Key Results of the 2009 ATRS Global Airport Performance Benchmarking Project

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www.atrsworld.org

The ATRS Global Airport Benchmarking Task Force

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Outline

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

Objective of the Study

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

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Airports Included in the study

Canada-U.S.	**63 airports**
Europe	**43 airports and**
	12 airport groups
Asia	**27 airports**
	4 airport groups
Australia and NZ	**9 airports**
Total	**142 airports and**
	16 airport groups

*****Need your help in order to include more airports; Can you help us with the data?**

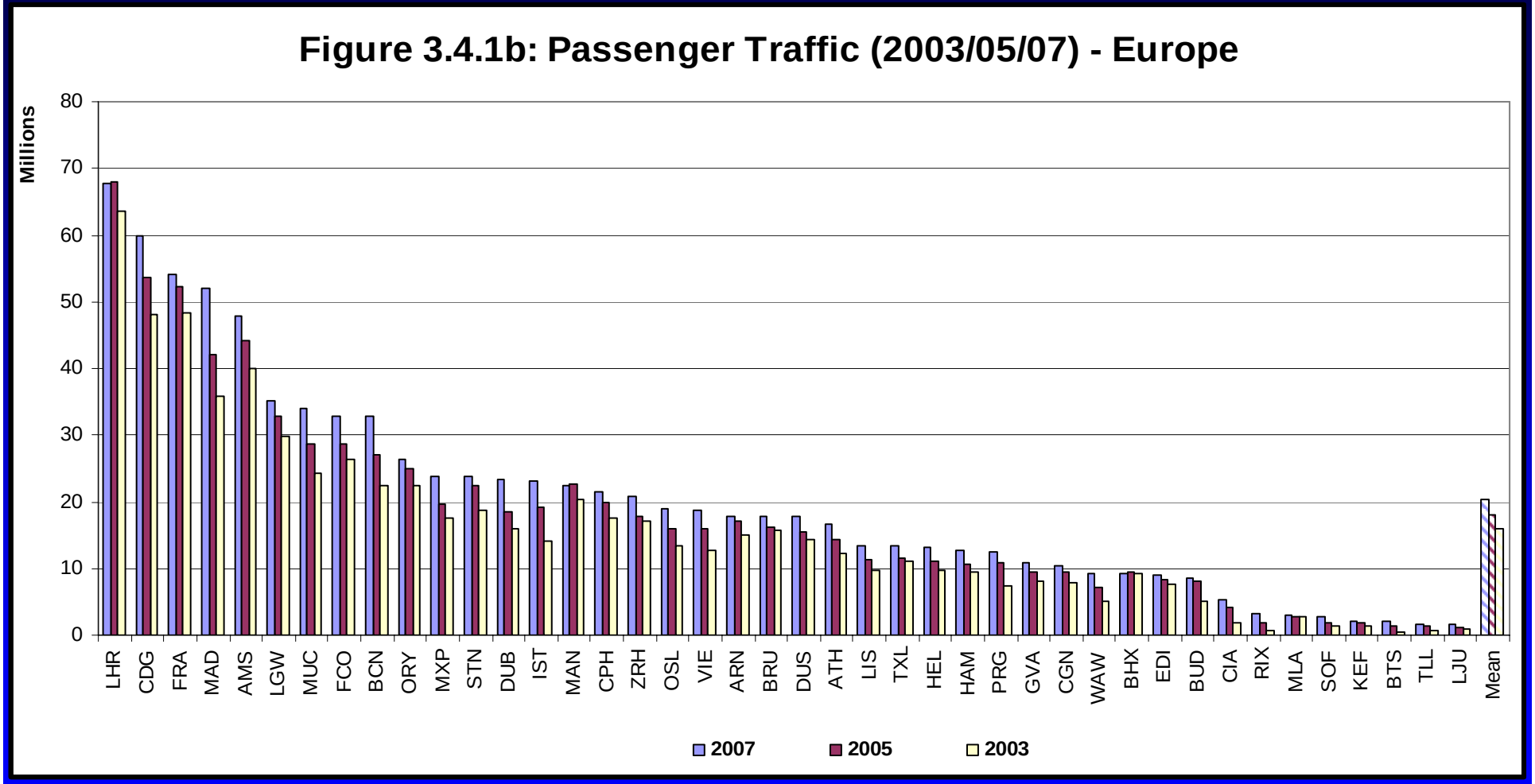
Data Sources: 2001-07

(2008 data for airport user charges)

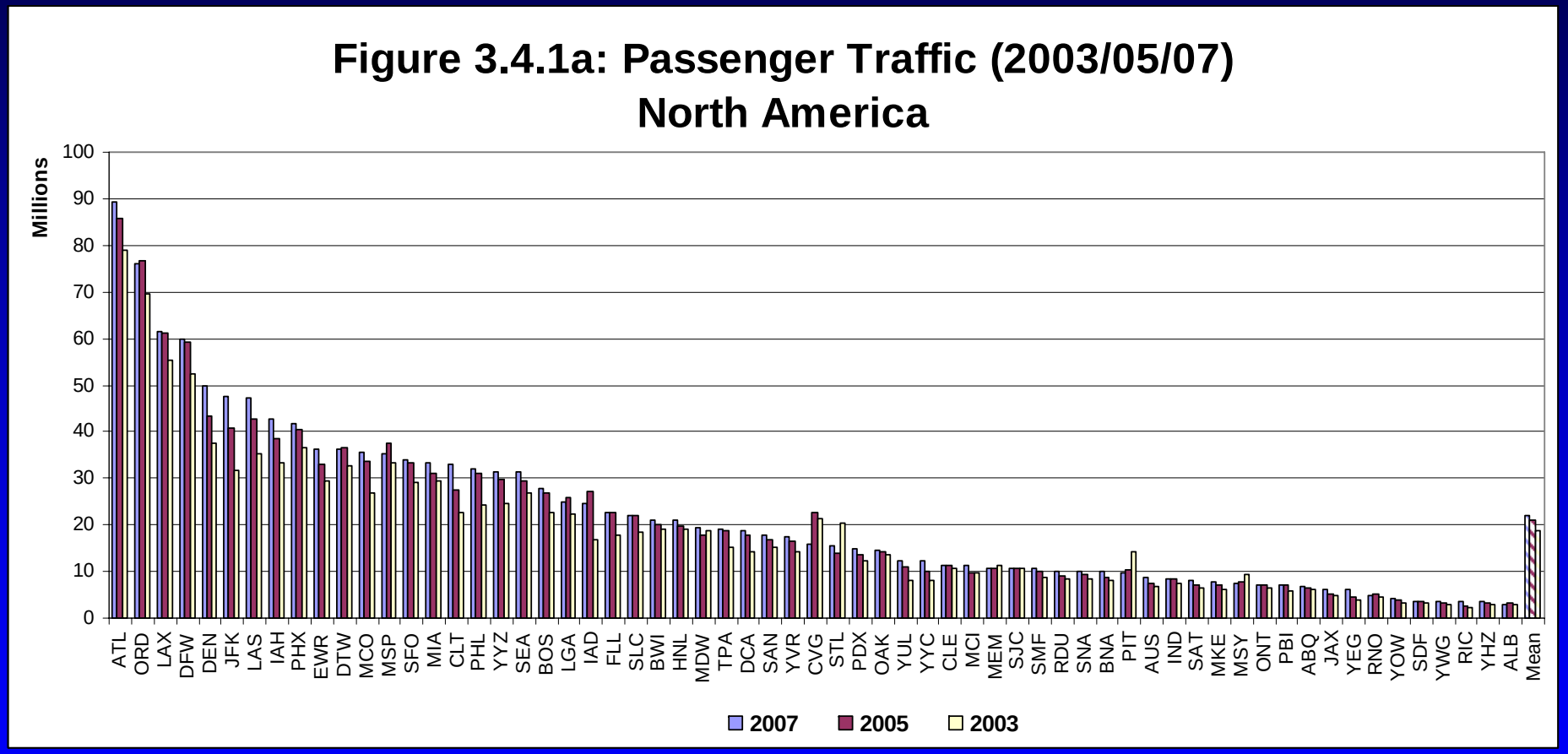
- Airport's Annual Reports, Financial Statements, and direct data requests;
- US FAA, DOT statistics;
- Association of European Airlines (AEA) Statistics
- ICAO Digest of Statistics:
  - annual and monthly traffic data
  - annual financial data -- not for all airports
- ACI; IATA
  - annual traffic statistics; 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
- US Census Bureau, Statistics Canada – regionally based **Cost of Living Index**

