



Key Results of the 2008 ATRS Global Airport Performance Benchmarking Project

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Outline



- Objective of the Benchmarking Study
- Methodology
- Key Results on Efficiency and Costs
- Airport User Charge Comparisons
- Effects of Business Strategies and Ownership forms
- Conclusions





Objective of the Study

- To provide a comprehensive, unbiased comparison of airport performance, including:
 - Productivity and Efficiency
 - Unit Cost Competitiveness
 - Aviation User Charges Levels





Airports Included in the study

Canada-U.S.	63 airports
Europe	38 airports and 10 airport groups
Asian Airport	24 airports 4 airport groups
Australia and NZ	9 airports

Total	134 airports and 14 airport groups
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*****Need your help in order to include more airports; Can you help us with the data?**



Data Sources: 2001-06

(2007 data for airport user charges)

- Airport's Annual Reports, Financial Statements, 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
 - 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





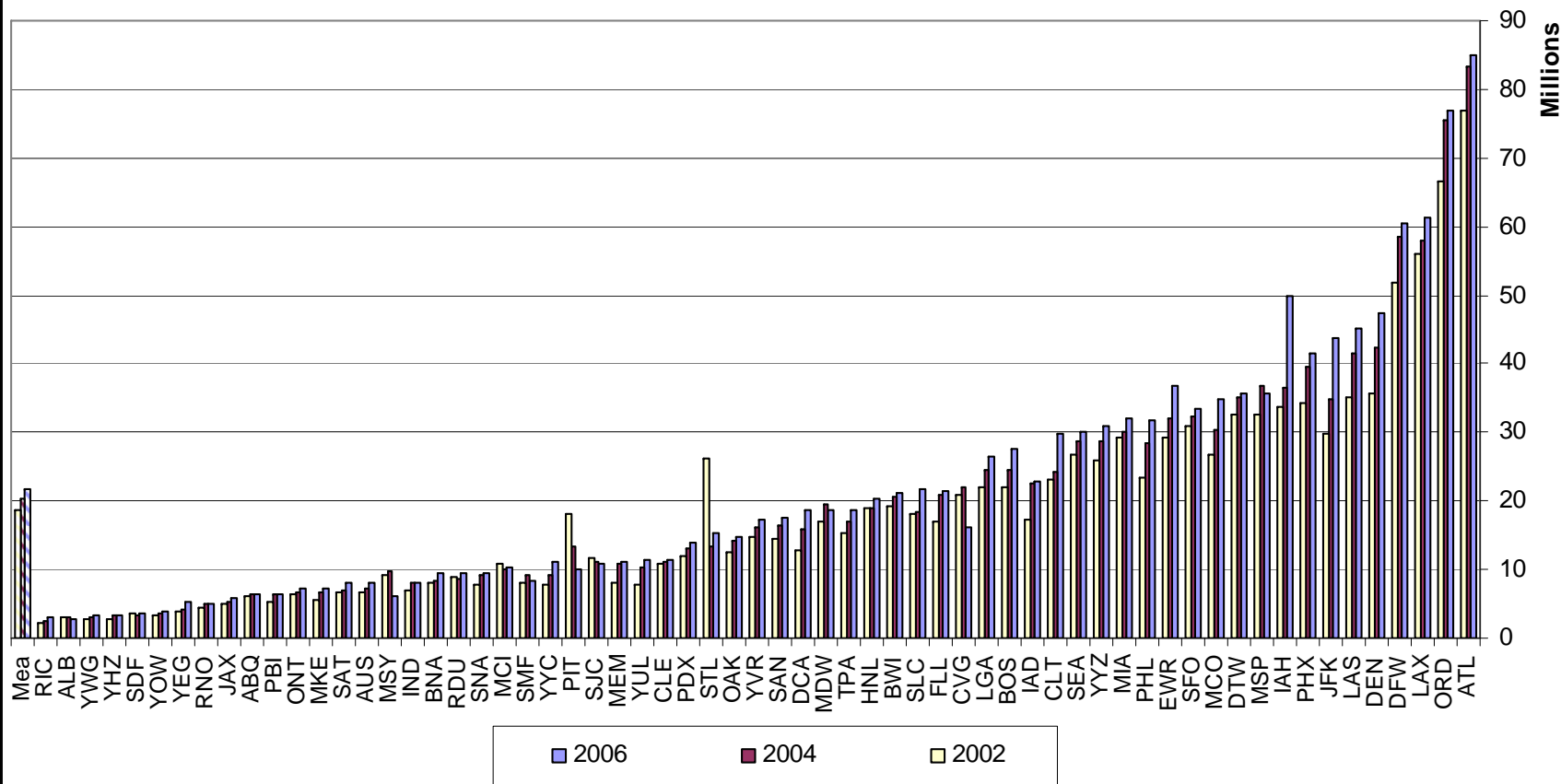
Characteristics of Sample Airports





Passenger Traffic - North American

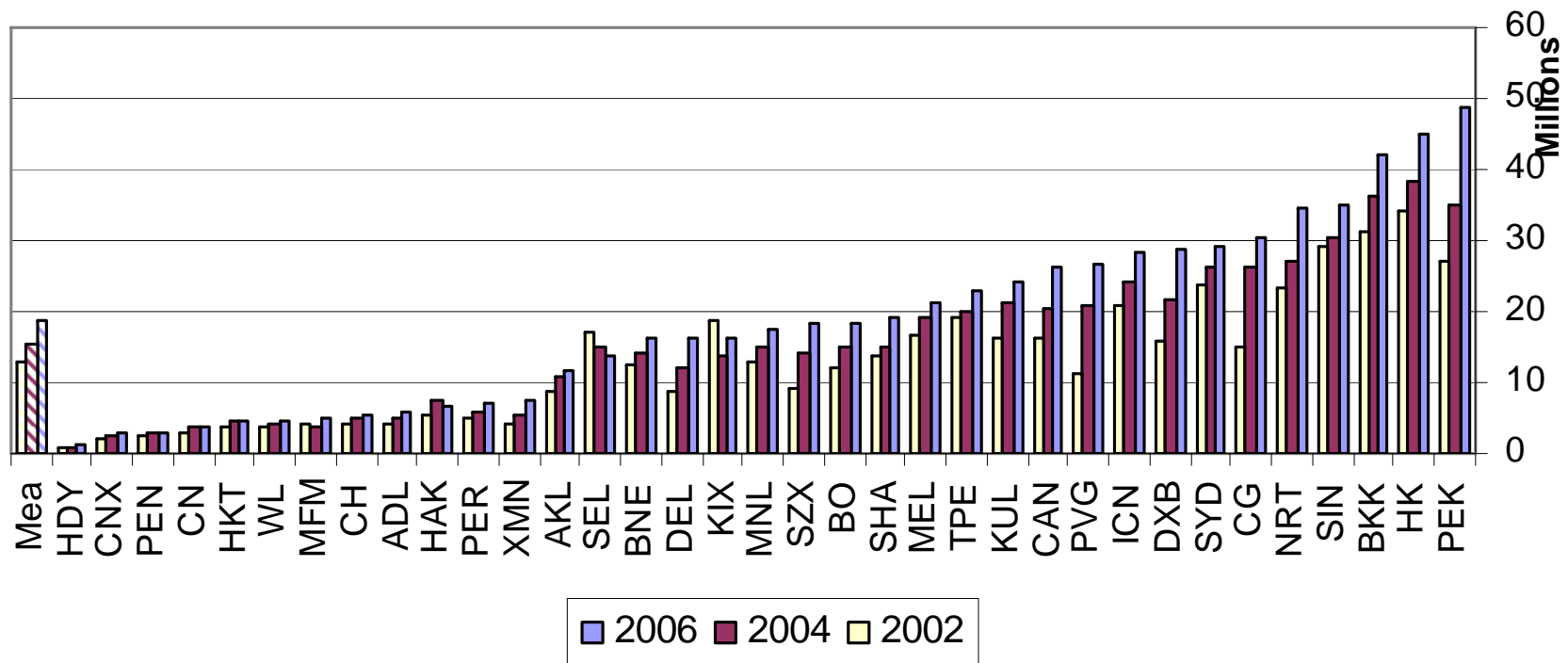
Figure 3.4.1a: Passenger Traffic (2002/04/06)
North America





Passenger Traffic –Asia Pacific

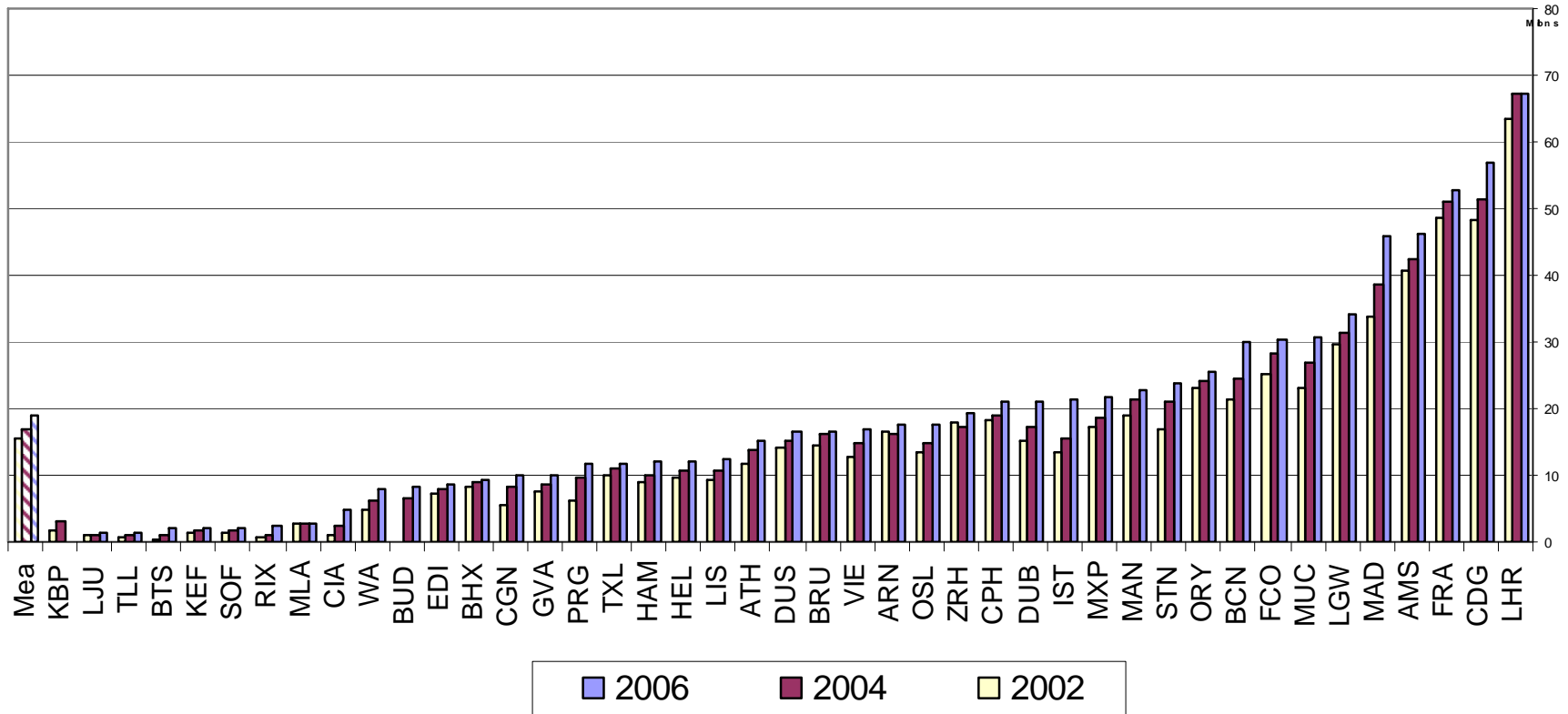
3.4.1c: Passenger Traffic (2002/04/06) - Asia Pacific



