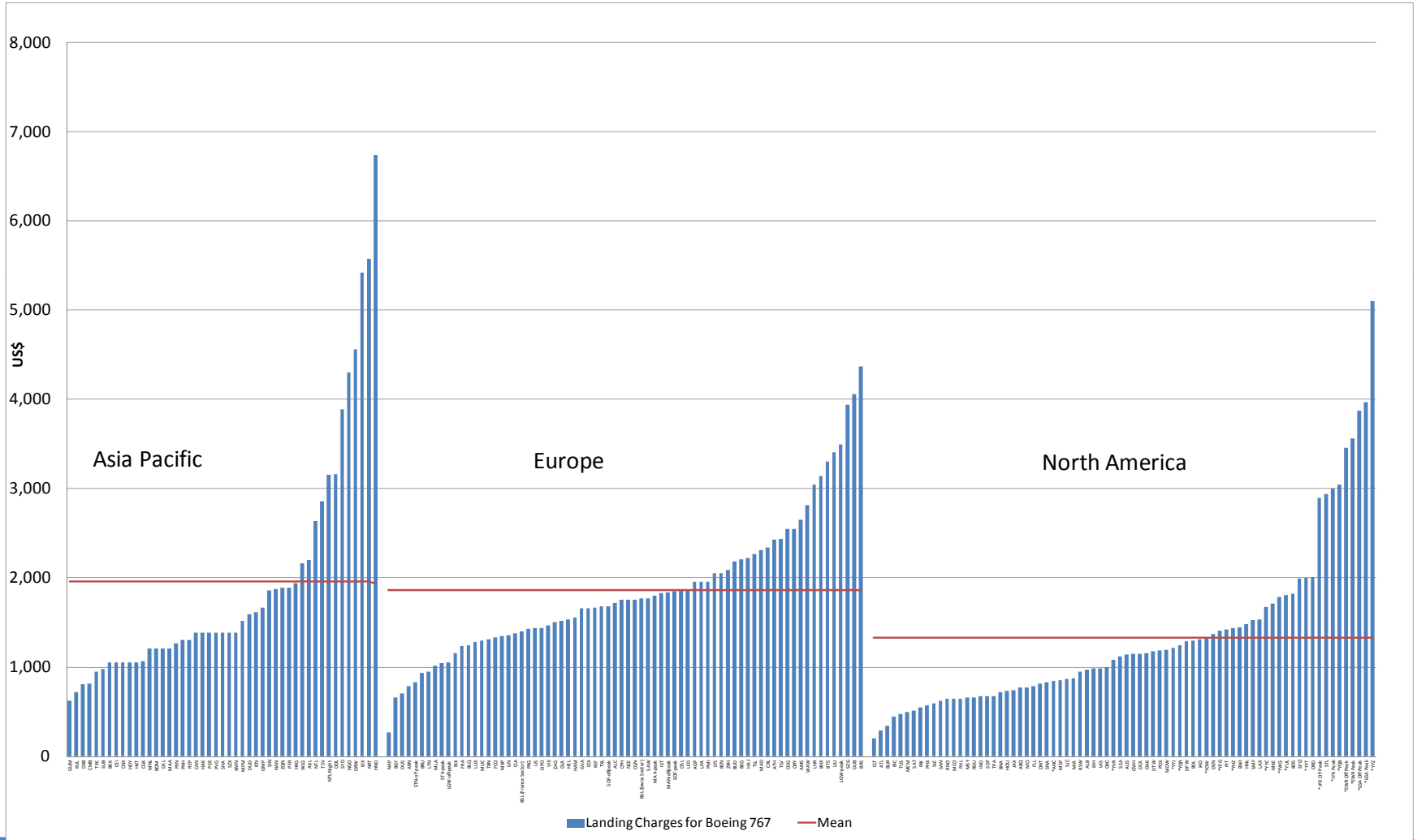
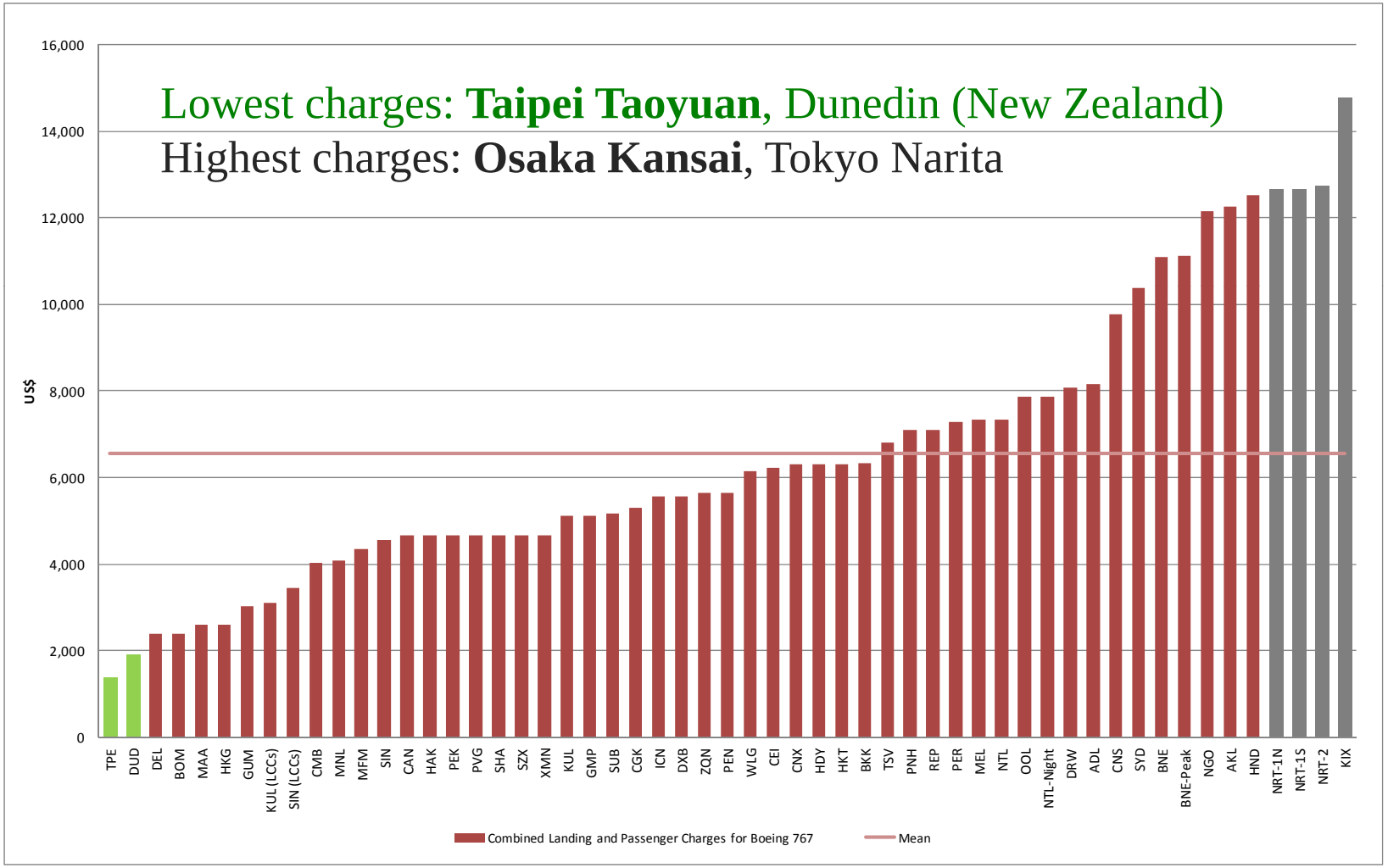
User Charge Comparison