Characteristics of Sample Airports

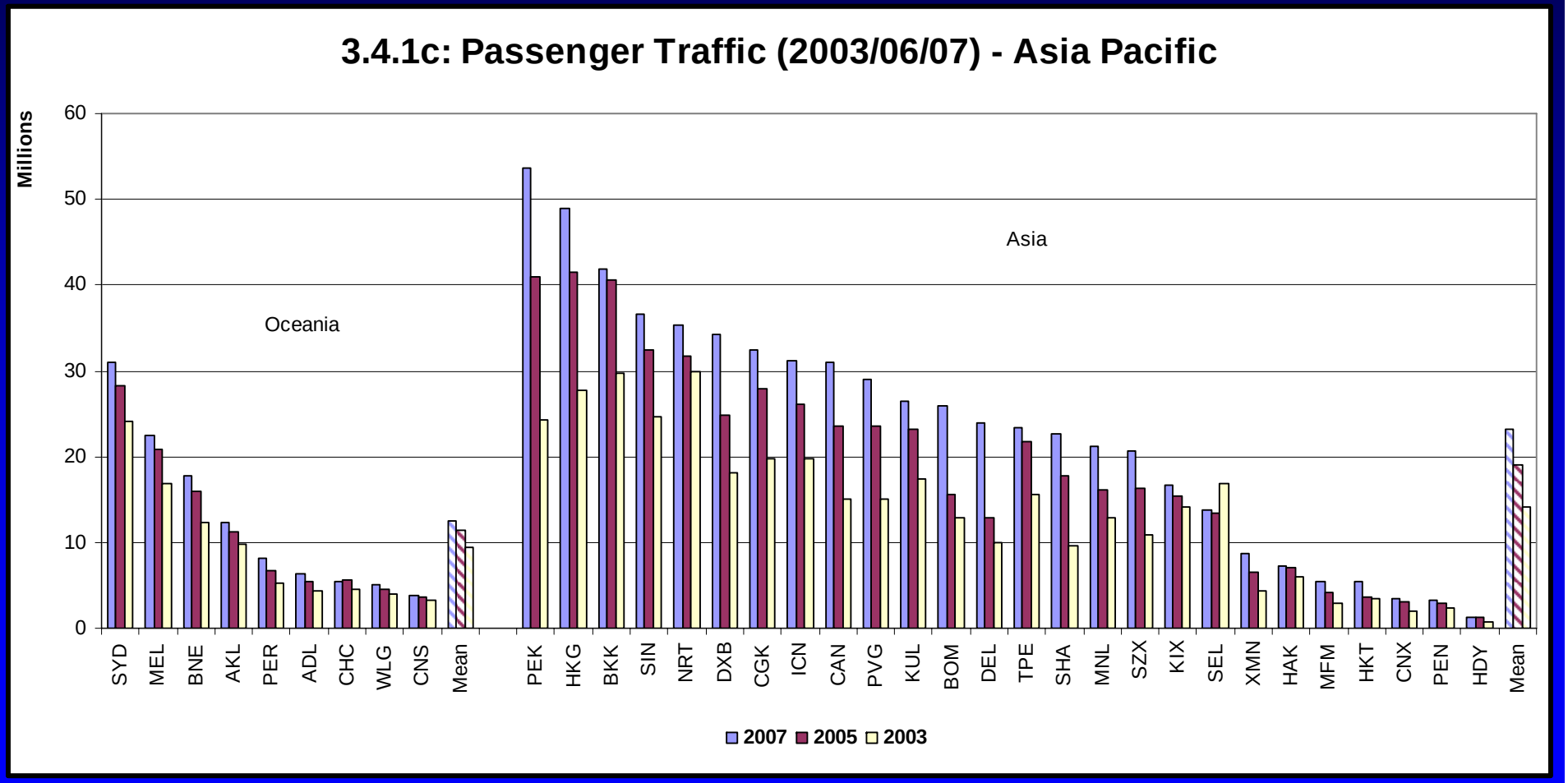
Passenger Traffic - Europe



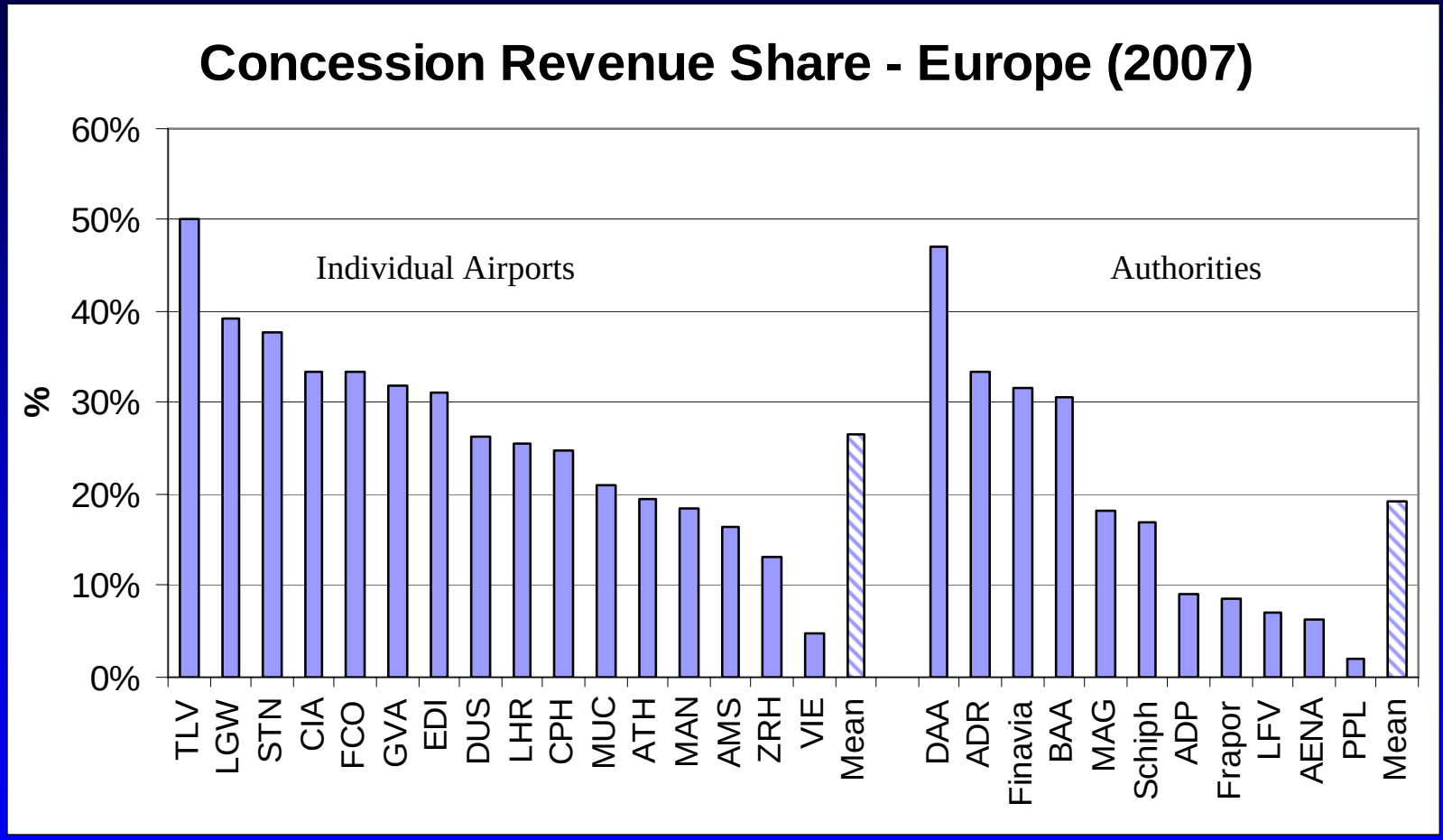
Passenger Traffic - North America



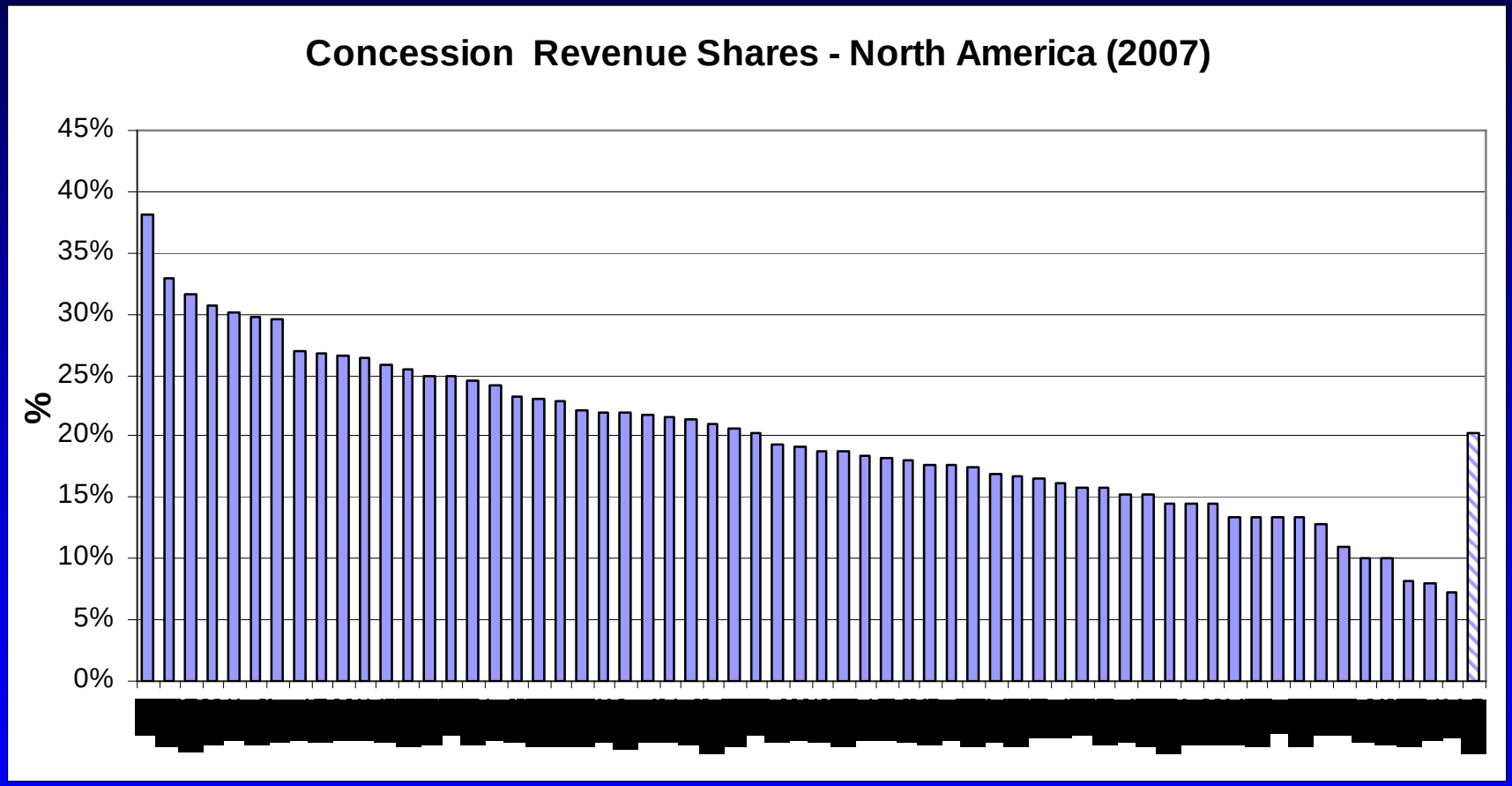
Passenger Traffic – Asia Pacific



