Key Findings

Chunyan Yu

Air Transport Research Society (ATRS)

ww.atrsworld.org

ATRS Global Airport Performance Benchmarking Task Force:
Founding Chairman – Tae Oum; Coordinator - Chunyan Yu
Asia Pacific: Peter Forsyth, Xiaowen Fu, Yeong-Heok Lee, Yuichiro Yoshida, Japhet Law, Shinya Hanaoka
Europe: Nicole Adler, Jaap de Wit, Hans-Martin Niemeier, Eric Pels
North America: Bijan Vasigh, Jia Yan, Chunyan Yu
Middle East: Paul Hooper

Outline

Objective of the ATRS Benchmarking Study

Airports Included and ATRS Database

Characteristics of Sample Airports

Methodology

Key Results on Efficiency and Cost Competitiveness

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 Charges**

❑ Limitation: Service Quality is not considered

Airports included in the 2016 Report

Canada-US   82 airports

Europe   70 airports
                     15 airport groups

Asia Pacific   9 airport groups
                     38 Asian airports
   15 Oceania airports

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Total   205 airports
                      24 airport groups

The ATRS Database

❑ The ATRS Database contains historic information (FY 2002-2014) 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 regions is segregated into:

- **Airport Information** (capacity, type of ownership etc)
- **Traffic**
- **Aeronautical Revenue**
- **Non-Aeronautical Revenue**
- **Operating Expense**
- **Balance Sheet**

❑ Visit http://www.atrsworld.org/publications.html for more details.

Airport Characteristics

❑ Number of passengers ranges from 853,097 at Dunedin (New Zealand) to 96.2 million at Atlanta (United States) in 2014

❑ 40 airports with only 1 runway, and 7 runways at DFW and 8 at ORD

❑ Number of Employees ranges from 19 (Queenstown) to 19,919 (Frankfurt)

❑ 12 airports serve only international passengers, and international passengers account for less than 10 % of total traffic at 60 airports
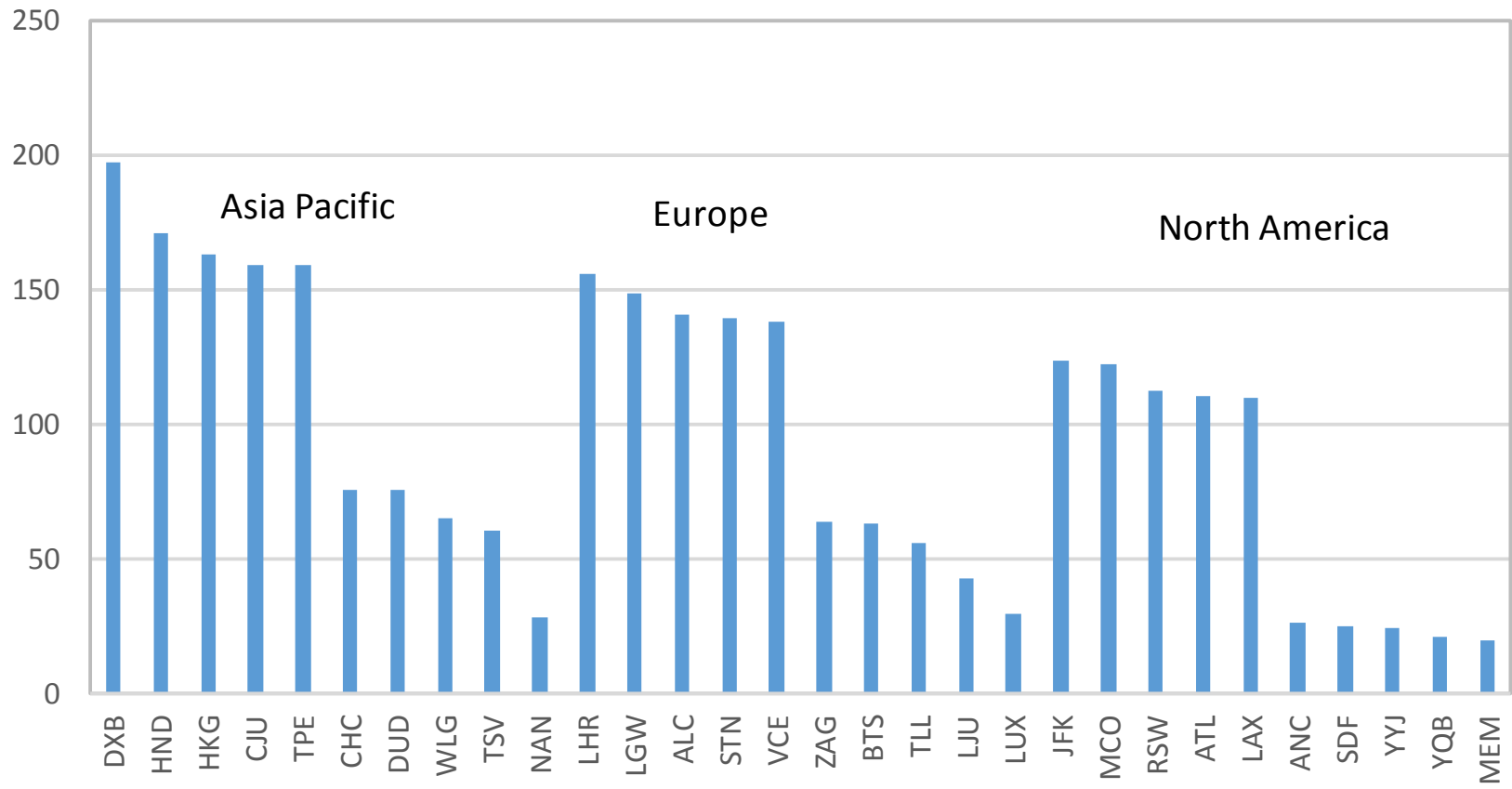
Passenger Traffic, 2014