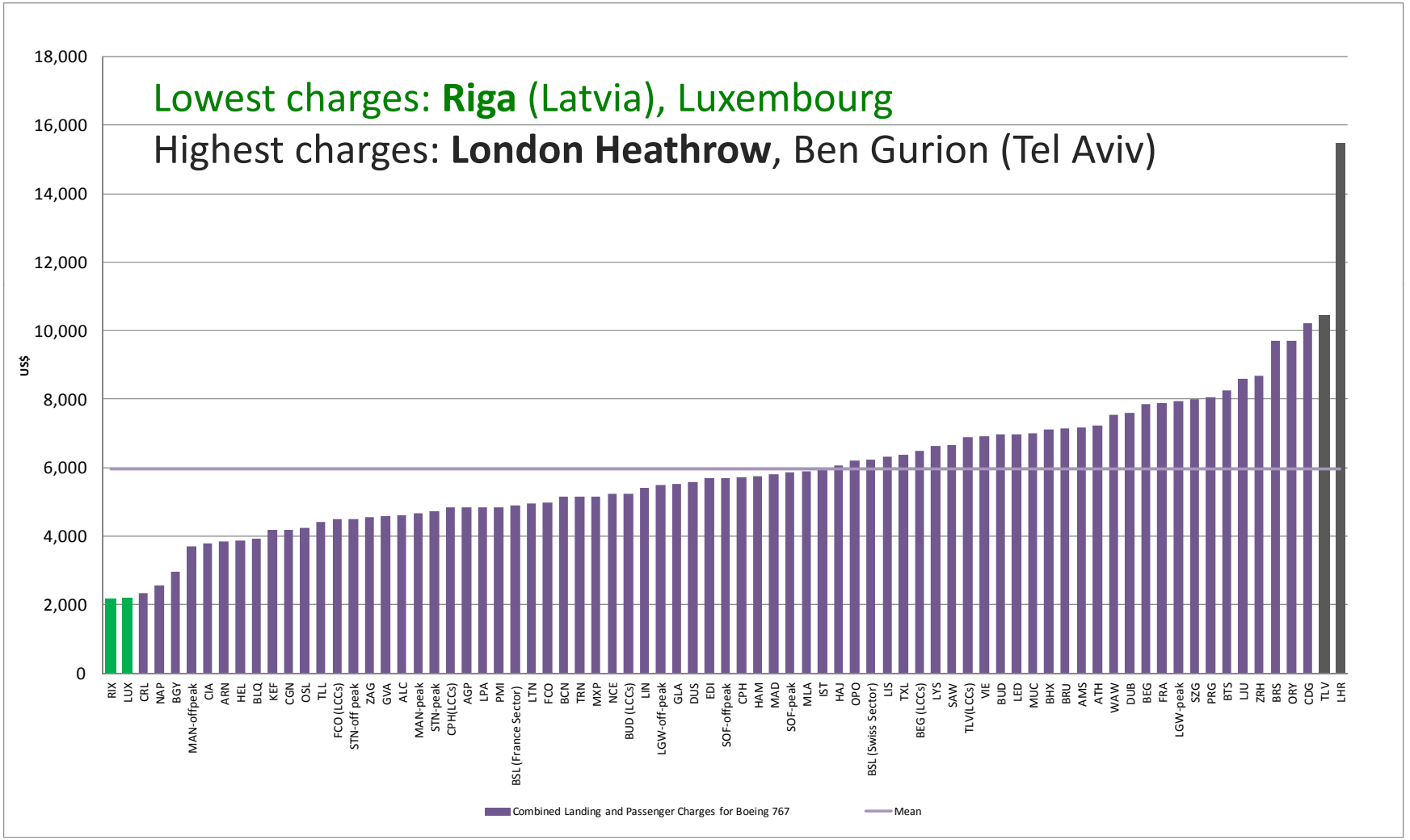
LANDING CHARGES
FOR BOEING 767-400, 2012 (IN US$)