Passenger Traffic - Europe

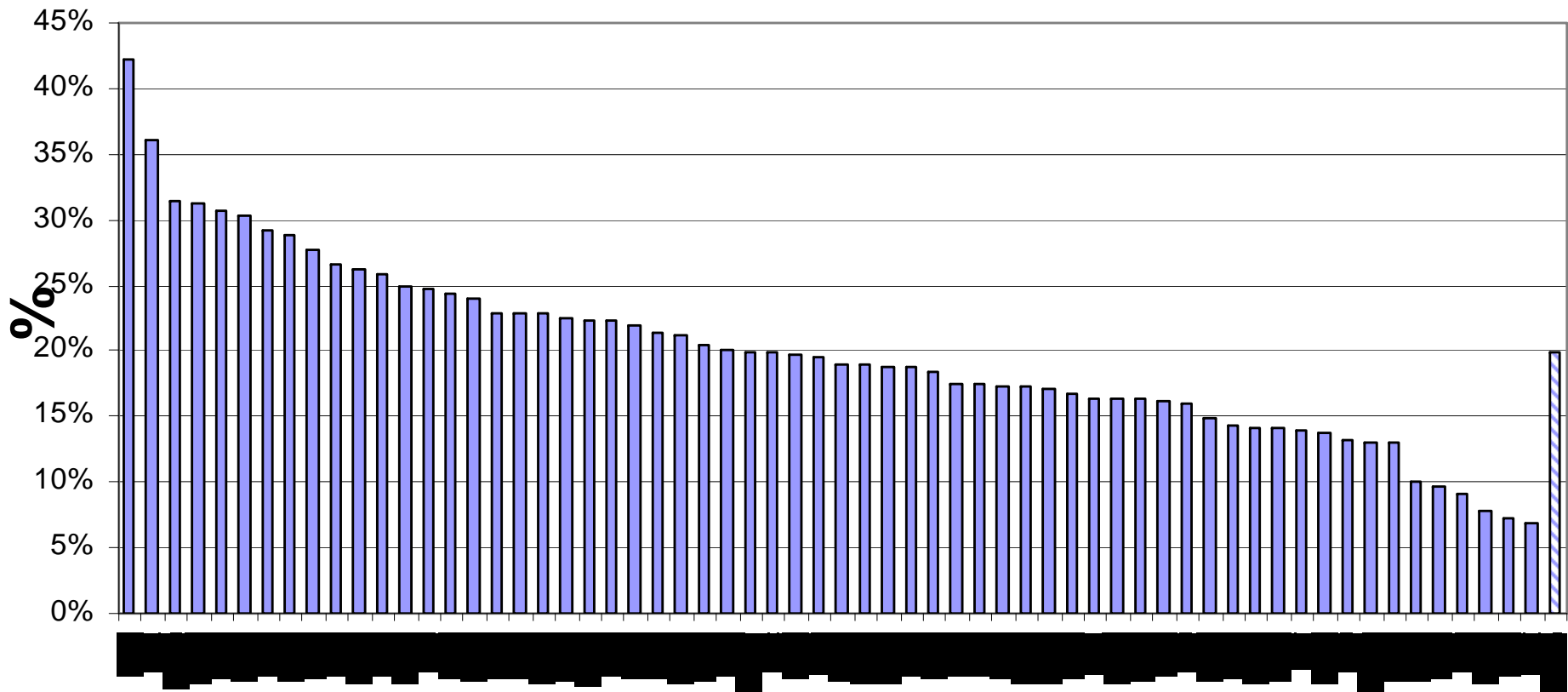


Figure 3.4.1b: Passenger Traffic (2002/04/06) - Europe



Concession Revenue Shares – N. America

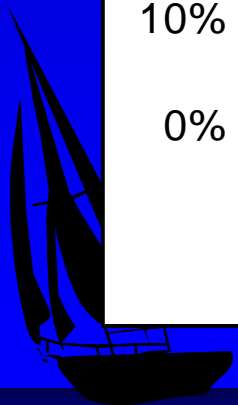
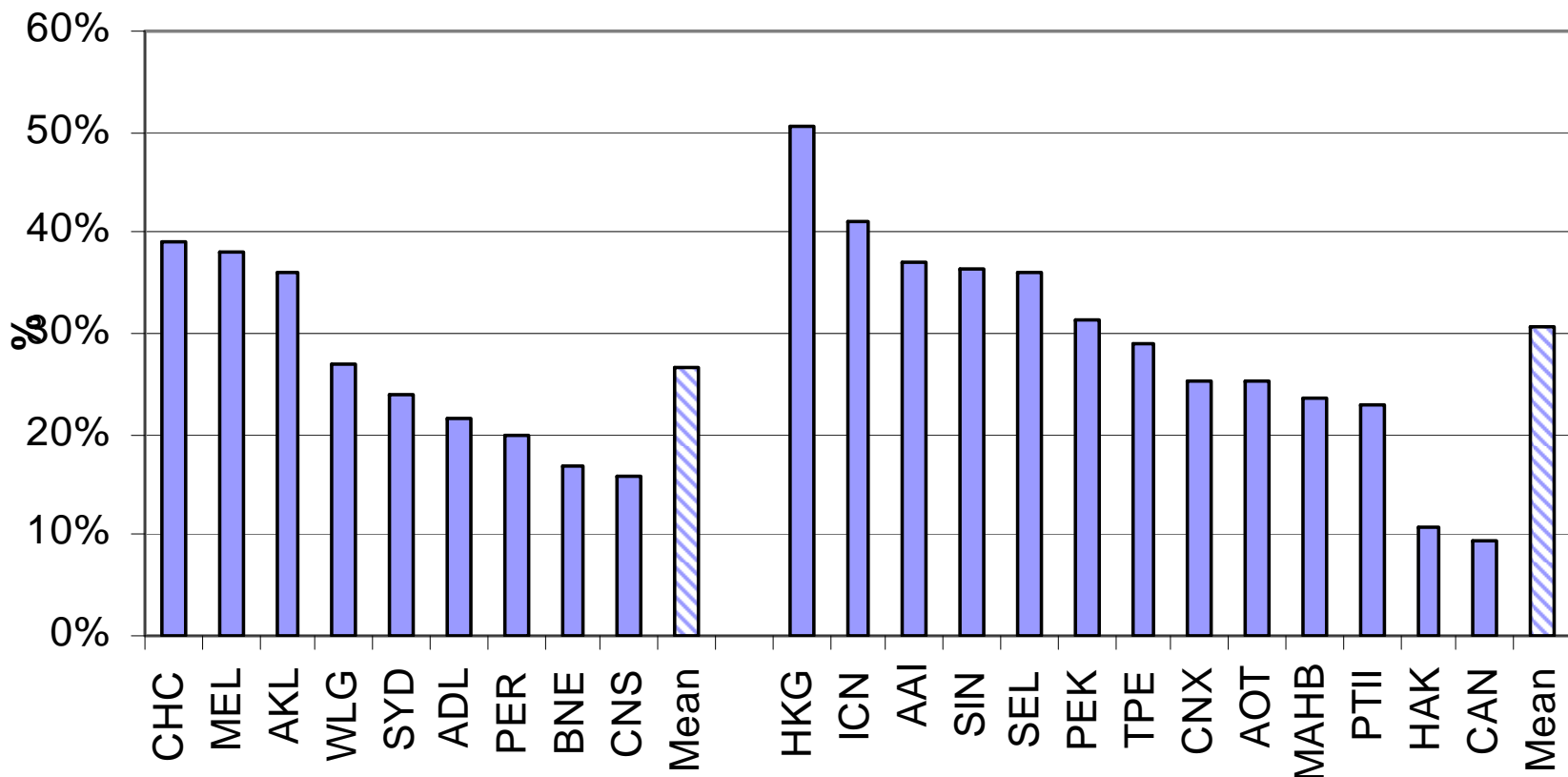
Concession Revenue Shares - North America (2006)