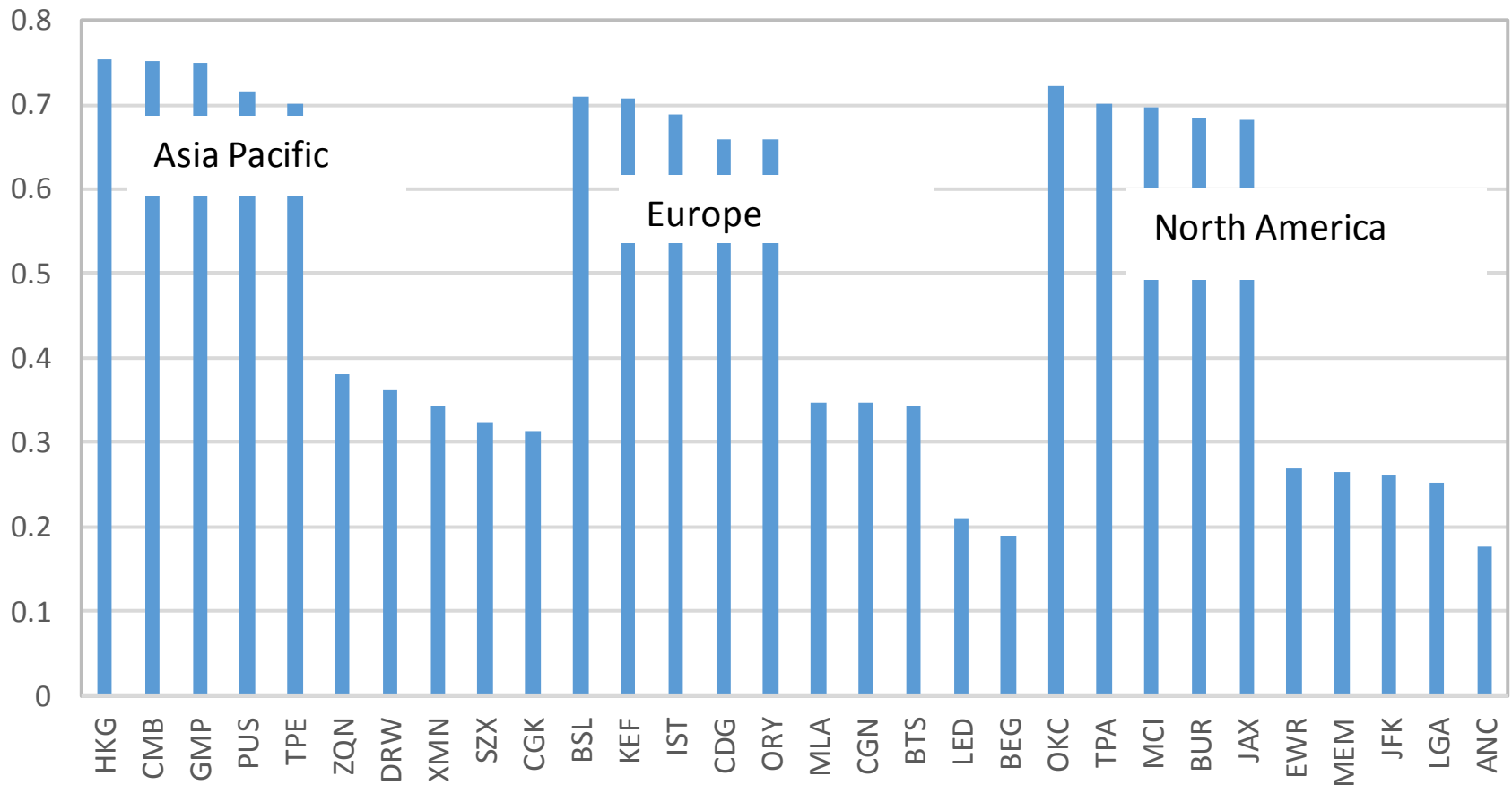## Largest Five and Smallest Five ('000)
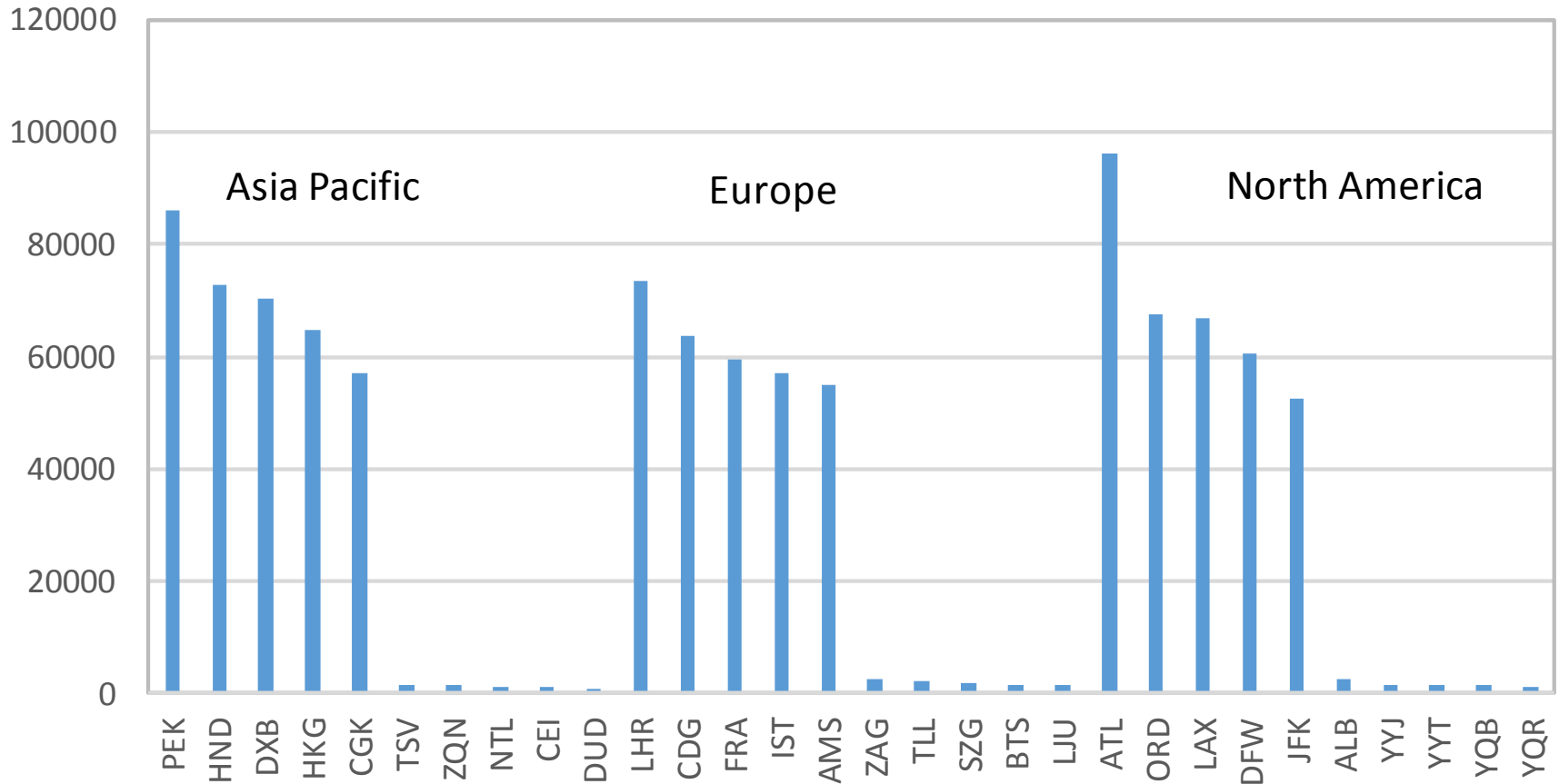
Highest Five and Lowest Five

Highest Five and Lowest Five

Methodology

- **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)

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

$$ln\frac{X_i}{X_j} = \sum \frac{W_{ki} + \bar{W}_k}{2} \, ln\frac{X_{ki}}{\tilde{X}_k} - \sum \frac{W_{kj} + \bar{W}_k}{2} ln\frac{X_{kj}}{\tilde{X}_k}$$

Methodology

Inputs	Outputs
• Labour • Other non-capital (soft-cost) input	• Aircraft movement • Passenger • Non-aeronautical revenue • (Cargo)