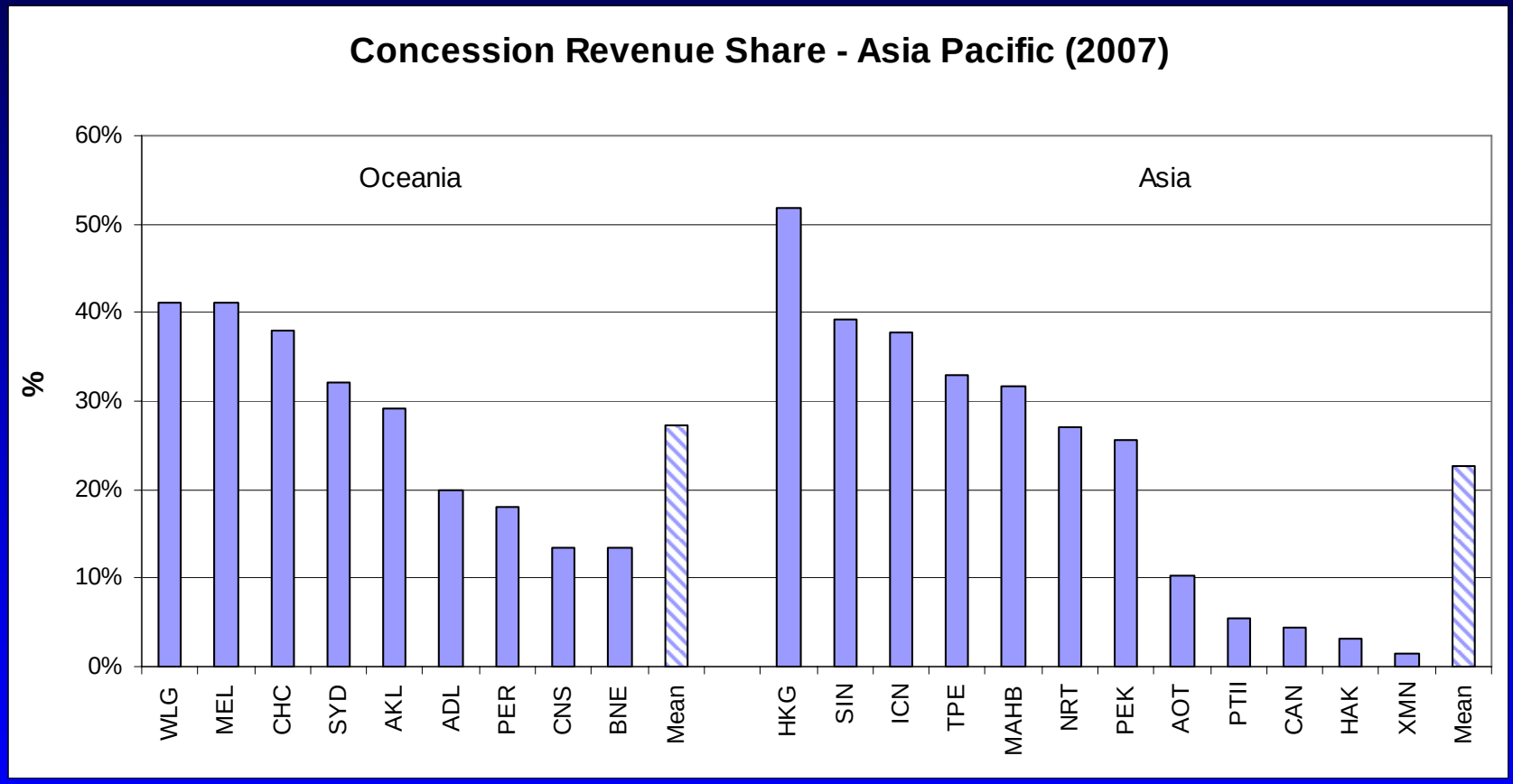
Concession Revenue Shares – Europe



Concession Revenue Shares – N. America



Concession Revenue Shares – Asia-Pacific



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Methodology: EFFICIENCY MEASUREMENT