Concession Revenue Shares – Asia-Pacific



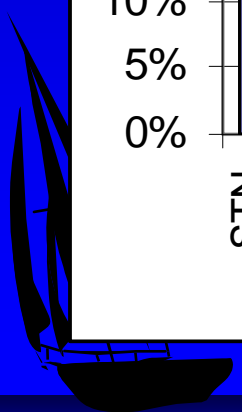
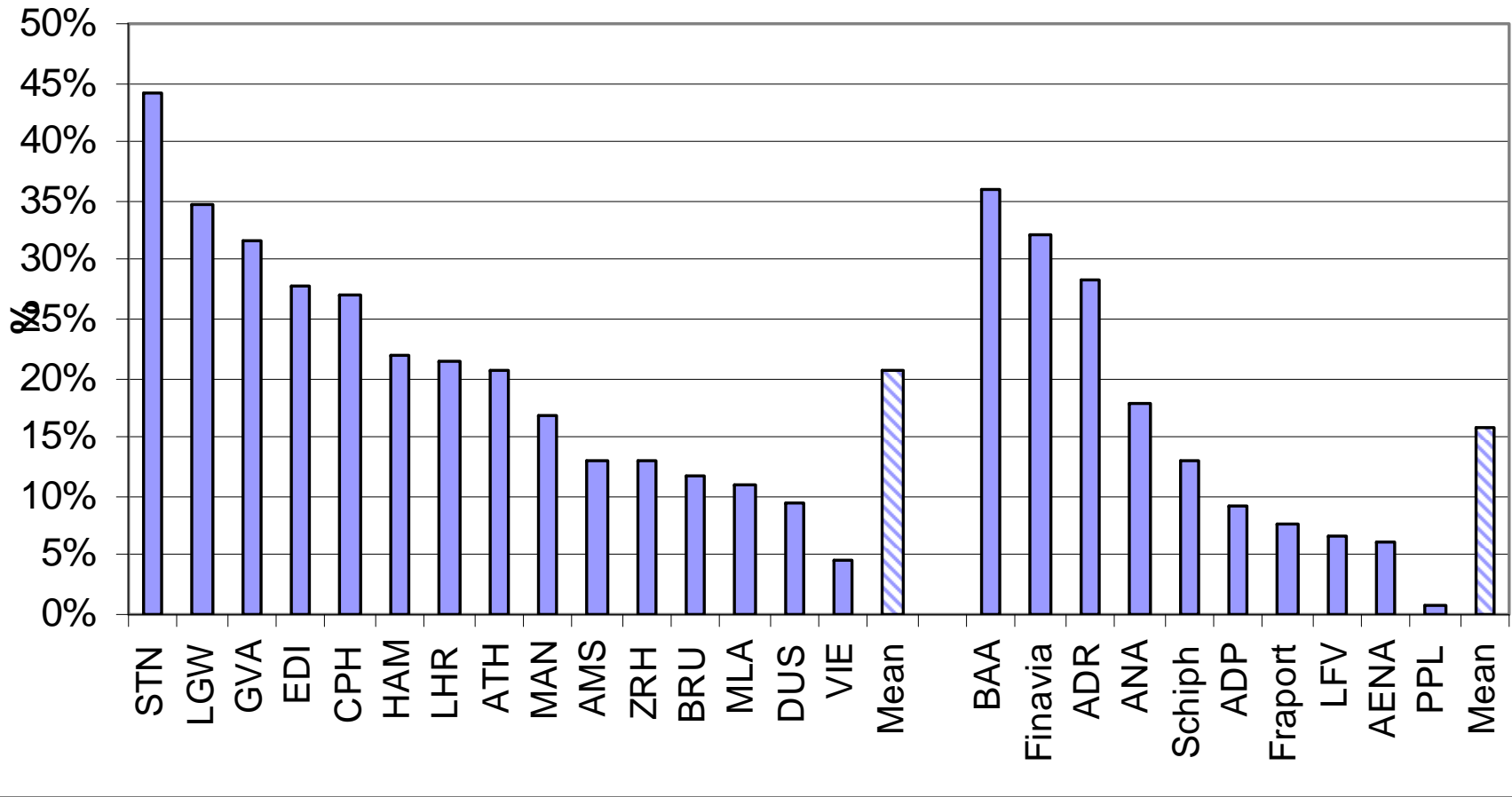
Concession Revenue Shares - Asia Pacific (2006)



Concession Revenue Shares – Europe



Concession Revenue Share - Europe (2006)



Methodology: EFFICIENCY



MEASUREMENT

INDEX NUMBER APPROACH:

- **Need to go beyond Partial Factor Productivity (PFP) such as labor productivity**
 - ⇒ **Variable Factor Productivity (VFP)**
 - ⇒ Total Factor Productivity (TFP: capital input accounting problem)
 - ⇒ **Unit Cost Competitiveness Index = Combines VFP and Input Price Index**
- **Complementary approaches we are exploring:**
 - **Data Envelopment Analysis (DEA)**
 - **Econometric Cost Function Approach including Stochastic Frontier Cost Function**





Airport Productivity Index

Outputs	Inputs
<ul style="list-style-type: none">• Aircraft movement• Passengers• (Cargo)• Other revenues including concessions	<ul style="list-style-type: none">• Labour• Other non-capital (soft cost) inputs• Runways• Terminals• Gates



Potential Reasons for the Measured Productivity (gross VFP) Differentials

Factors Beyond Managerial Control:

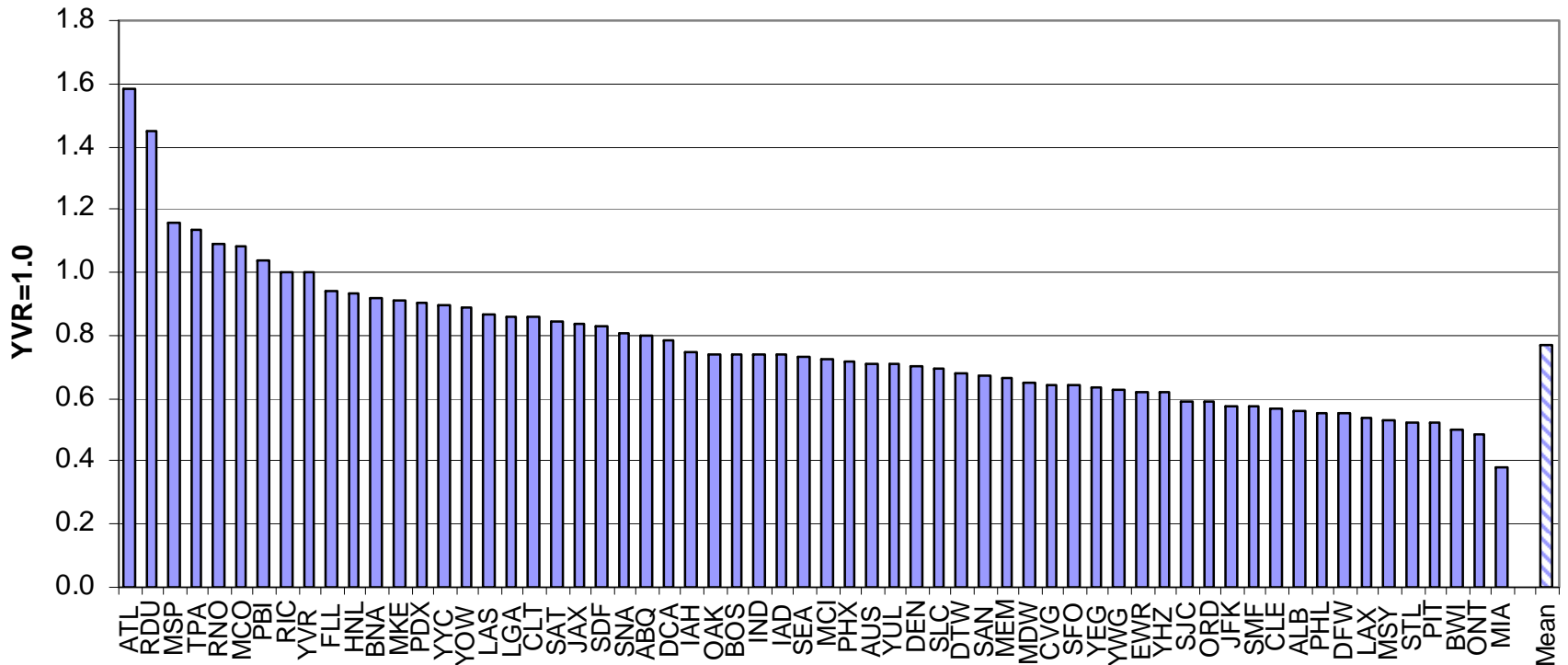
- Airport size (Scale of aggregate output)
- Average aircraft size using the airport
- Share of international traffic
- Share of air cargo traffic
- Extent of capacity shortage - congestion delay
- Connecting/transfer ratio

We compute ‘residual (net)’ productivity measures after removing effects of these Factors



Residual (Net) Variable Factor Productivity: Overall Efficiency Measure – North America

Figure S-4a, Residual Variable Factor Productivity (2006), North America
YVR = 1.0

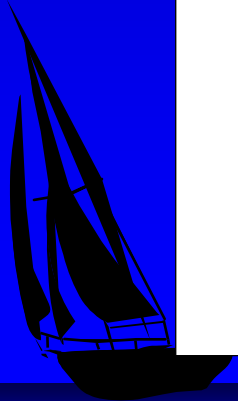
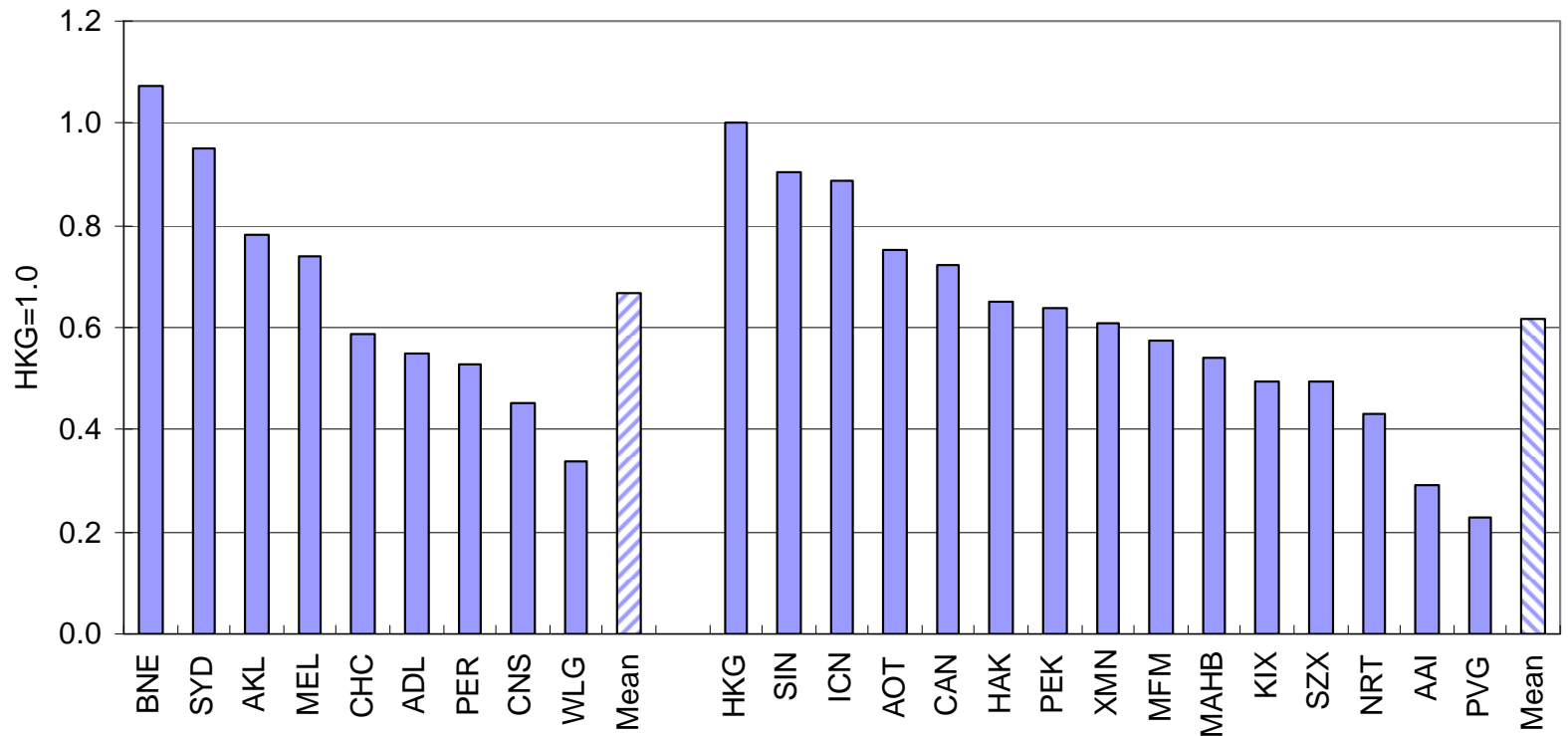


YYZ asked us not to include it in efficiency analysis.