→ **Gross Variable Factor Productivity**

Methodology

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

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.
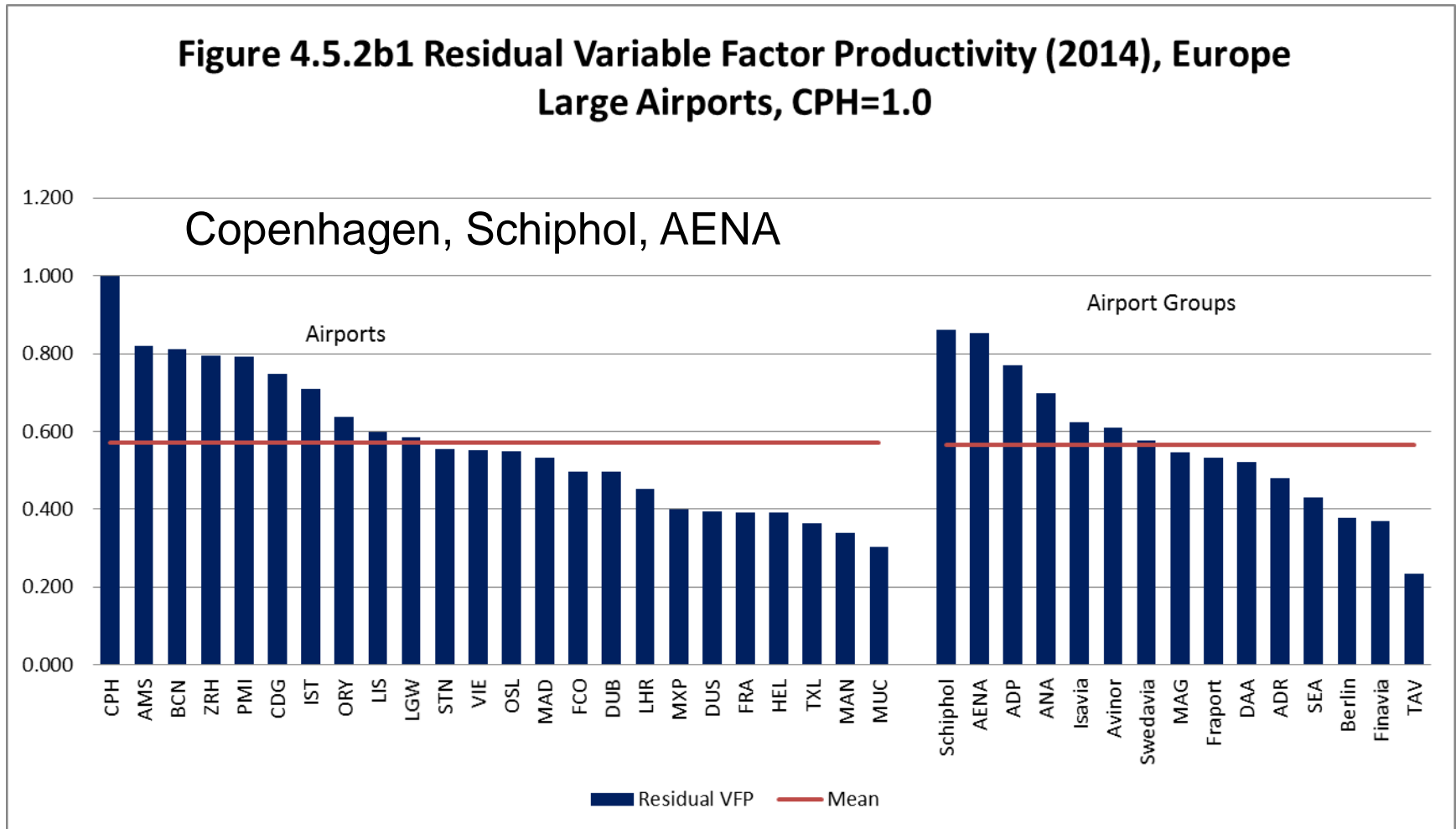
14