- **INDEX NUMBER APPROACH:**

  Variable Factor Productivity (VFP)

  - Impossible - Total Factor Productivity (TFP) because of capital input cost accounting problem
  - But calculating **Unit Operating Cost Competitiveness Index** = Combines VFP and Input Price Index

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

Airport Productivity Index

Outputs	Inputs

• Aircraft movement
• Passengers
• (Cargo)
• Other revenues including concessions
	• Labour
	• Other non-capital (soft cost) inputs
	• Physical capital measures:
	  o Runways
	  o Terminals
	  o 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

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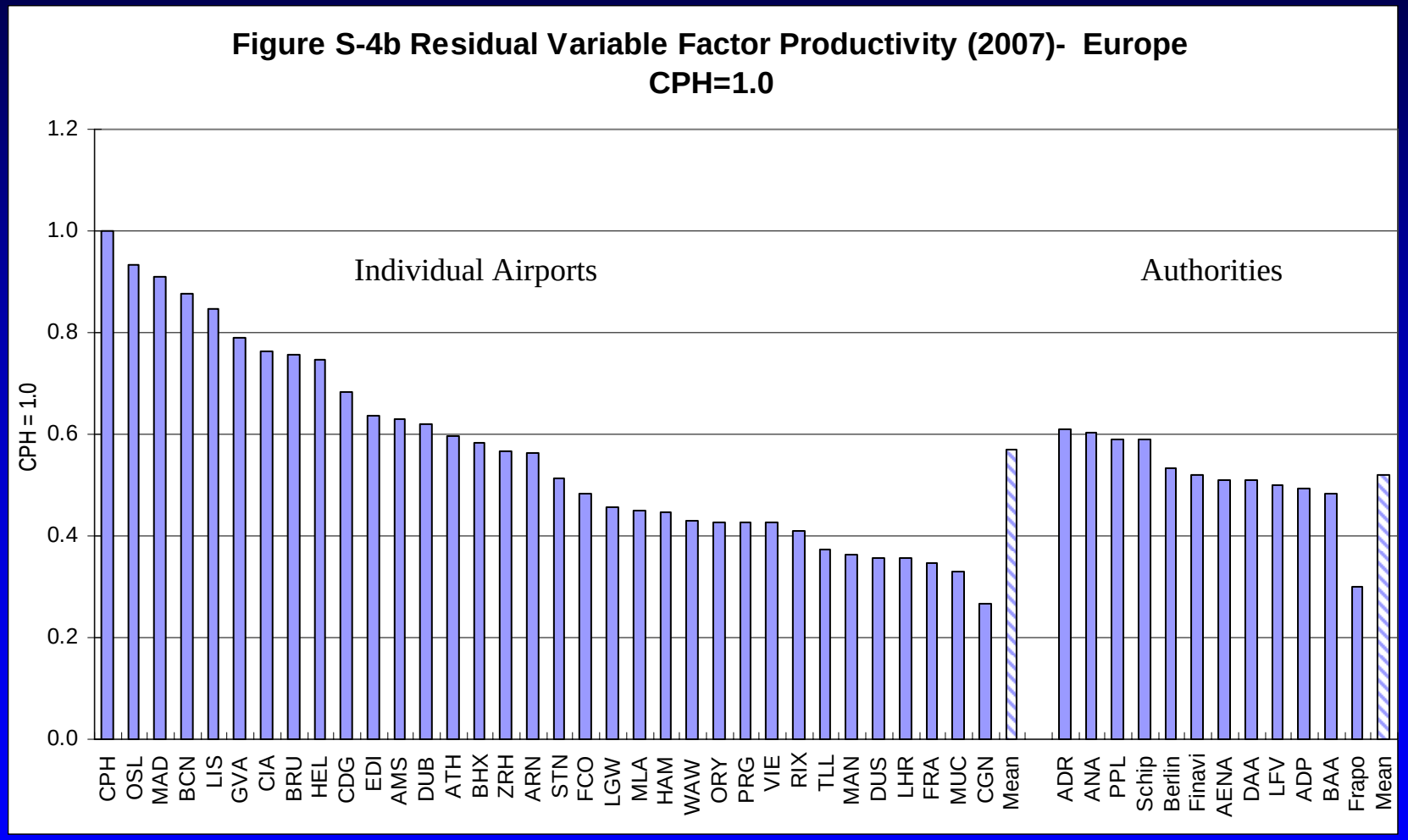
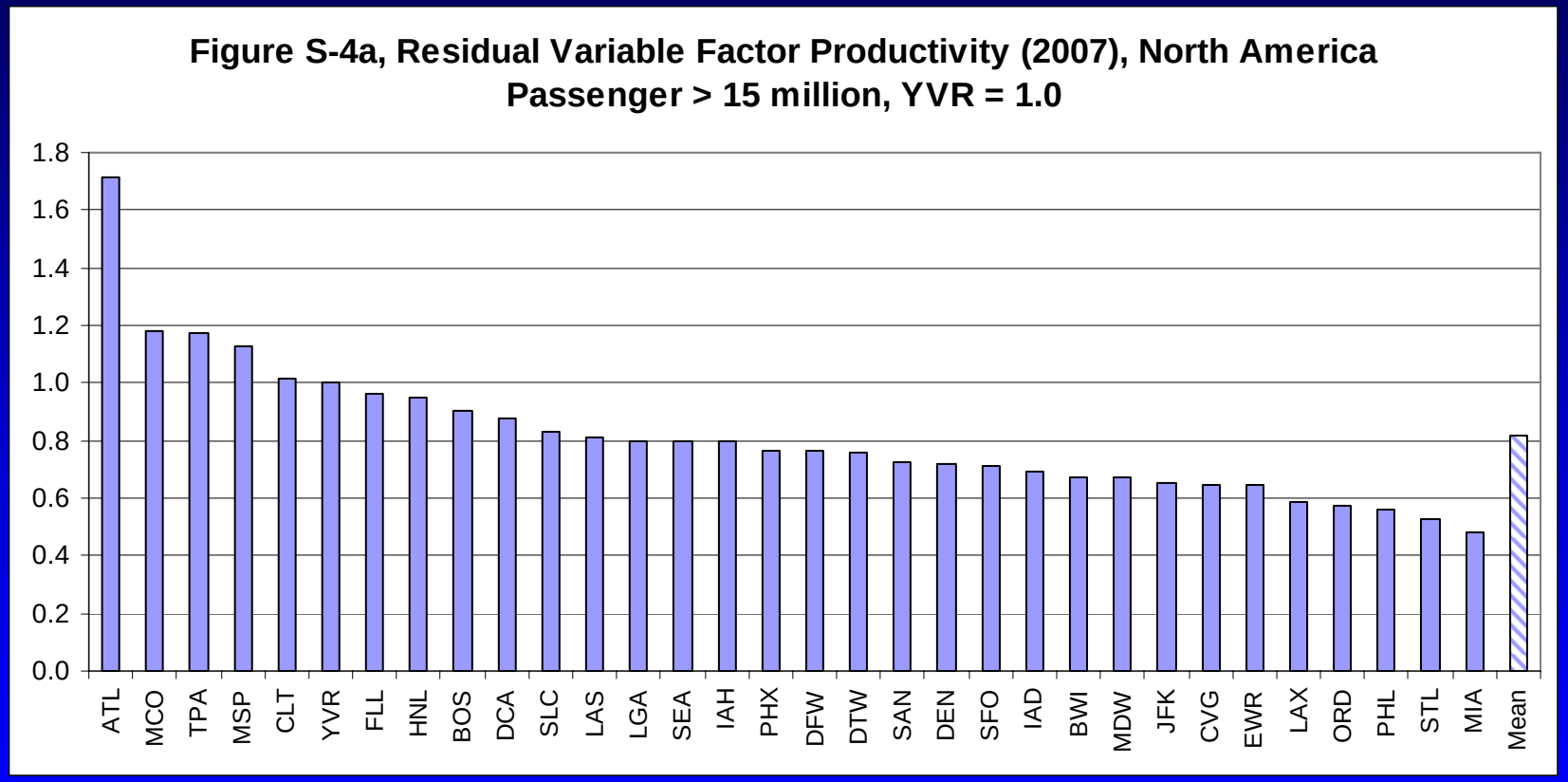
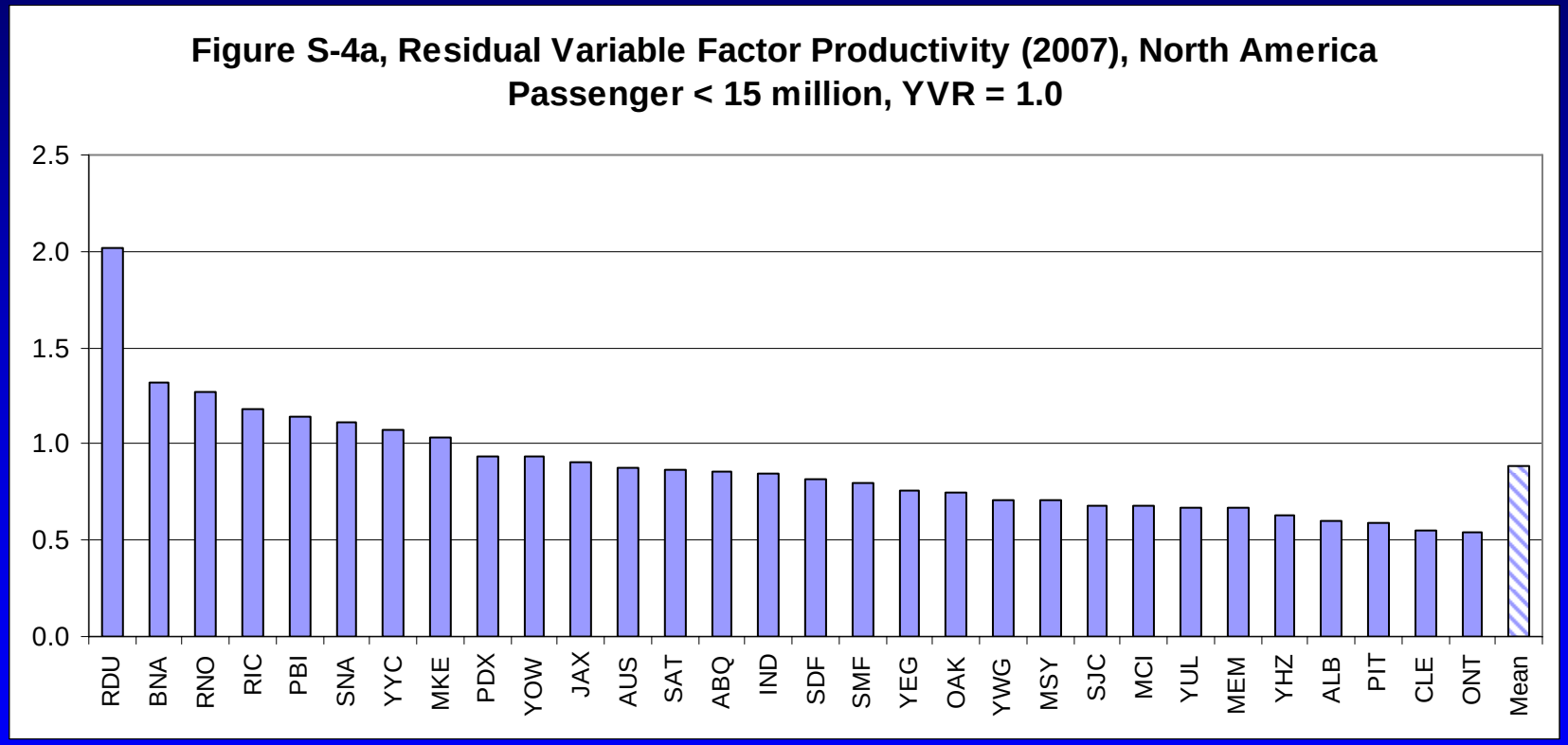
Residual (Net) Variable Factor Productivity:
Overall Efficiency Measure – Europe