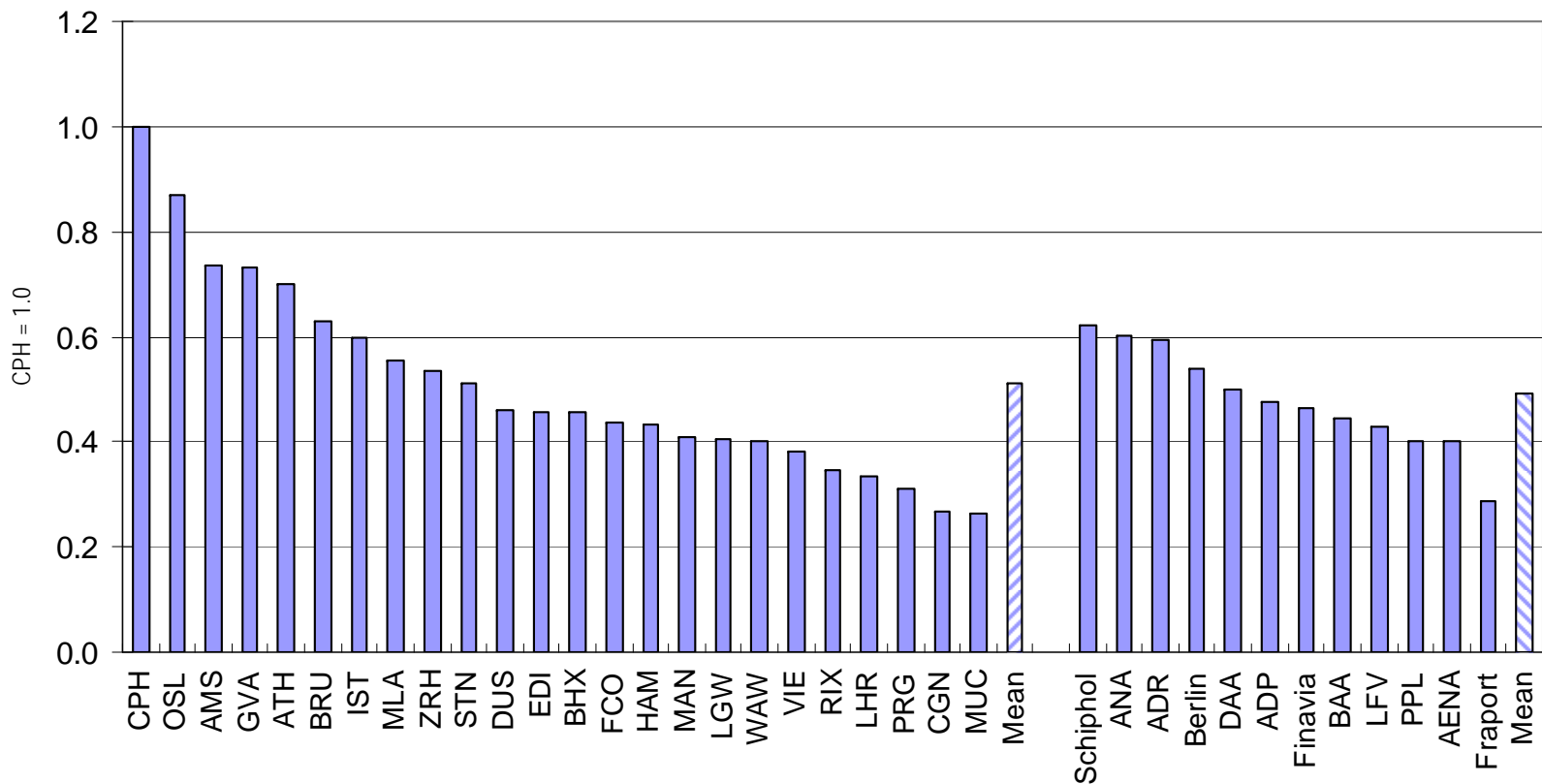
Residual (Net) Variable Factor Productivity: Overall Efficiency Measure – Asia Pacific

Figure S-4c Residual Variable Factor Productivity (2006) - Asia Pacific
HKG=1.0



Residual (Net) Variable Factor Productivity: Overall Efficiency Measure – Europe

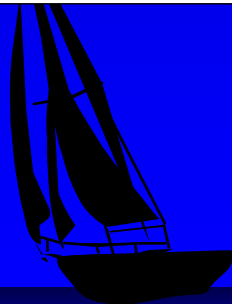
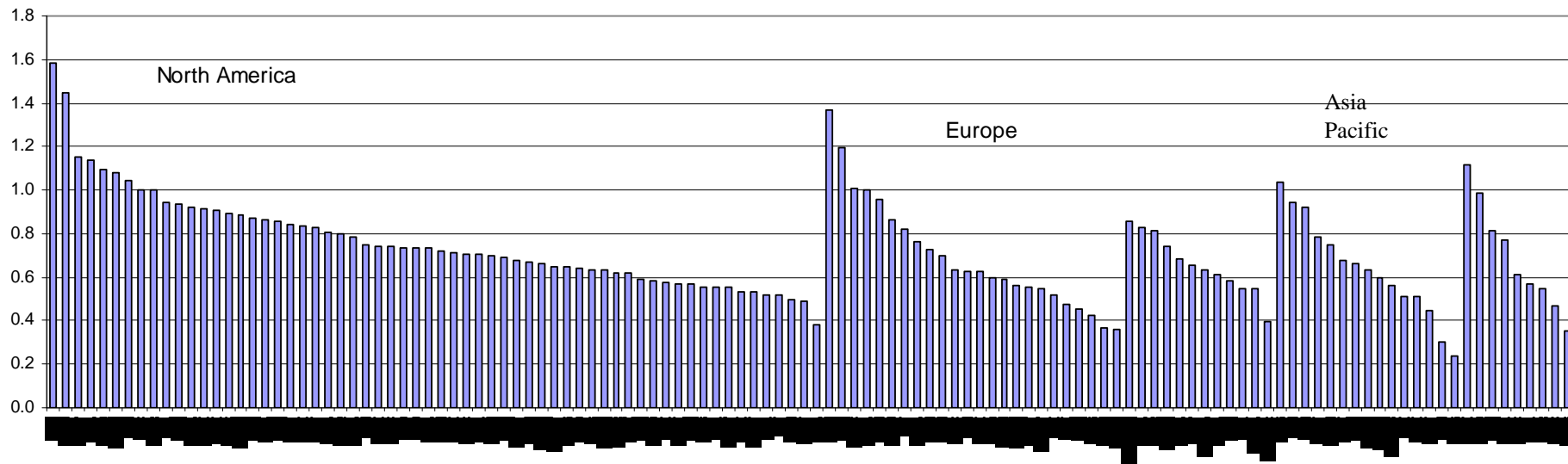
Figure S-4b Residual Variable Factor Productivity (2006)- Europe
CPH=1.0





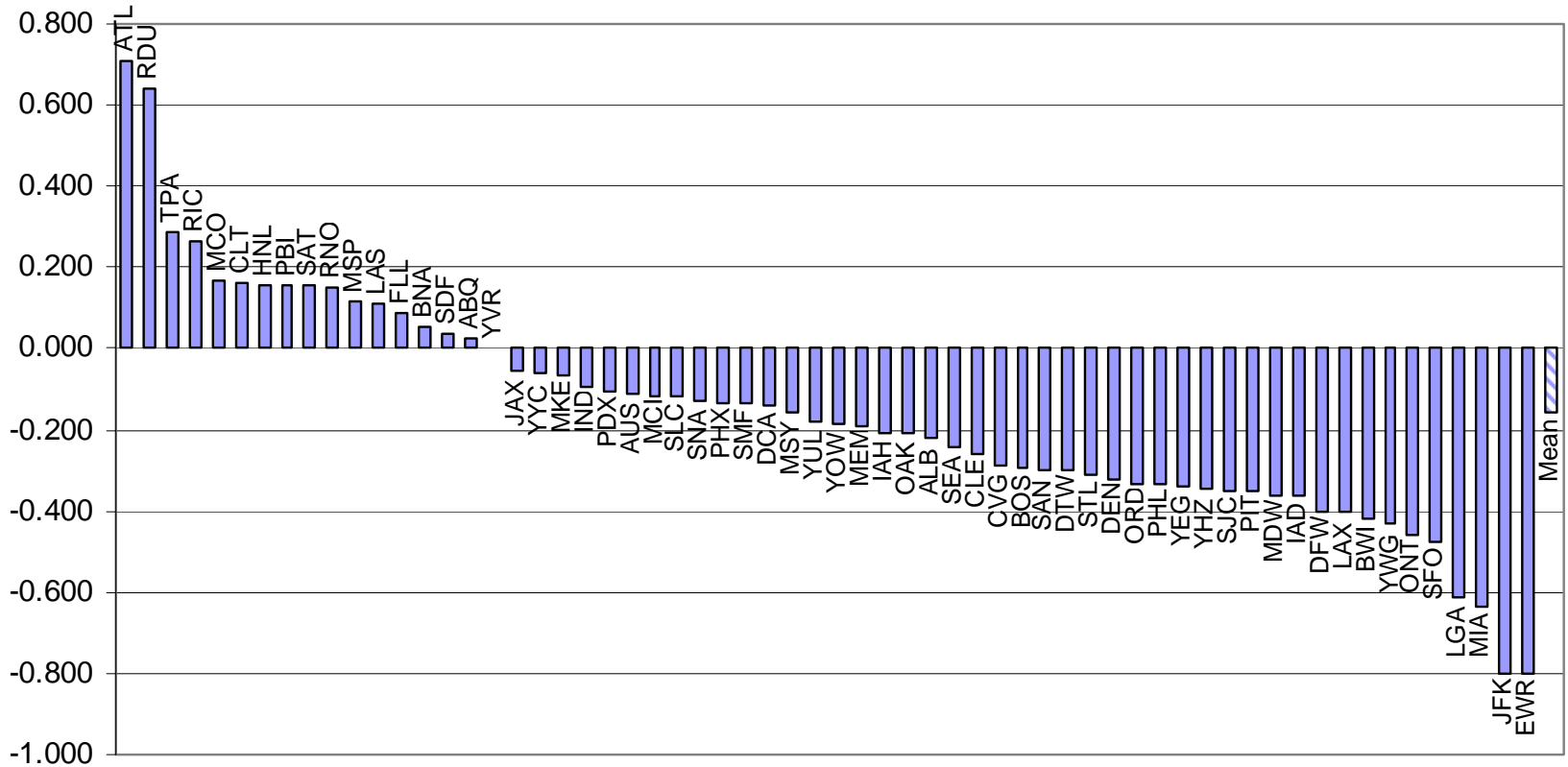
Global Comparison – Net VFP

Figure S-4, Residual Variable Factor Productivity (2006)