Figure 4.5.2a1 Residual Variable Factor Productivity (2014), Asia, HKG=1.0
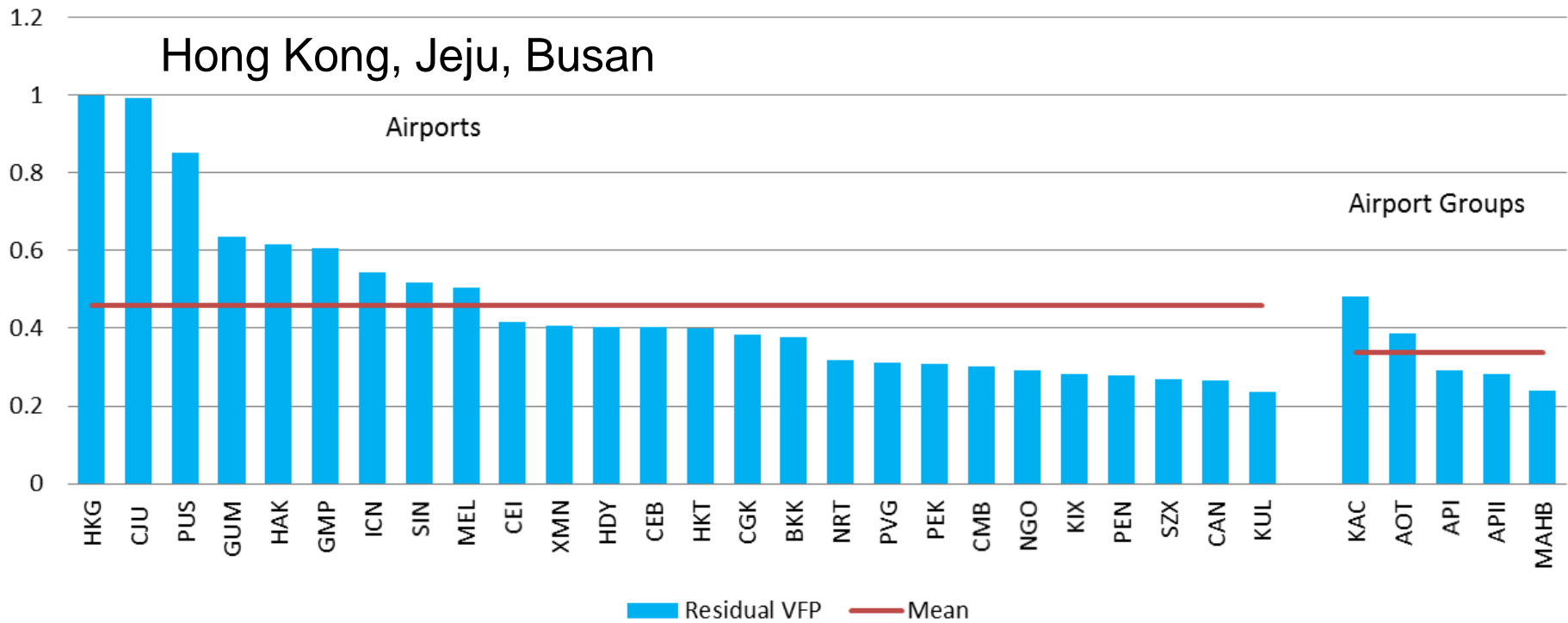
Figure 4.5.2a2 Residual Variable Factor Productivity (2014), Oceania, SYD =1.0
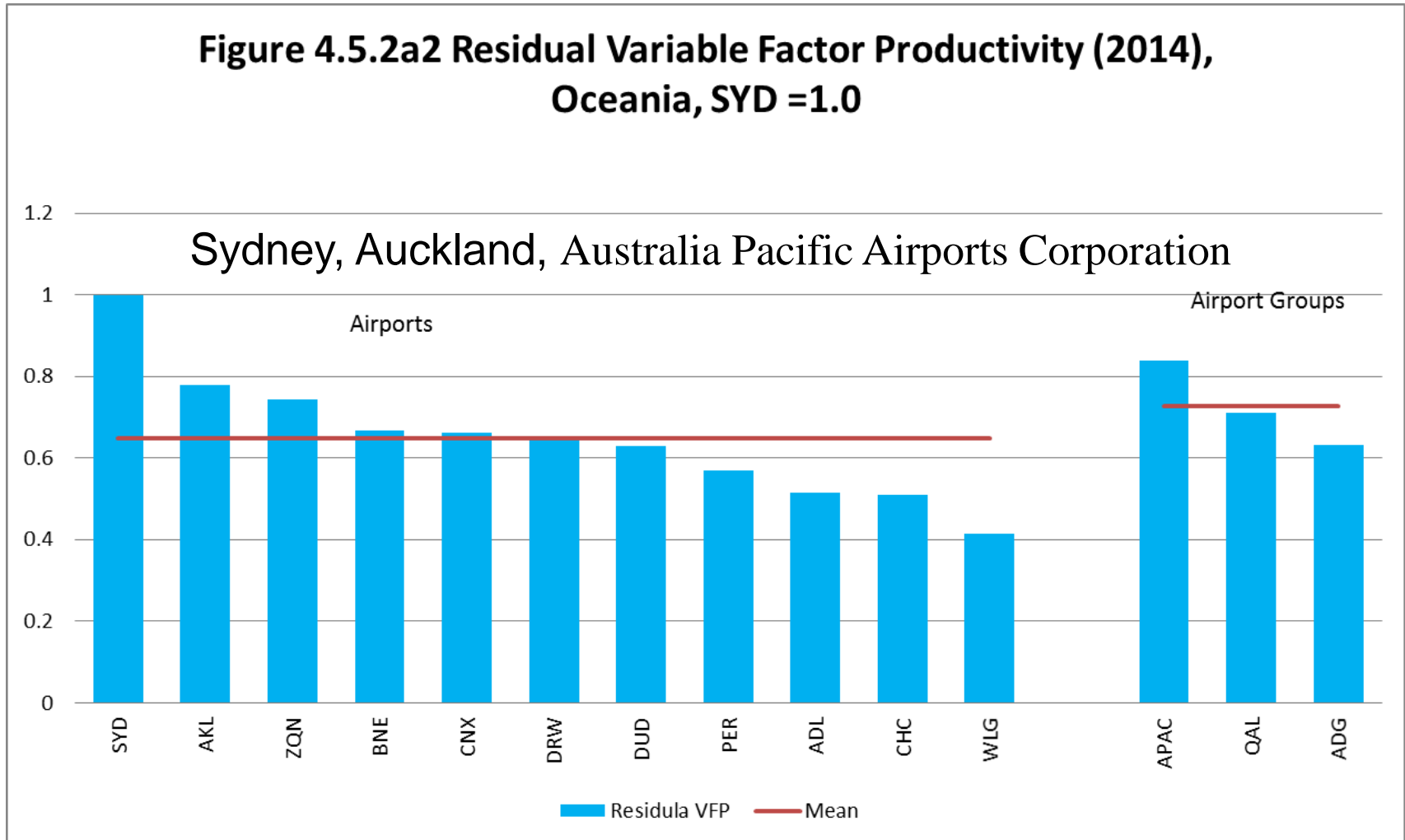
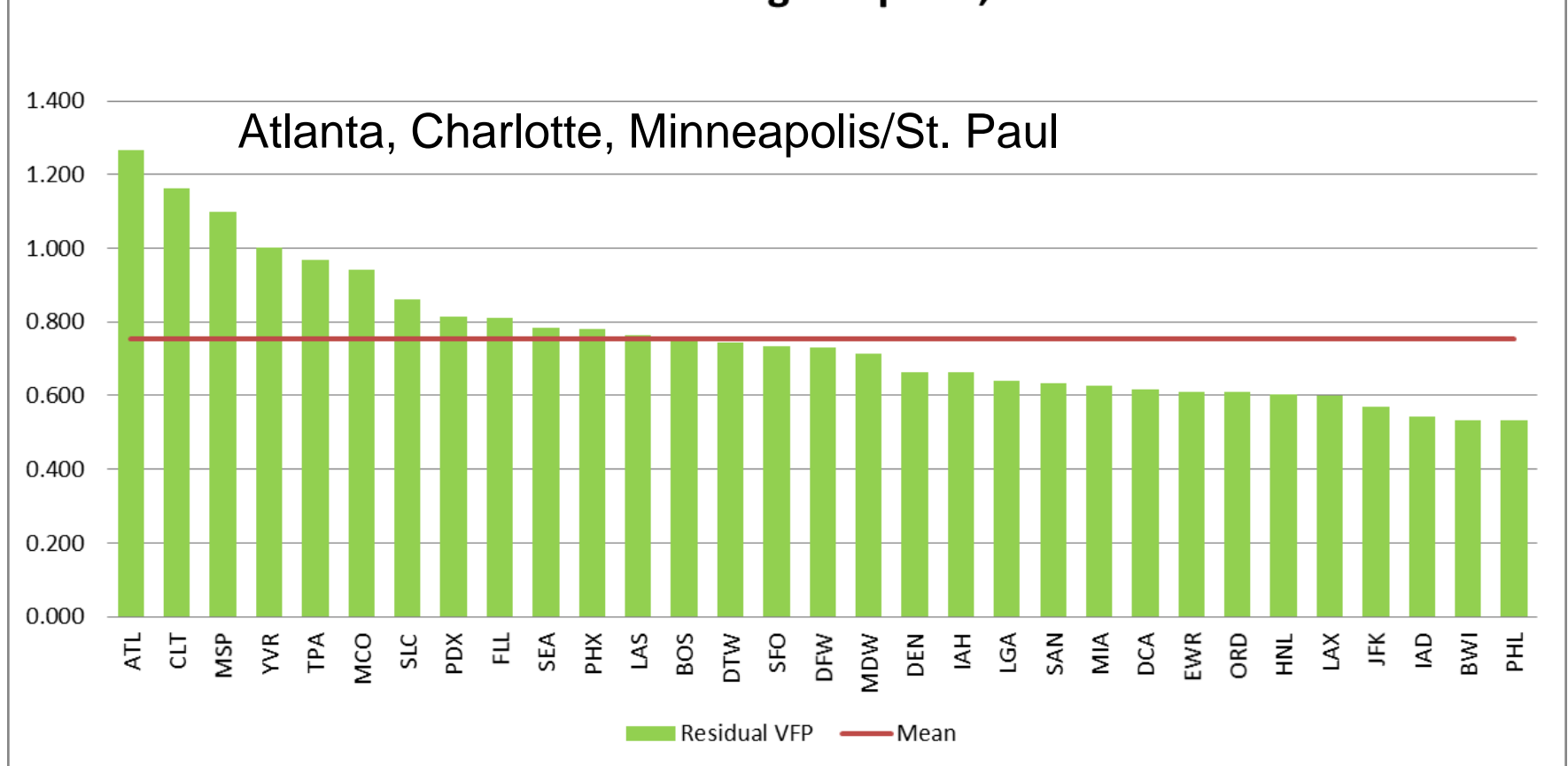Figure 4.5.2b1 Residual Variable Factor Productivity (2014), Europe Large Airports, CPH=1.0