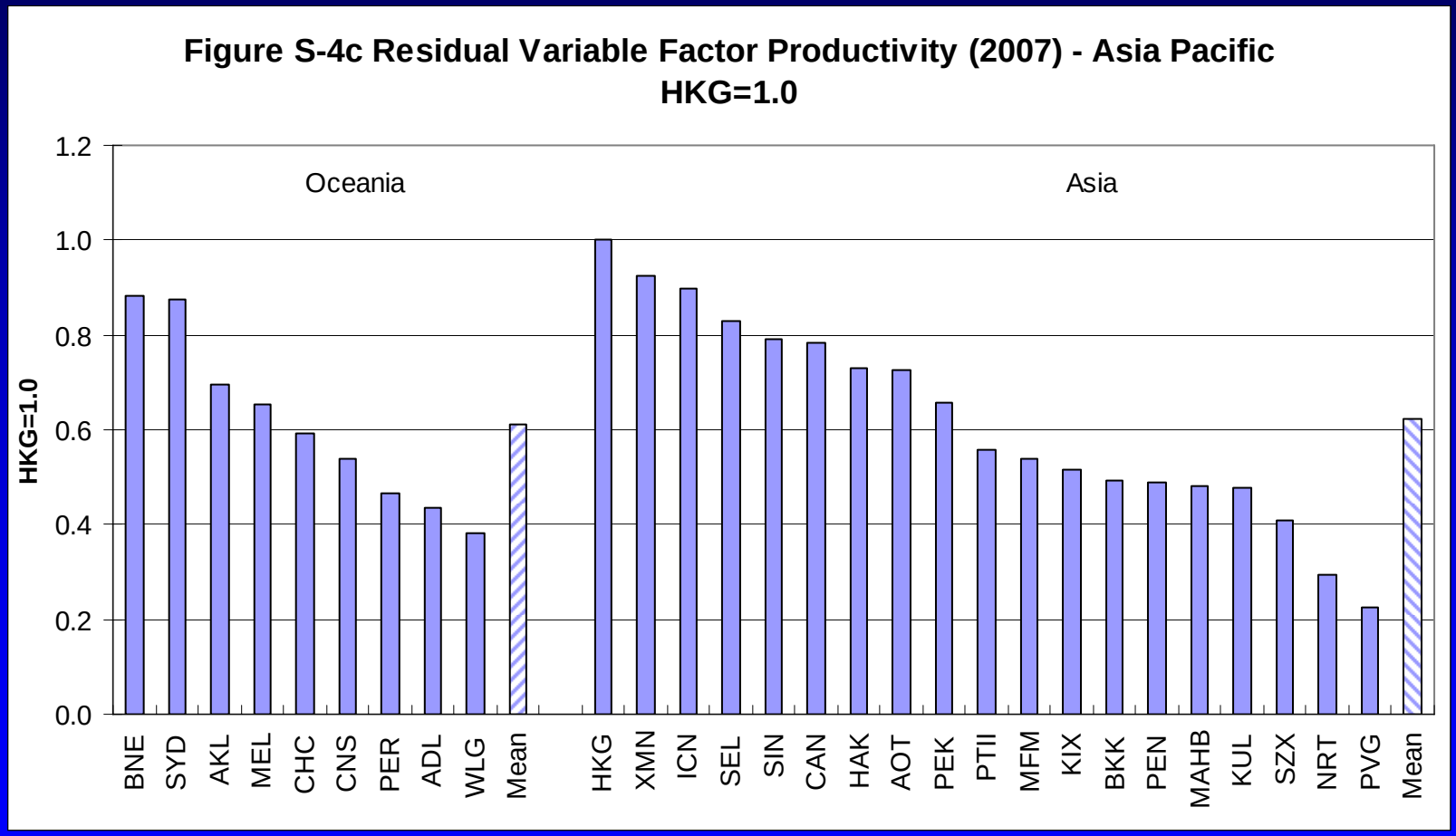
Residual (Net) Variable Factor Productivity:
North America – Passengers > 15 million