Cost Competitiveness – North America (= net VFP + input price effect)

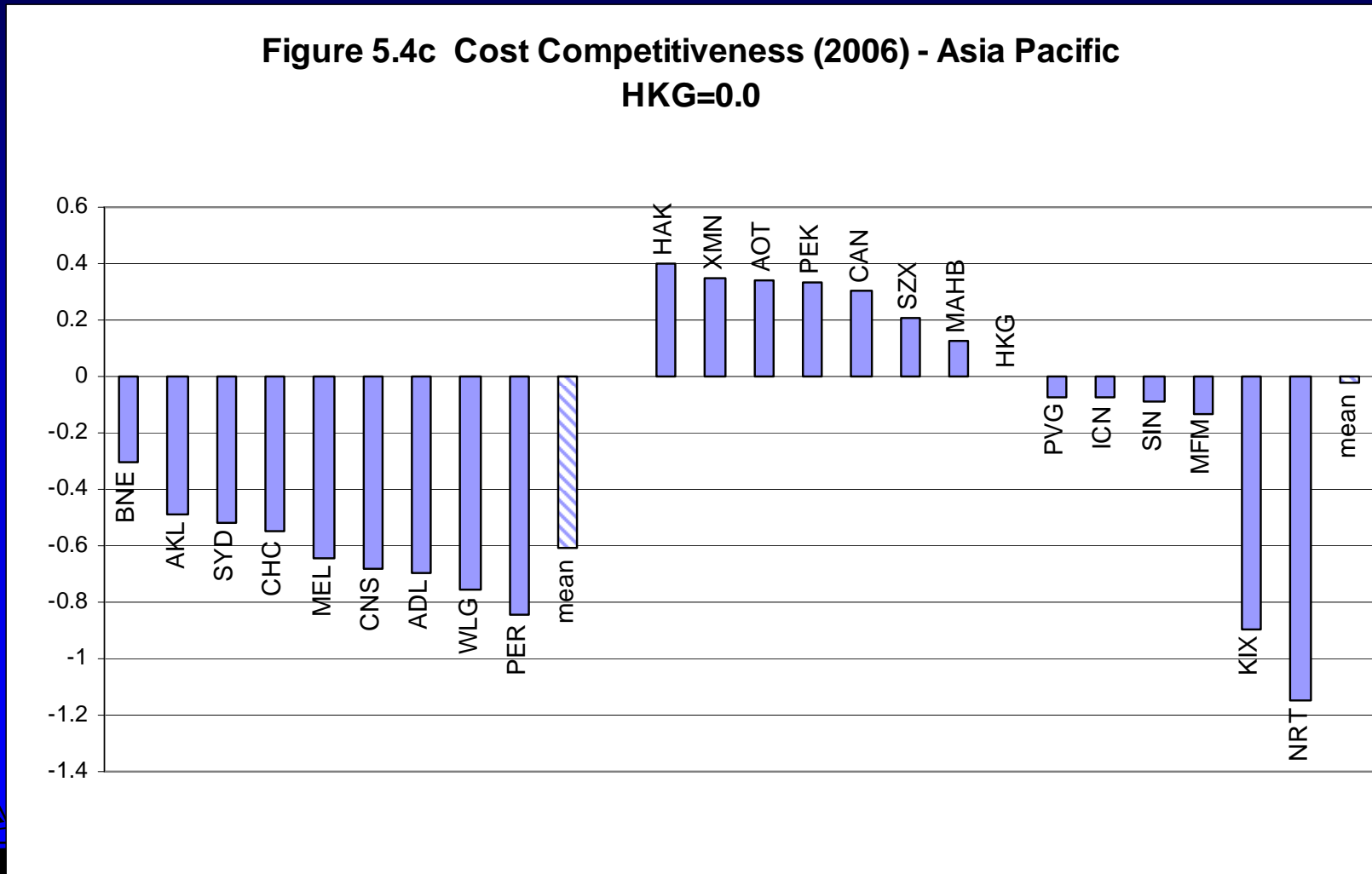
Figure 5.4a Cost Competitiveness 2006 - North America
 YVR=0.0



YYZ asked not to be included in the analysis.

Cost Competitiveness—Asia Pacific

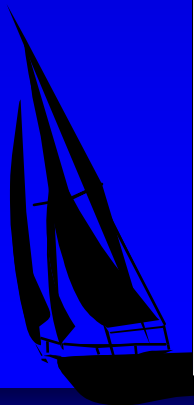
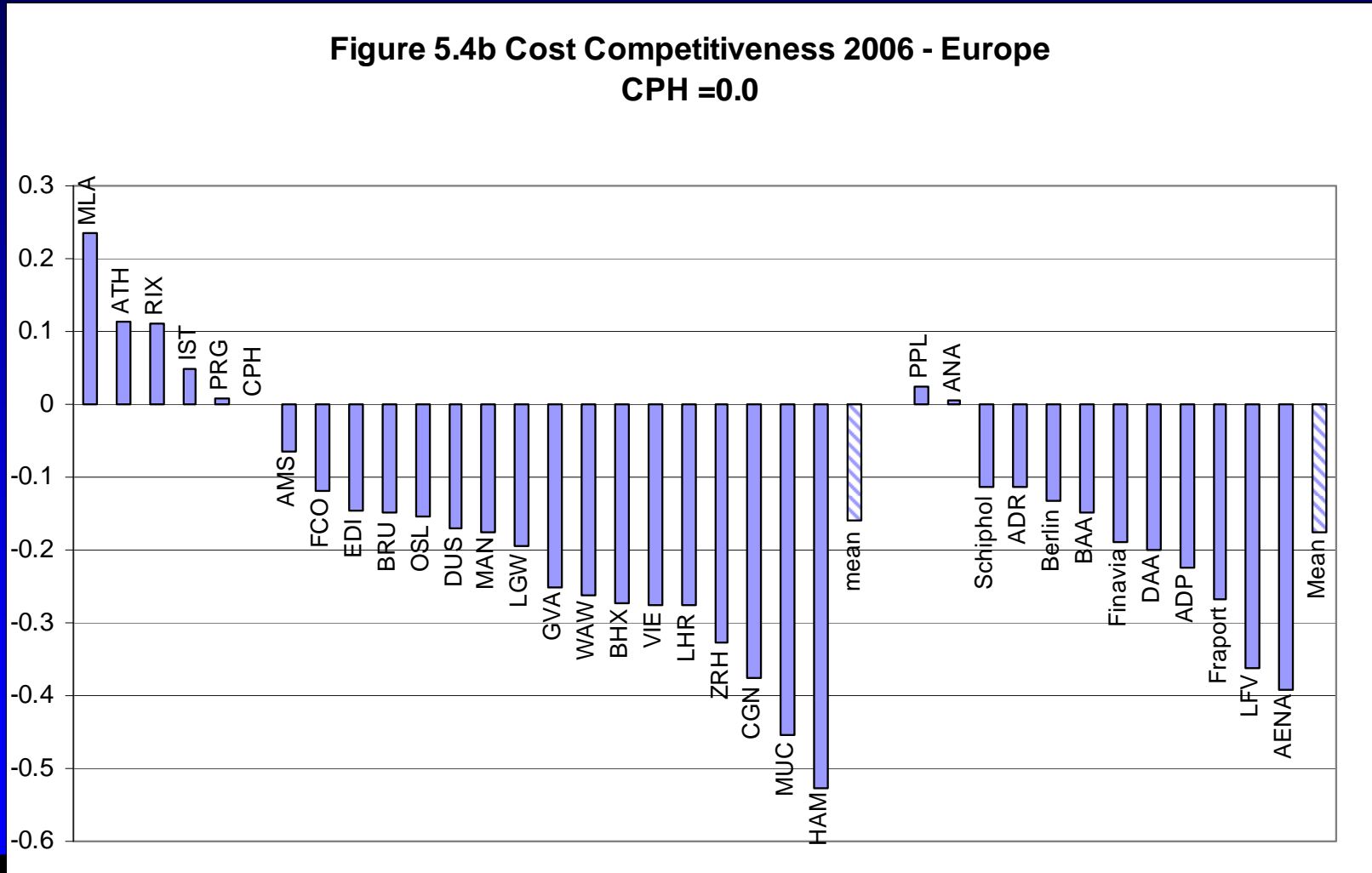
(= Net VFP plus Input Price (how low input prices are))





Cost Competitiveness – Europe

(= Net VFP plus Input Price (how low input prices are))



Top Performers



Top Operating Efficiency Performers based on Net VFP (Labor + Soft cost inputs only):

- Canada/US: **Atlanta**, Raleigh-Durham, Minneapolis
- Europe: **Copenhagen**, **Oslo**, Amsterdam
- Asia-Pacific: **Hong Kong**, Singapore, Seoul-Incheon
- Oceania: Brisbane, Sydney, Auckland

Top Performers Based on Unit Cost Competitiveness Index

- Canada/US: **Atlanta**, Tampa, Raleigh-Durham,
- Europe: **Riga**, Athens, Malta, Istanbul
- Asia: **Haikou**, Xiamen, AOT
- Oceania: **Brisbane**, Auckland