Figure 4.5.2b2 Residual Variable Factor Productivity (2014), Europe Small and Medium Airports, CPH=1.0
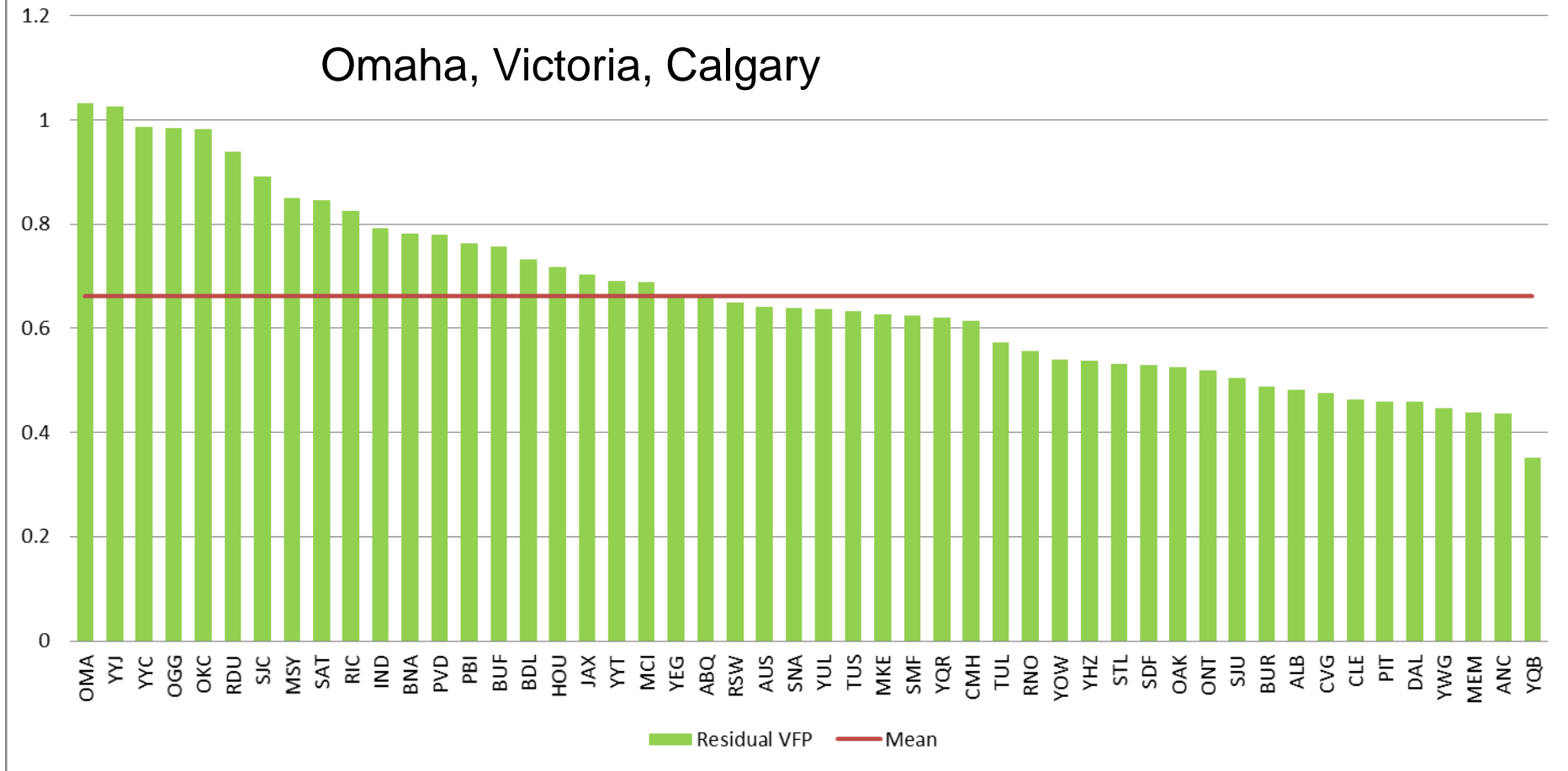
Athens, Alicante Airport, EuroAirport
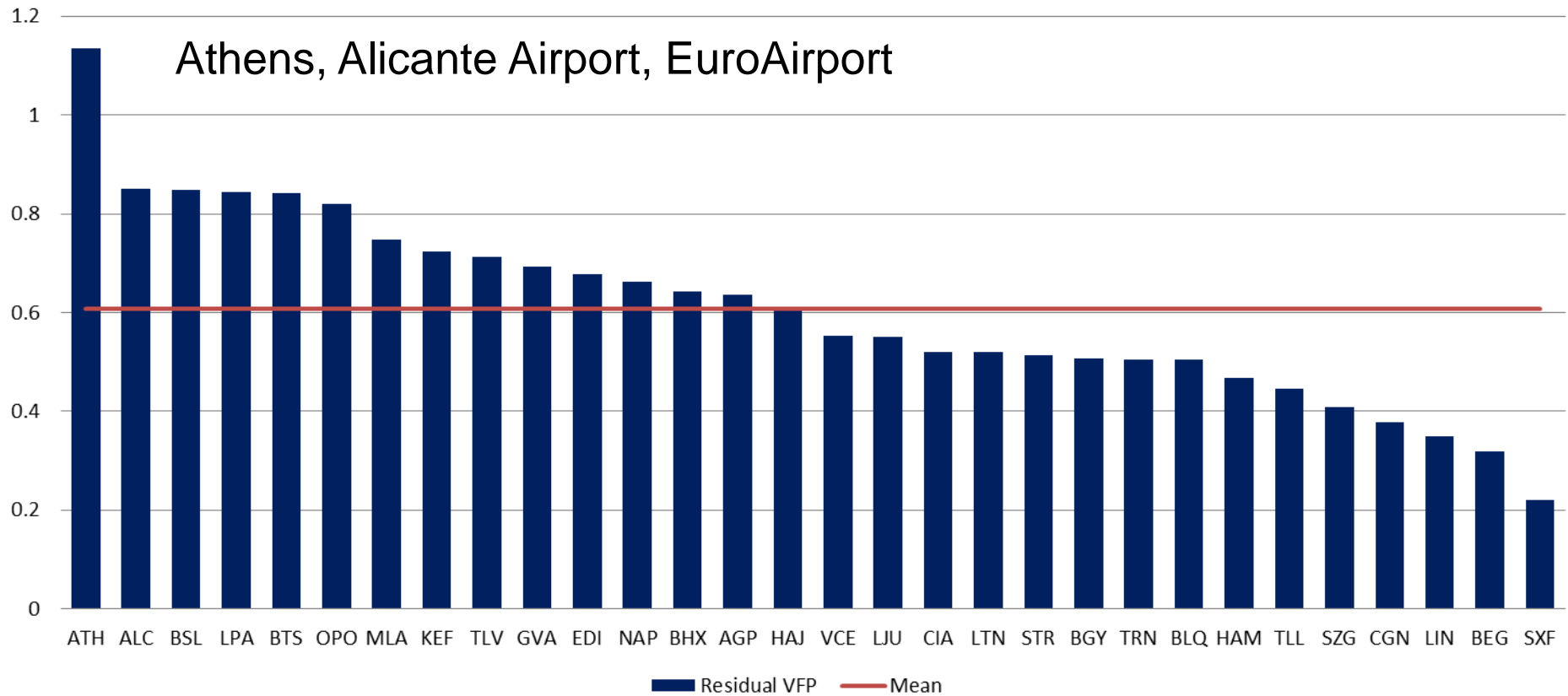
Figure 4.5.2c1 Residual Variable Factor Productivity (2014), North America Large Airports, YVR=1.0

Atlanta, Charlotte, Minneapolis/St. Paul

Figure 4.5.2c2 Residual Variable Factor Productivity (2014), North America Small and Medium Airports, YVR=1.0

Omaha, Victoria, Calgary

Top Efficiency Performers (2016)

Asia Pacific:

- *Asian Airports*:
  - **Hong Kong**, Jeju, Busan
- *Oceania Airports:*
  - **Sydney,** Auckland

Europe:

- *Large Airports (> 15 million pax):*
  - **Copenhagen**, Amsterdam, AENA
- *Small/Medium Airports (< 15 millions Pax):*
  - **Athens,** Alicante Airport, EuroAirport

North America (Canada/US):