Residual (Net) Variable Factor Productivity:
North America – Passengers < 15 million

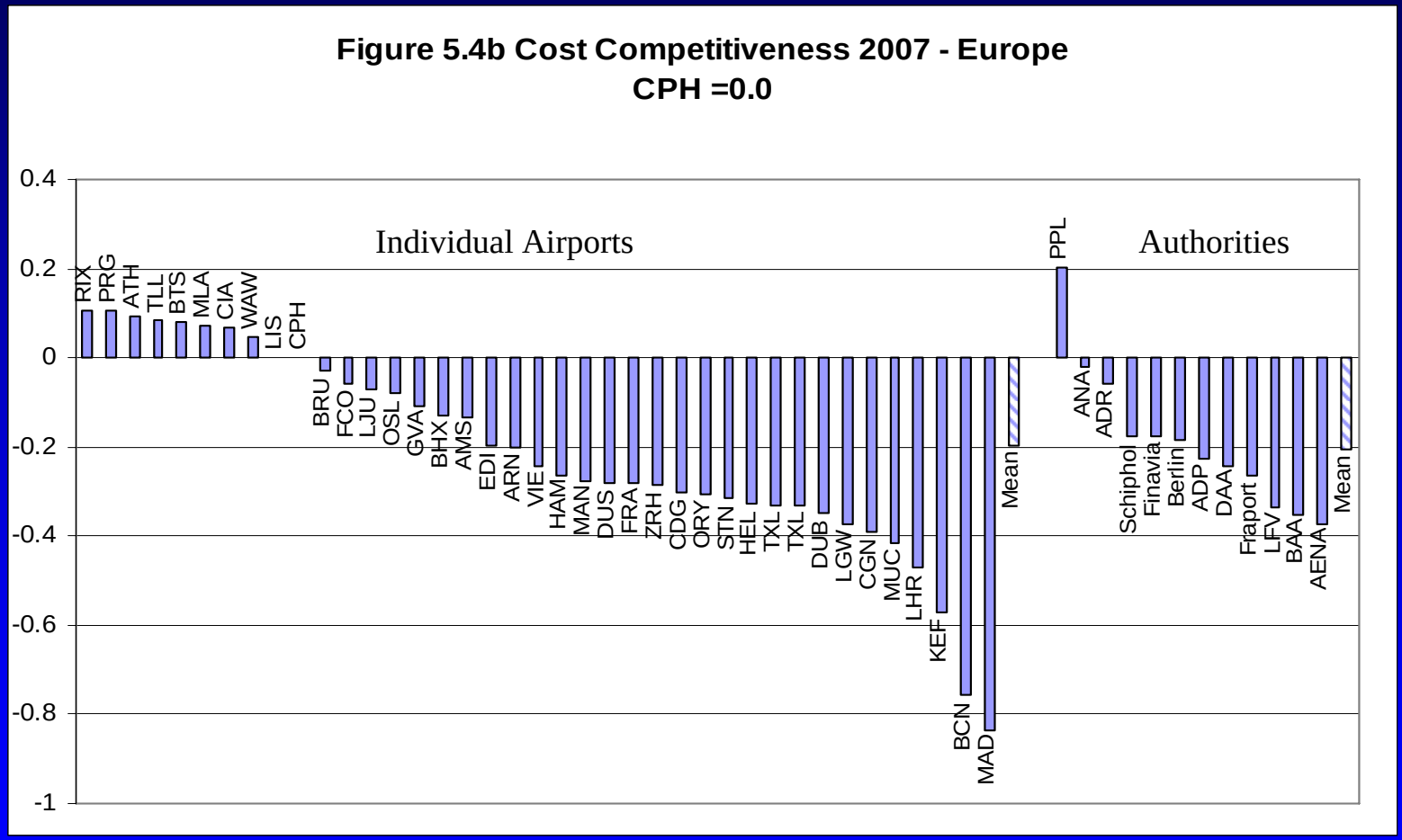


Residual (Net) Variable Factor Productivity:
Overall Efficiency Measure – Asia Pacific