Outline

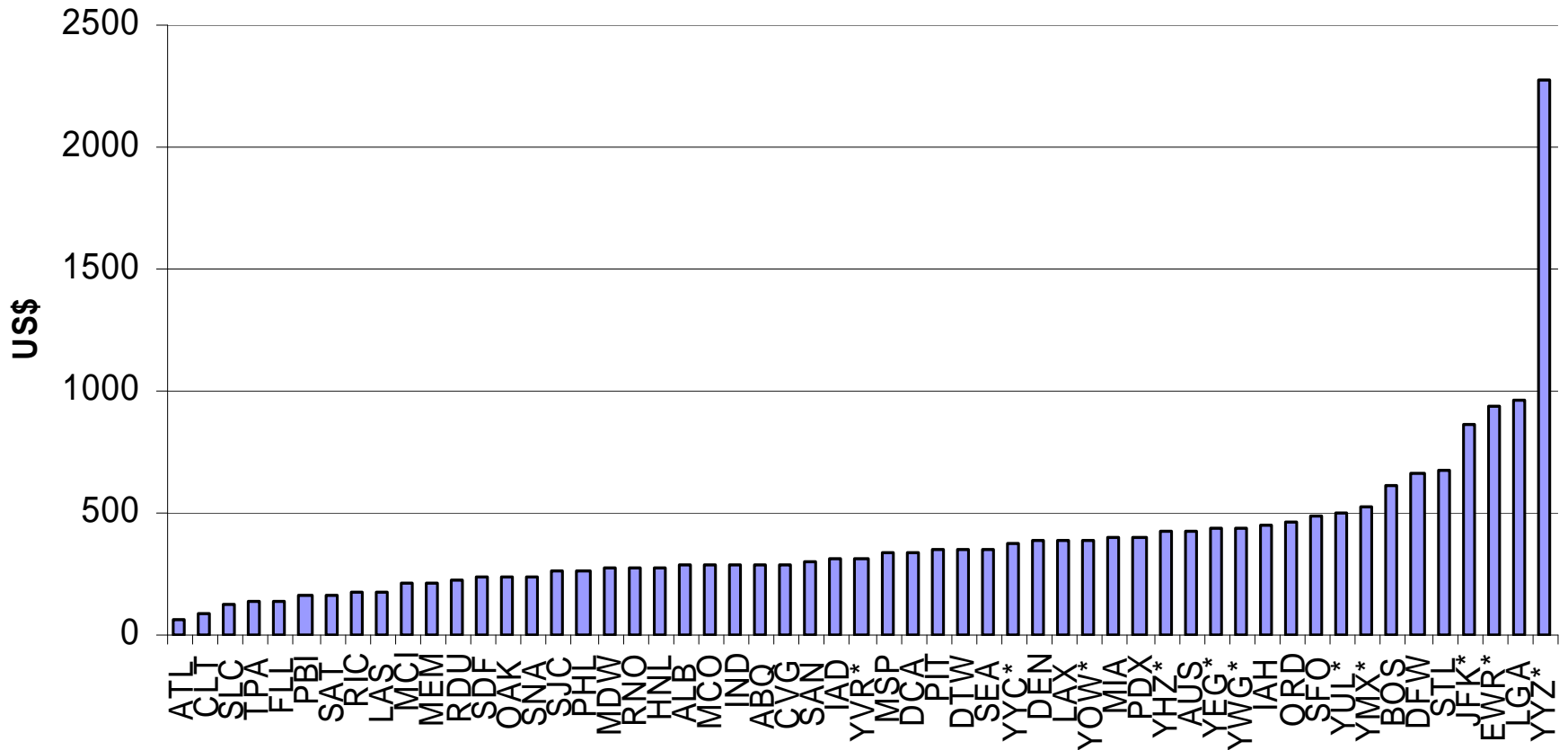


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- **2007-Airport User Charges Comparison**
- Conclusions





Figure S-8b Landing Charges for Airbus 320, 2007
North America





**Figure S-8b Landing Charges for Airbus 320, 2007
Asia Pacific**

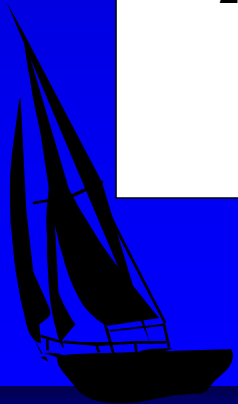
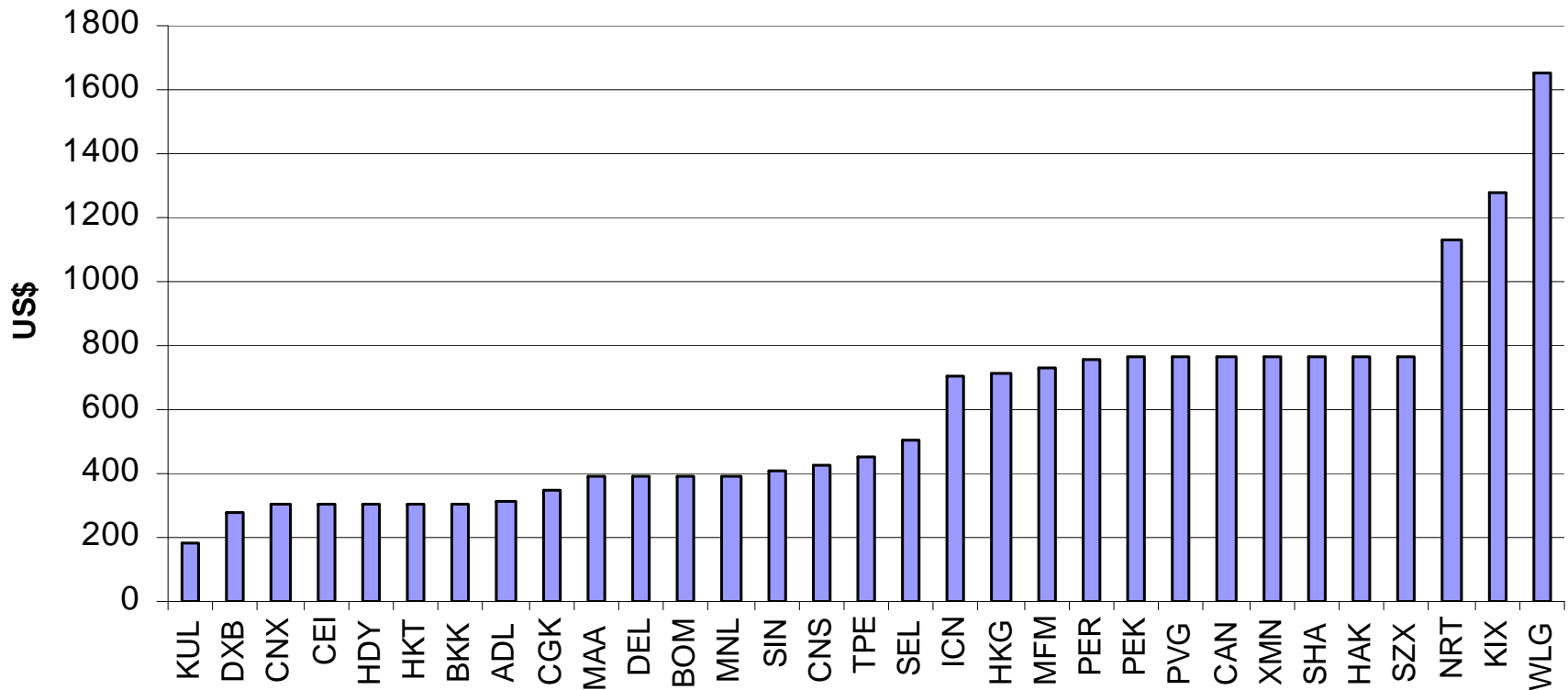
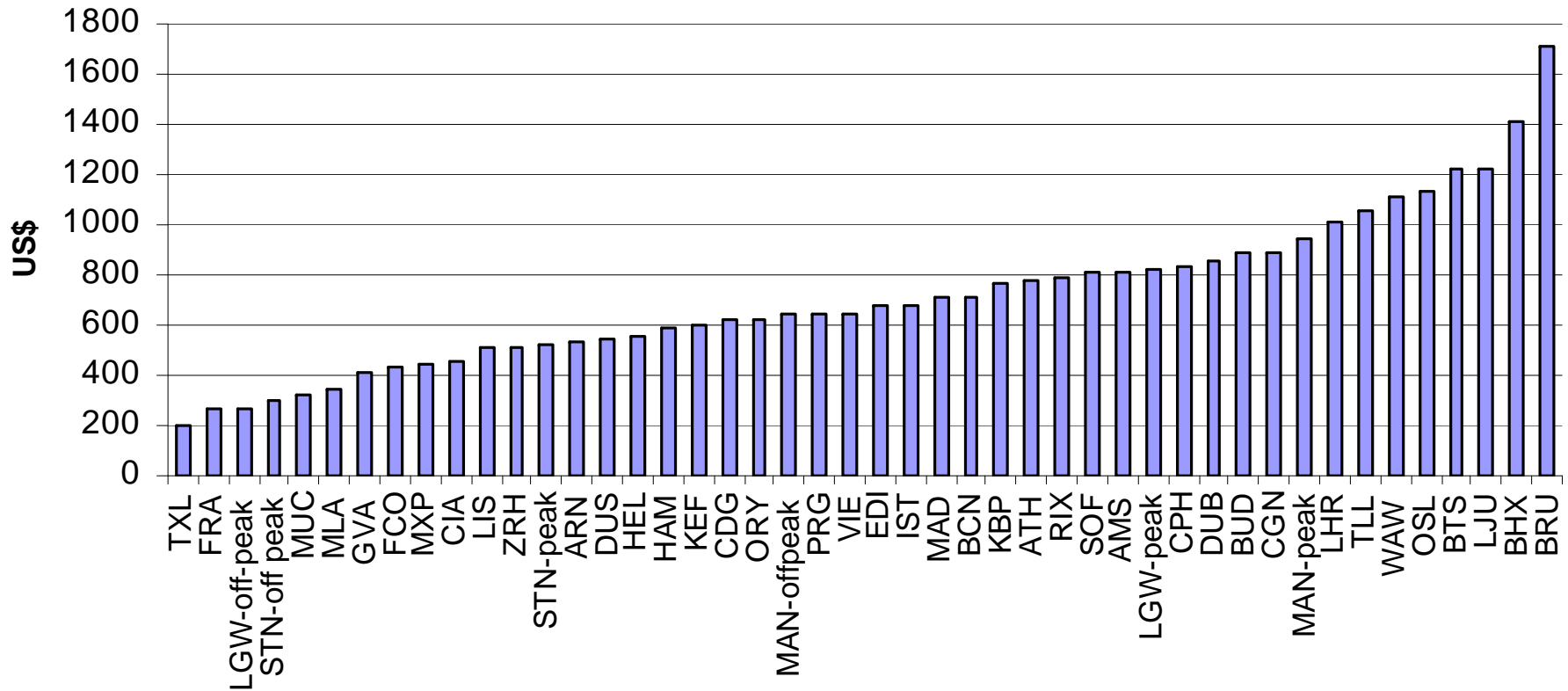