- *Large Airports (> 15 million pax):*
  - **Atlanta**, Charlotte, Minneapolis/St Paul
- *Small/Medium Airports (< 15 millions Pax):*
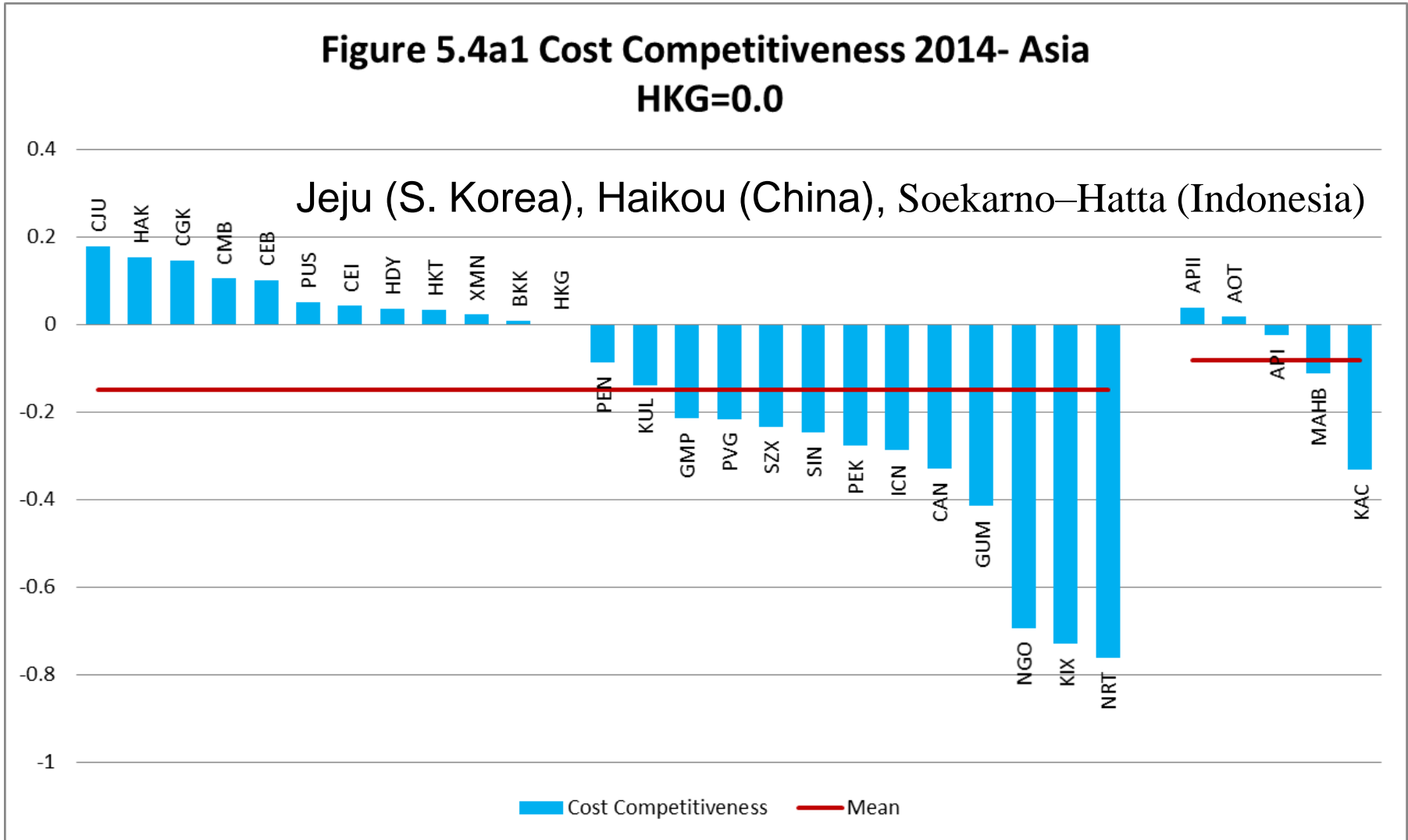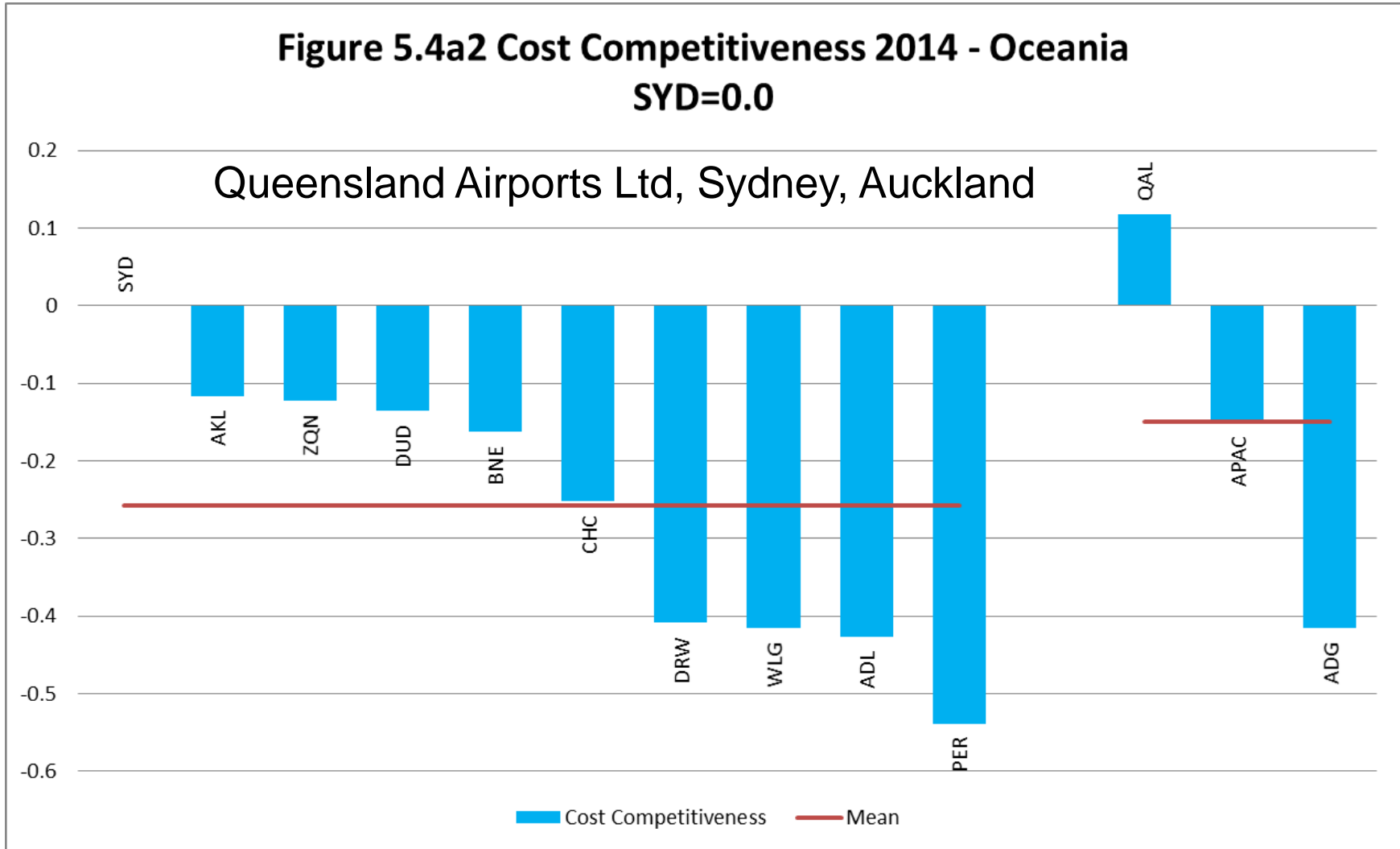 - **Omaha**, Victoria, Calgary