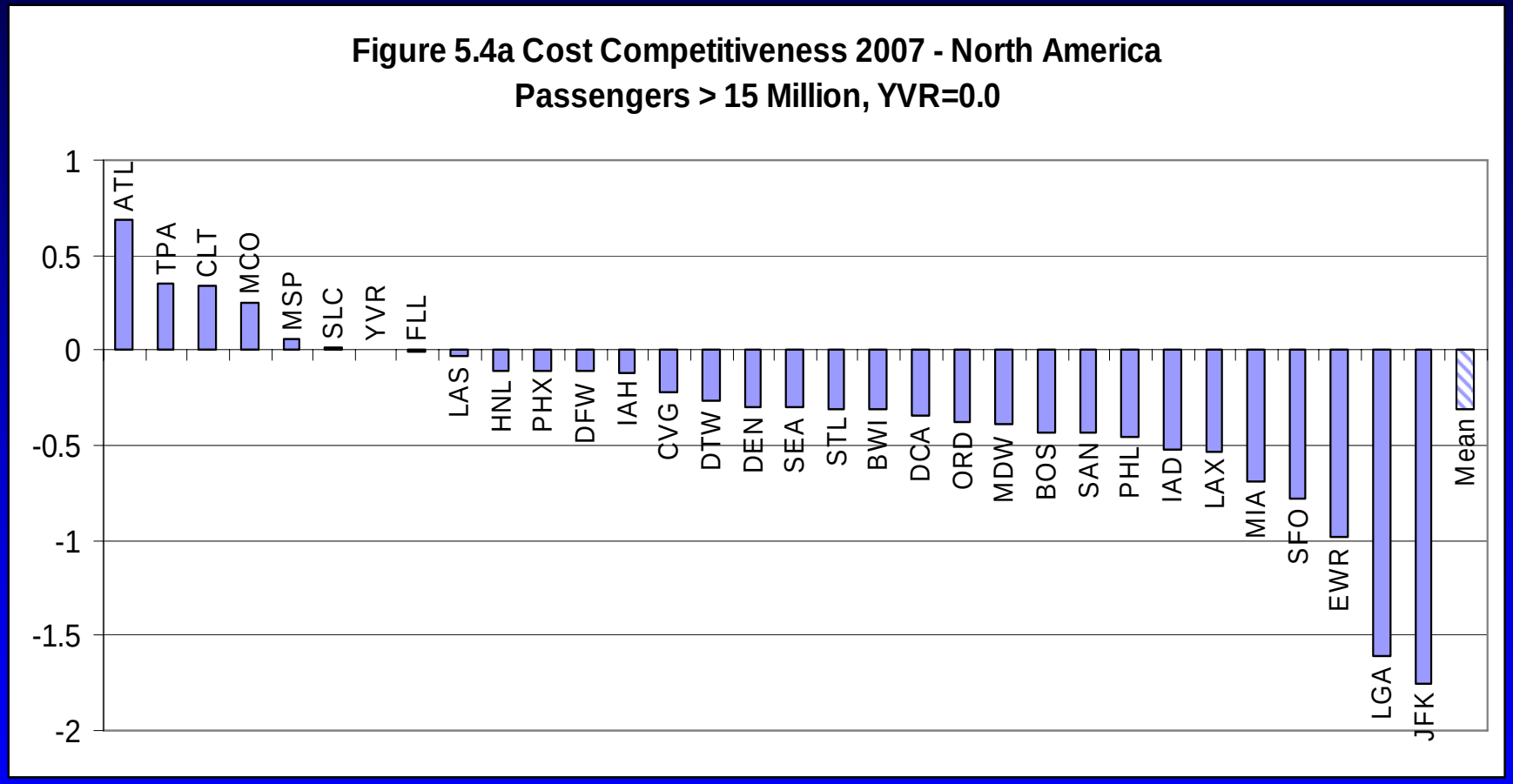


Cost Competitiveness – Europe

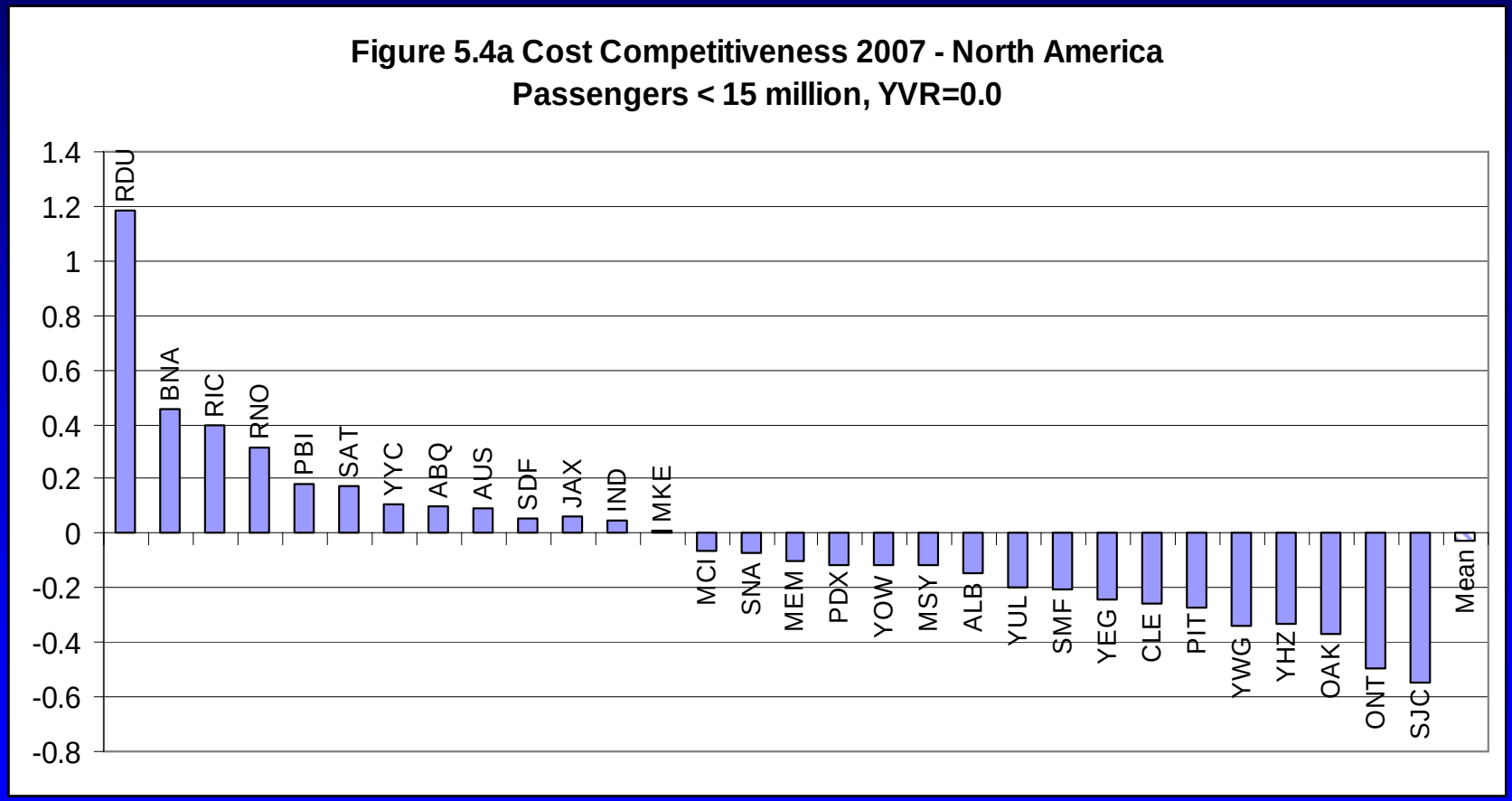
= Net VFP and Input Prices



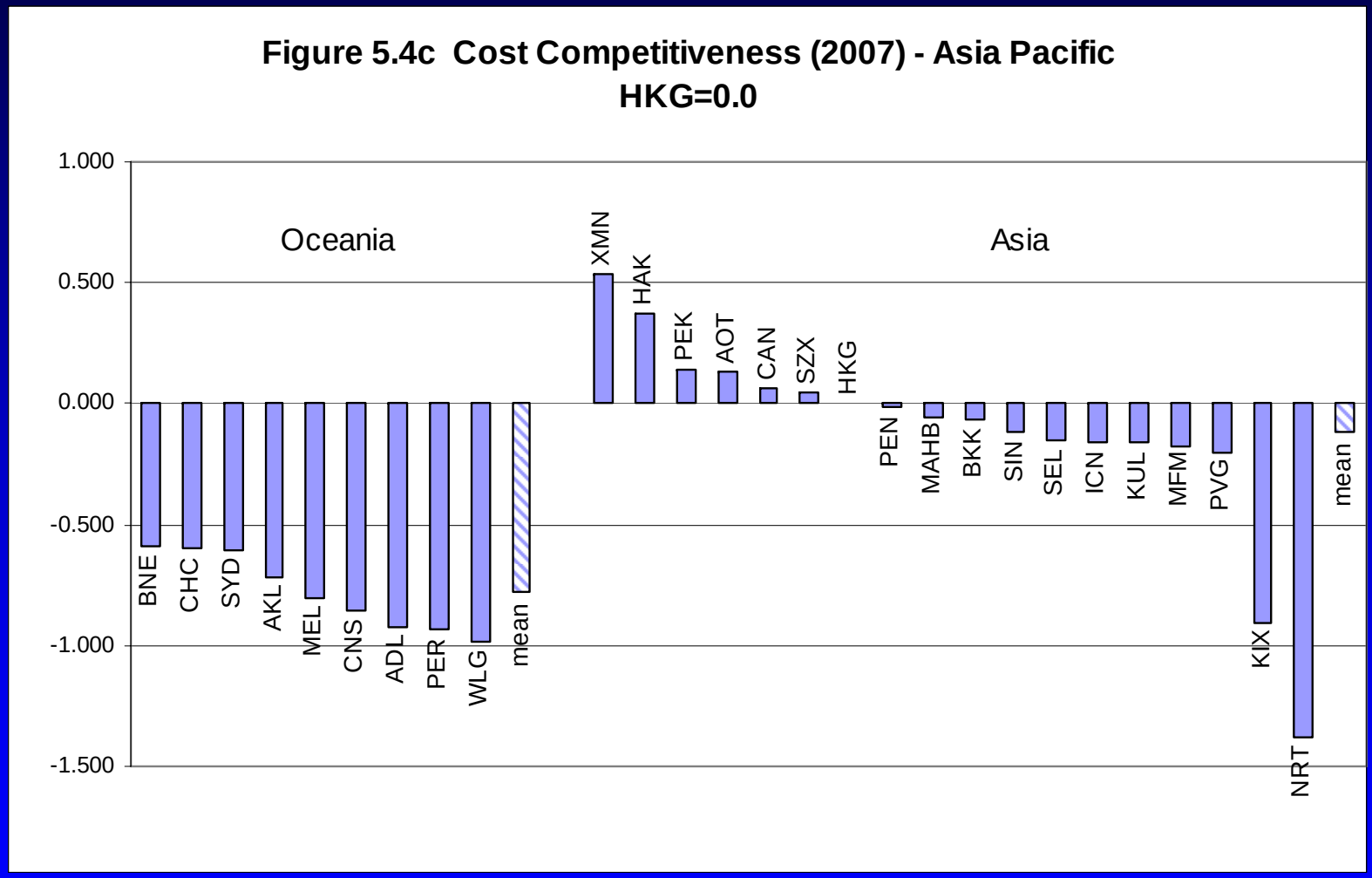
Cost Competitiveness –North America
Pax > 15 million