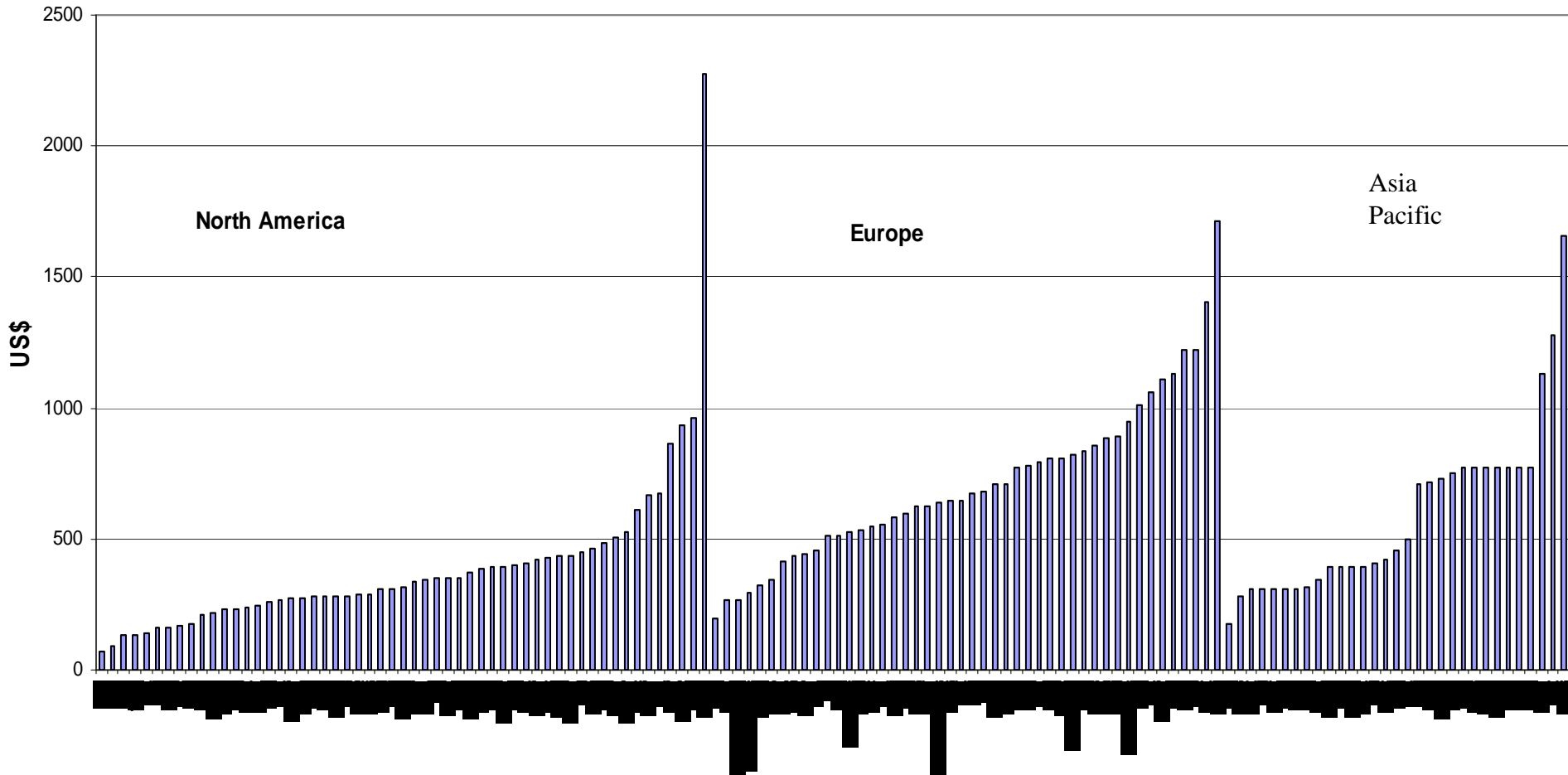
Figure S-8b Landing Charges for Airbus 320, 2007
Europe



2007: A320 Landing Fees – Global Comparison



Figure S-8b Landing Charges for Airbus 320, 2007





**Figure S-8a Landing Charges for Boeing 747, 2007
North America**

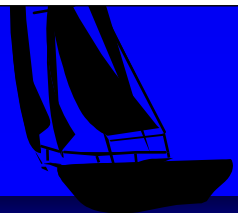
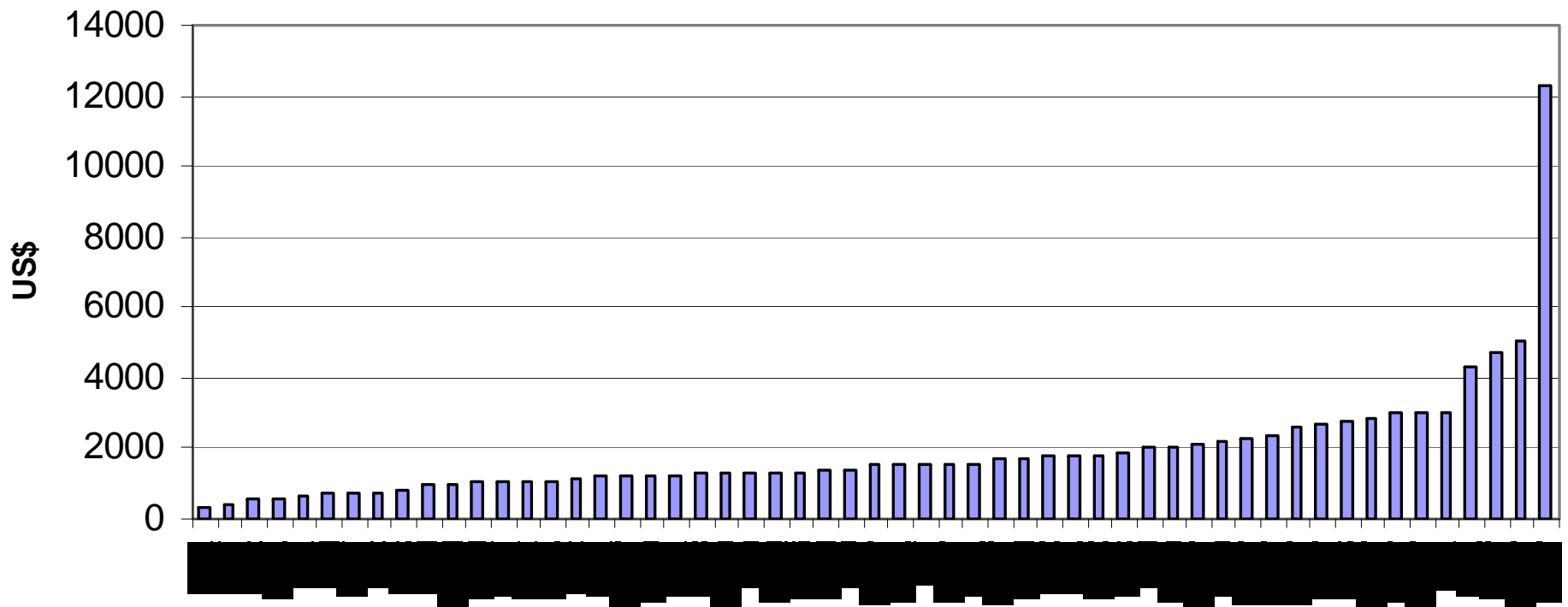
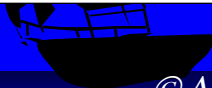
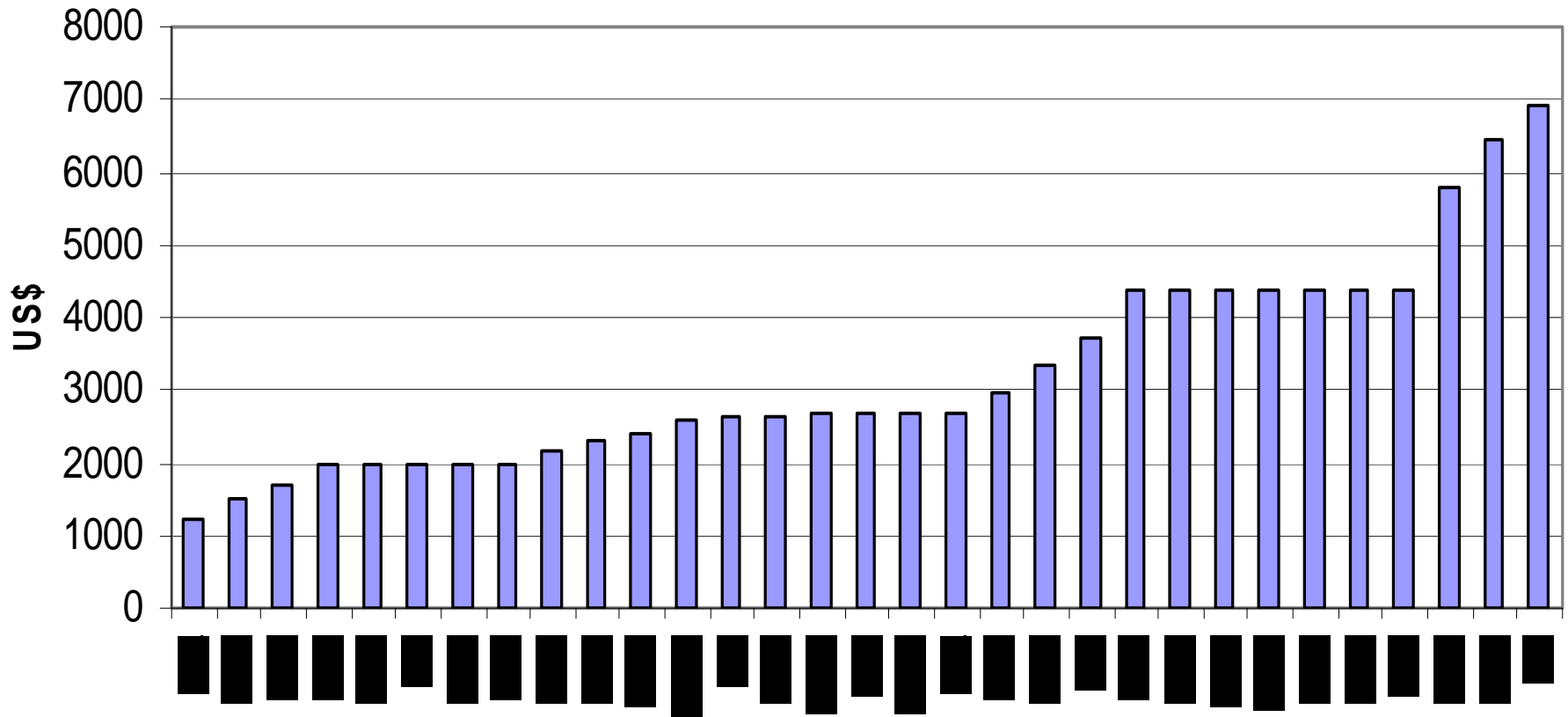