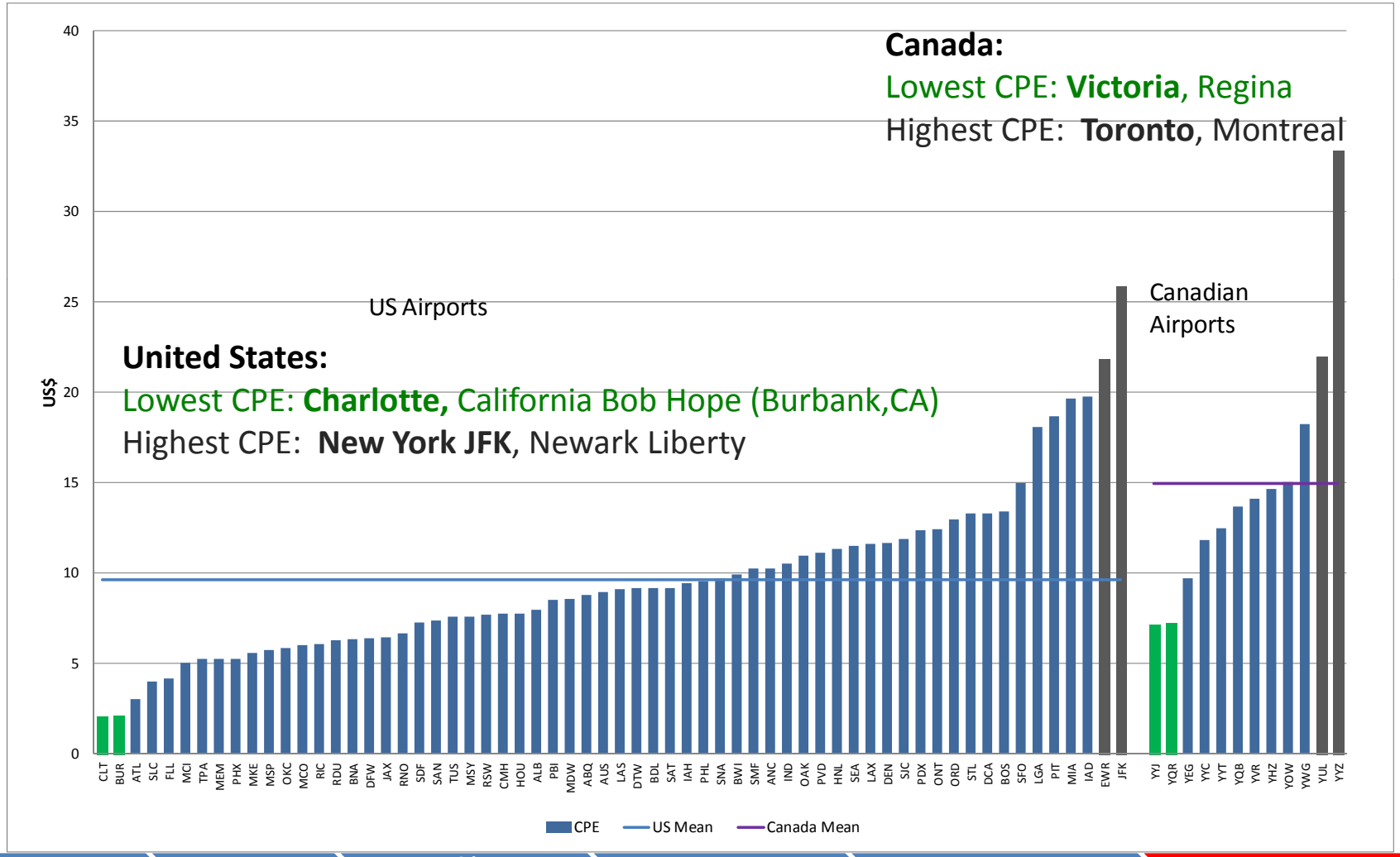
ASIA PACIFIC: COMBINED LANDING AND PASSENGER CHARGES FOR BOEING 767, 2012 (IN US$)