Key Results

- **Cost Competitiveness**

Figure 5.4a1 Cost Competitiveness 2014- Asia
HKG=0.0

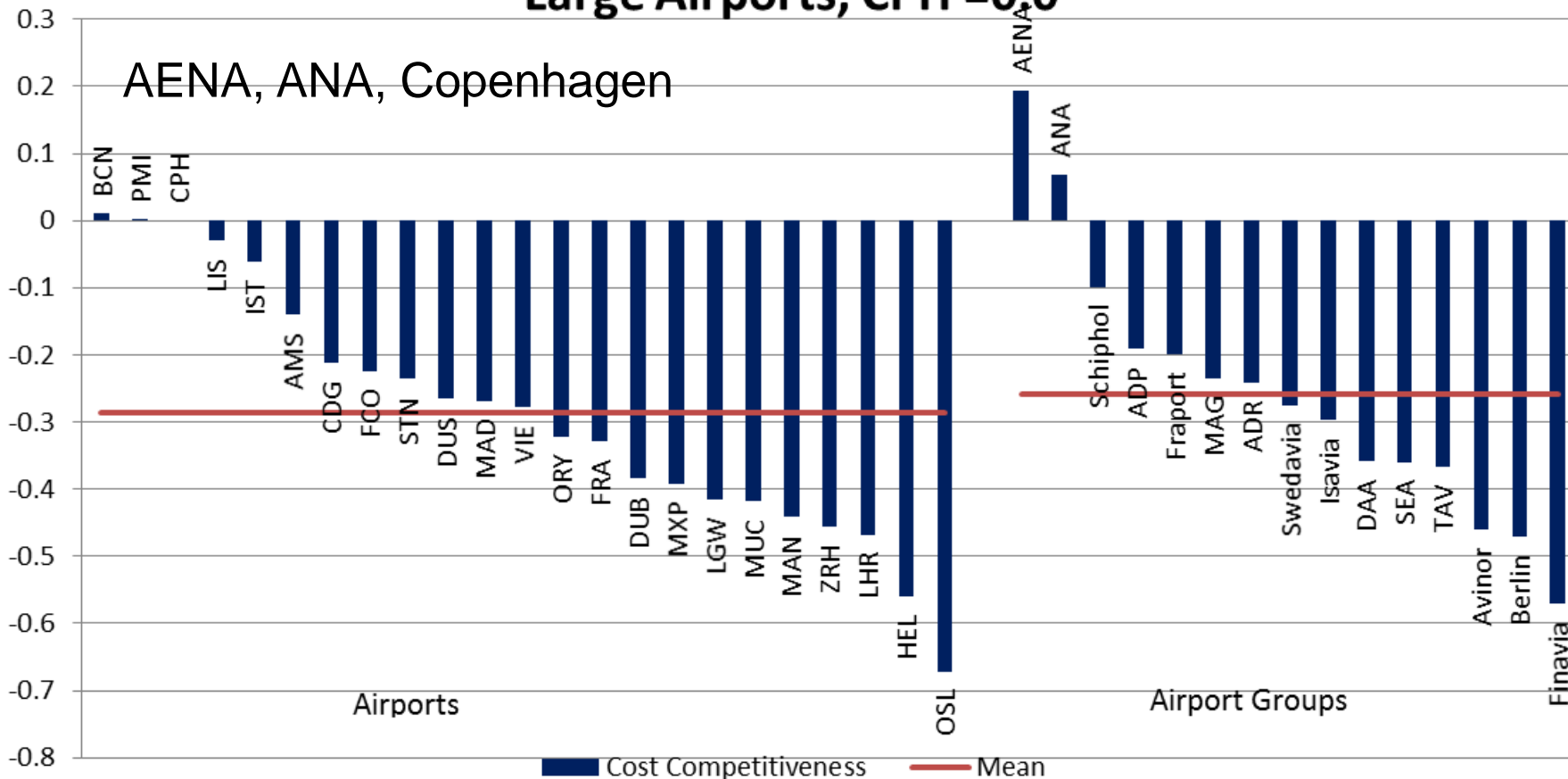Jeju (S. Korea), Haikou (China), Soekarno–Hatta (Indonesia)
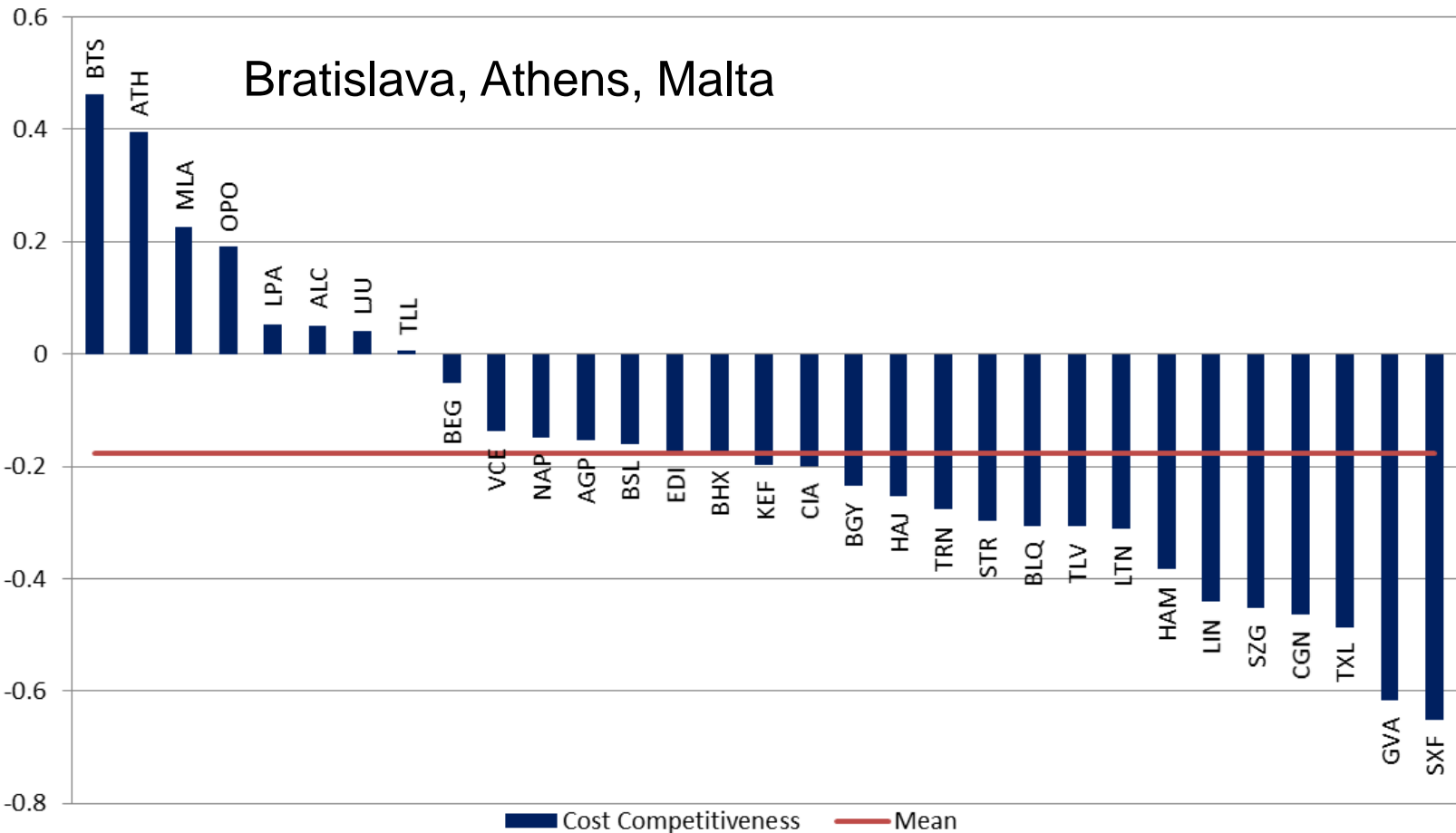
Figure 5.4a2 Cost Competitiveness 2014 - Oceania
SYD=0.0