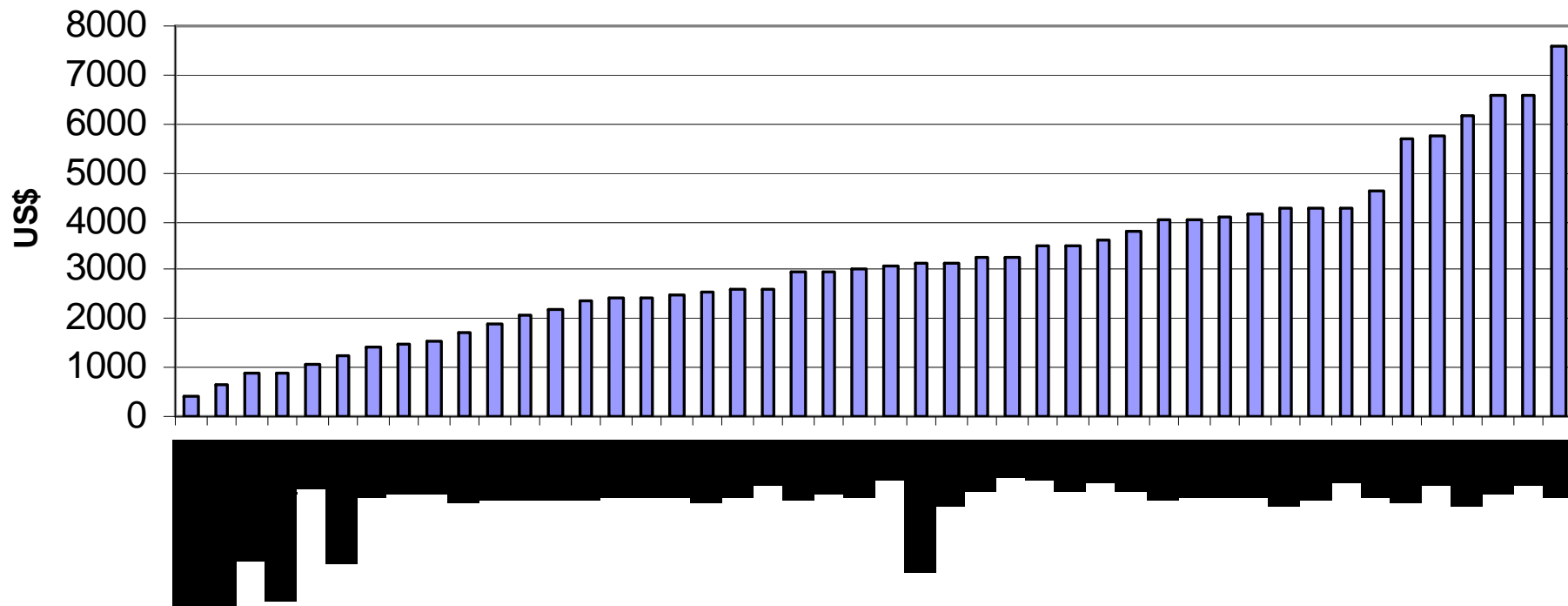


Figure S-8a Landing Charges for Boeing 747, 2007
Asia Pacific



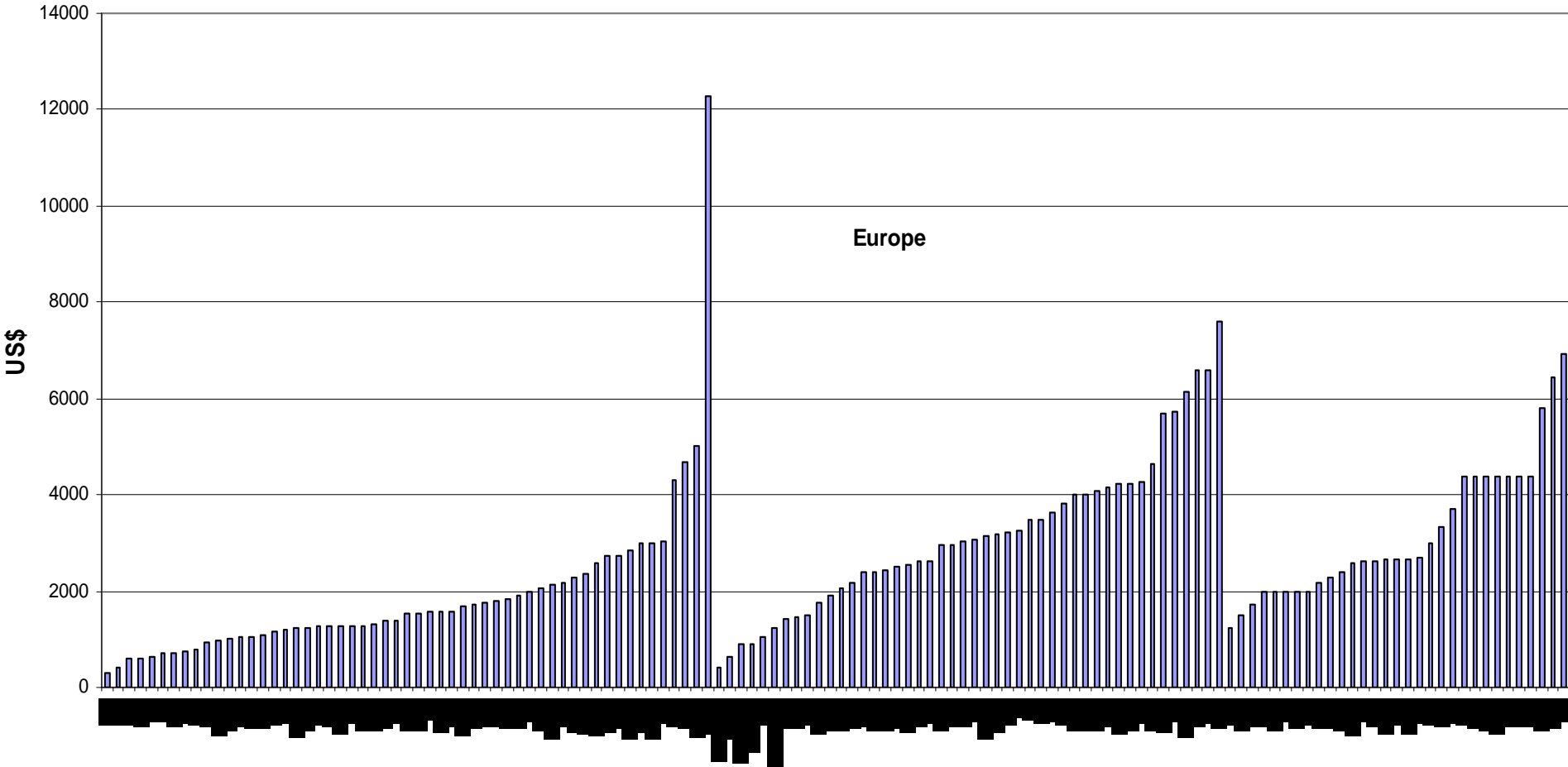


**Figure S-8a Landing Charges for Boeing 747, 2007
Europe**



Global Comparison: 2007 B747 Landing fee

Figure S-8a Landing Charges for Boeing 747, 2007





Summary – Landing/Takeoff Charges

- **Global Results:** Airports charging highest aircraft movement charges:
 - Boeing 747: **Toronto**, Kansai, Birmingham
 - Airbus 320: **Toronto**, Brussels, Wellington

- **North American Results** (both B747 and A320):
 - Highest charges: **Toronto**, LaGuardia, Newark, JFK
 - Lowest aircraft movement charges: **Atlanta, Charlotte, Tampa, Salt Lake City**





Summary – Landing Charges (cont'd)

➤ **Asia-Pacific Results:**

- **Highest charges for B747:** Kansai, Narita, major Chinese airports, Incheon;
- **Highest charges for A320:** Kansai, Narita, Wellington, Major Chinese airports
- **Lowest charges:** Kuala Lumpur, Thailand airports; Dubai; Adelaide, Jakarta Soekarno-Hatta, Singapore





Summary – Landing Charges (cont'd)

➤ **European Results:**

- **Highest charges for B747:** Birmingham; Ljubljana, Bratislava, Tallinn, Warsaw
- **Highest charges for A320:** Brussels, Ljubljana, Bratislava, Warsaw

- **Lowest charge for B747:** Gatwick-offpeak; Manchester-offpeak; Stansted; Berlin Tegal;
- **Lowest charges for A320:** Berlin Tegal, Frankfurt, Gatwick-offpeak, Stansted Off Peak,



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- **Effects of Business Strategies and Ownership Forms**



Results on Business Strategies



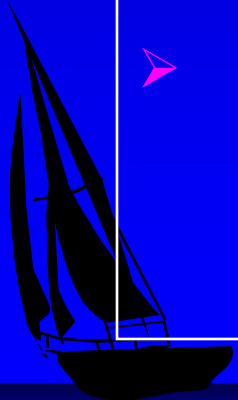
- *Diversification of Revenue Source is good:*
 - Airports with larger share of non-aeronautical revenue achieves higher Net VFP (efficiency)
- *Outsourcing:*
 - Airports who contract out their terminal operations to outside operator achieve higher efficiency
 - *Outsourcing entire terminal operations to expert firms improve efficiency*



Empirical Results on Ownership Forms



- **Majority private sector ownership is best**
- **PPP with with a government majority is worse than even 100% government owned arm length corporation.**
- **On Average, Independent Airport Authority are better performer than City Owned Airports**
- **U.S. airports operated by port authorities are worst efficiency performers.**
- **Cities with multiple airports (e.g. New York): Privatization of one or more airports would improve the efficiency of all airports**

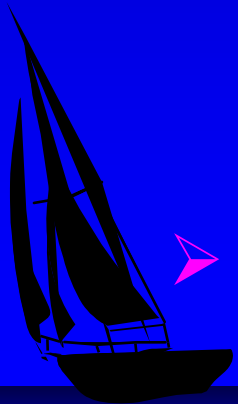




Please Note

- The ATRS Global Airport Performance **Benchmarking Report** : 3 volumes, over 400 pages with valuable data and analysis
Can be purchased by visiting

www.atrsworld.org





Thank You