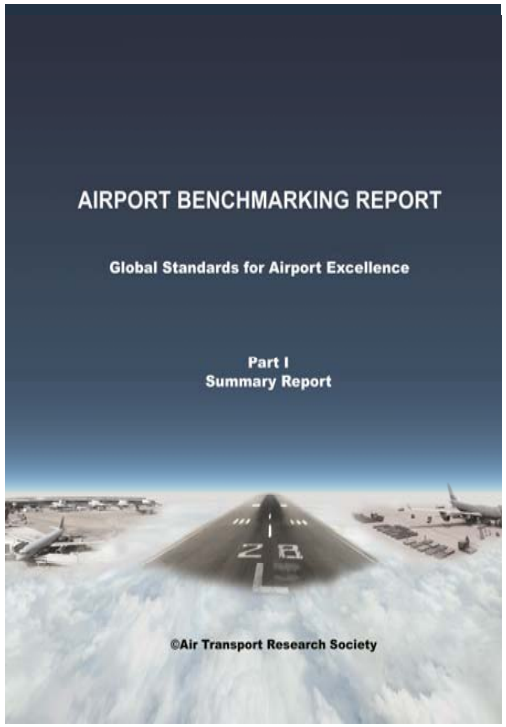
EUROPE: COMBINED LANDING AND PASSENGER CHARGES FOR BOEING 767, 2012 (IN US$)



NORTH AMERICA: COST PER ENPLANED PASSENGER, 2011 (IN US$)



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**

ACKNOWLEDGEMENT OF APPRECIATION

Gold Corporate Members

Houston Airport System

Hartsfield-Jackson Atlanta International Airport

Corporate Members

- Vancouver Airport Authority
- Gatwick Airport Ltd
- Copenhagen International Airport
- Istanbul Sabiha Gockcen International Airport
- Korea Airports Corporation
- Kazan international airport, Russia
- German Aerospace Center
- Airbus
- Boeing

Thank You

2014 ATRS World Conference

(Bordeaux, France, July 17-20, 2014)