Queensland Airports Ltd, Sydney, Auckland

Figure 5.4b1 Cost Competitiveness 2014 - Europe
Large Airports, CPH =0,0

AENA, ANA, Copenhagen

Figure 5.4b2 Cost Competitiveness 2014 - Europe Small and Medium Airports, CPH =0.0
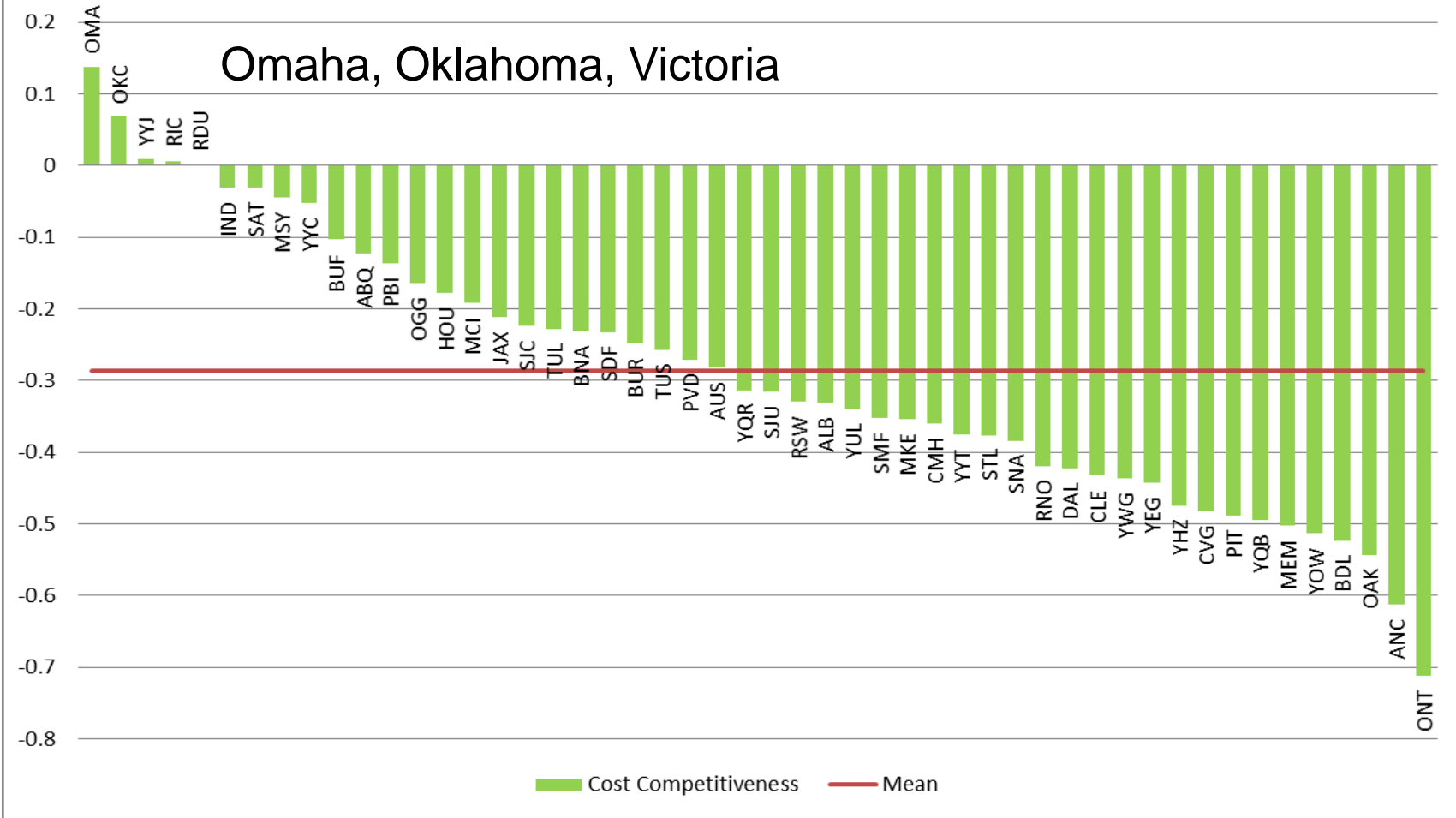
Bratislava, Athens, Malta

Figure 5.4c1 Cost Competitiveness 2014- North America Large Airports, YVR=0.0

Atlanta, Charlotte, Tampa
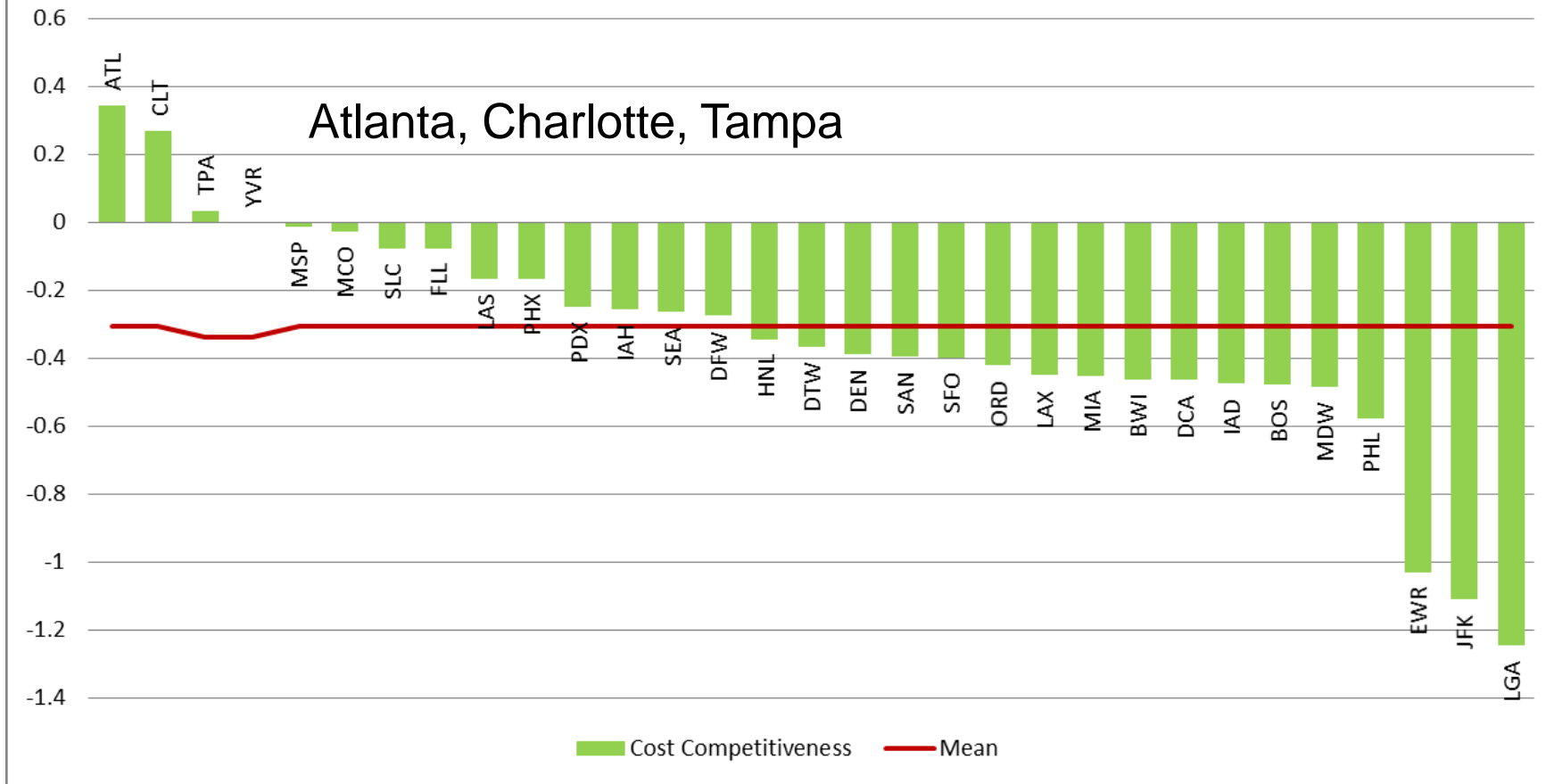
Figure 5.4c2 Cost Competitiveness 2014 - North America
Small and Medium Airports, YVR=0.0

Omaha, Oklahoma, Victoria

Top Cost Competitiveness Performers

Asia-Pacific:

- *Oceania:*
  - **Queensland Airports**, Sydney
- *Asia:*
  - **Jeju,** Haikou

Europe:

- *Large Airports (> 15 million Pax):*
  - **AENA, ANA**, Copenhagen
- *Small/Med Airports (< 15 million Pax):*
  - **Bratislava**, Athens

N. America:

- *Large Airports (> 15 million Pax):*
  - **Atlanta,** Charlotte
- *Small/Med Airports (< 15 million Pax):*
  - **Omaha,** Oklahoma

❑ 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!
Ευχαριστώ!