Cost Competitiveness –North America
Pax < 15 million



Cost Competitiveness – Asia Pacific



Top Performers

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

- Canada/US:
  - Large airports (>15 million PAX): Atlanta, Orlando
  - Small airports (< 15 million PAX): Raleigh-Durham, Nashville
- Europe: Copenhagen, Oslo, Madrid
- Asia-Pacific:
  - Large airports (> 15 million PAX): Hong Kong, Seoul-Incheon
  - Small airports (< 15 million PAX): Xiamen, Seoul-Gimpo
- Oceania: Brisbane, Sydney, Auckland

Top Performers Based on Unit Cost Competitiveness Index

- Canada/US: Raleigh-Durham, Atlanta, Nashville
- Europe: Riga, Prague, Athens, Tallinna
- Asia: Xiamen, Haikou, Beijing
- Oceania: Brisbane, Christchurch, Sydney

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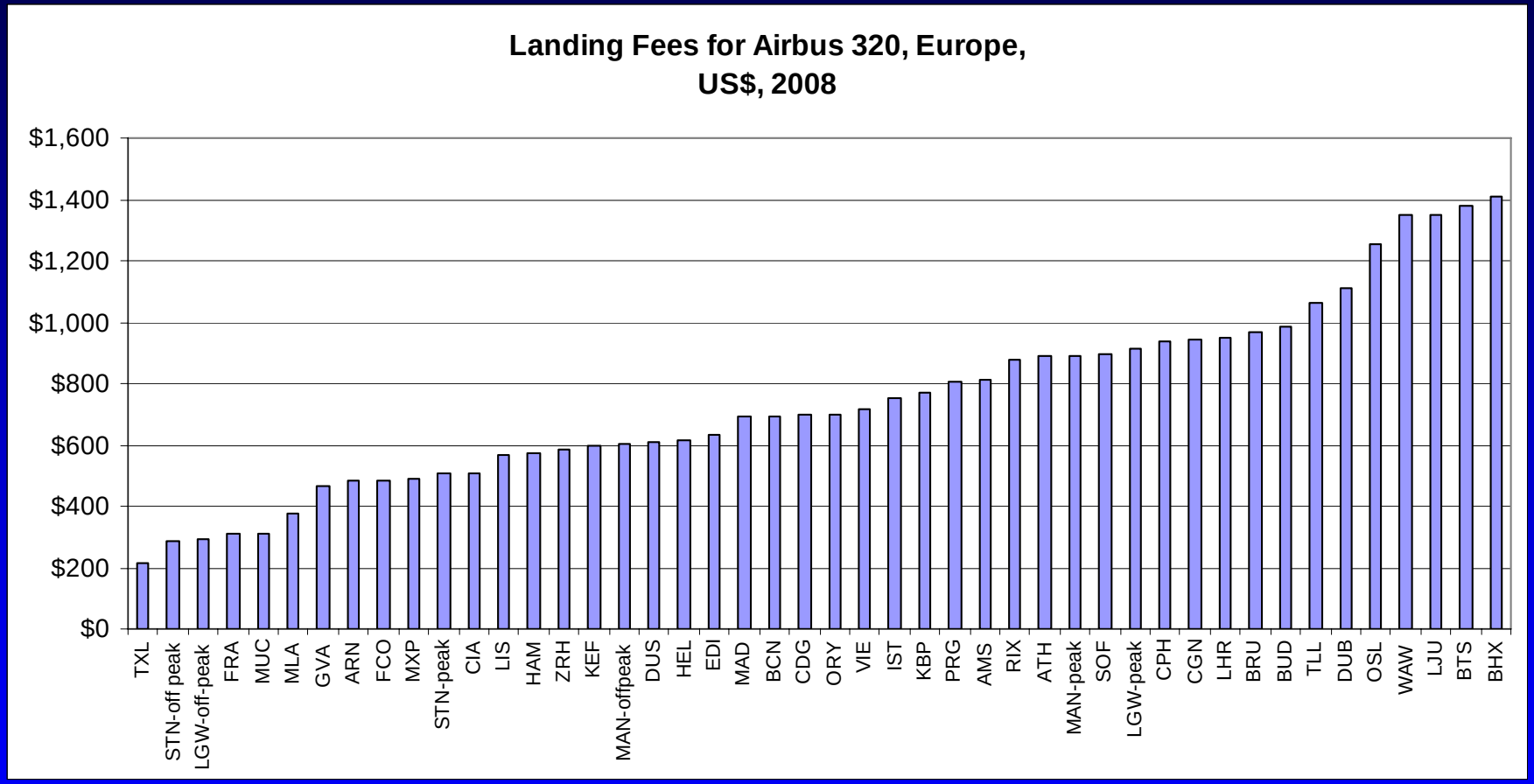
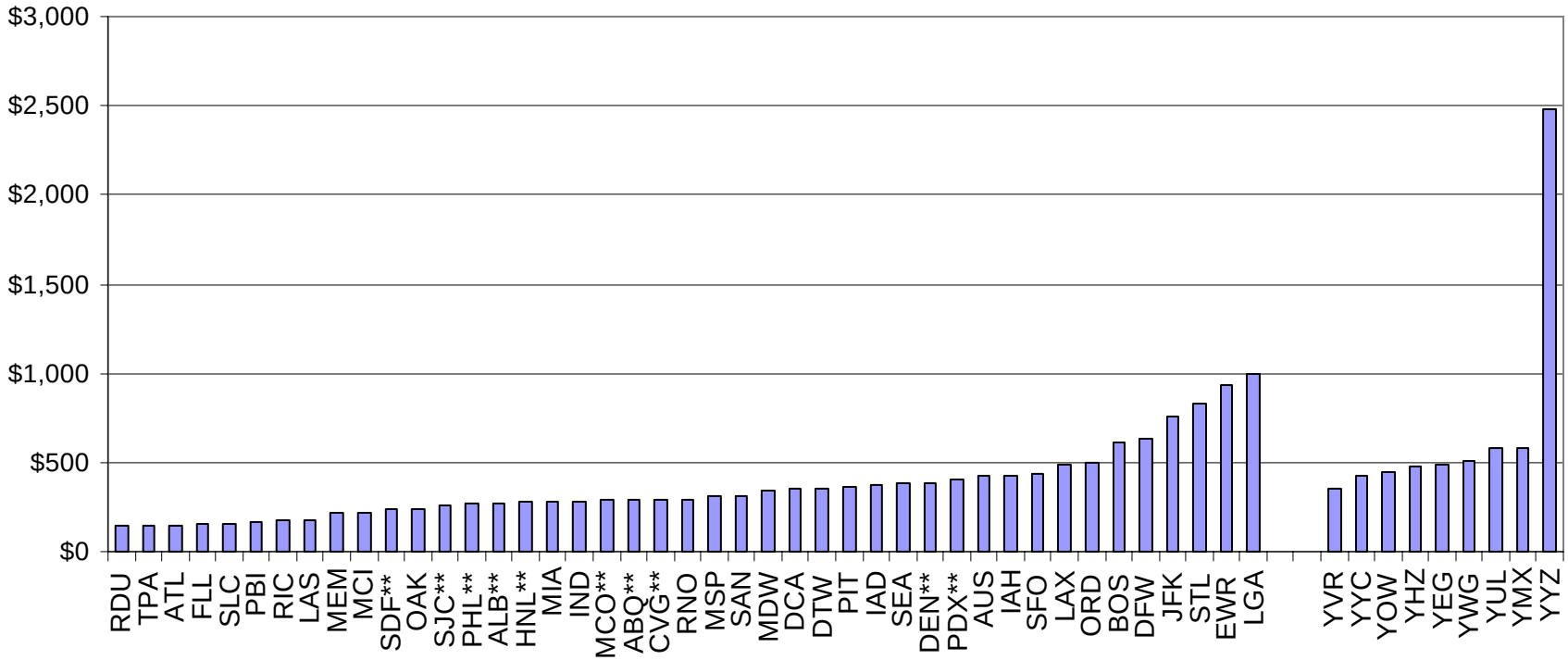
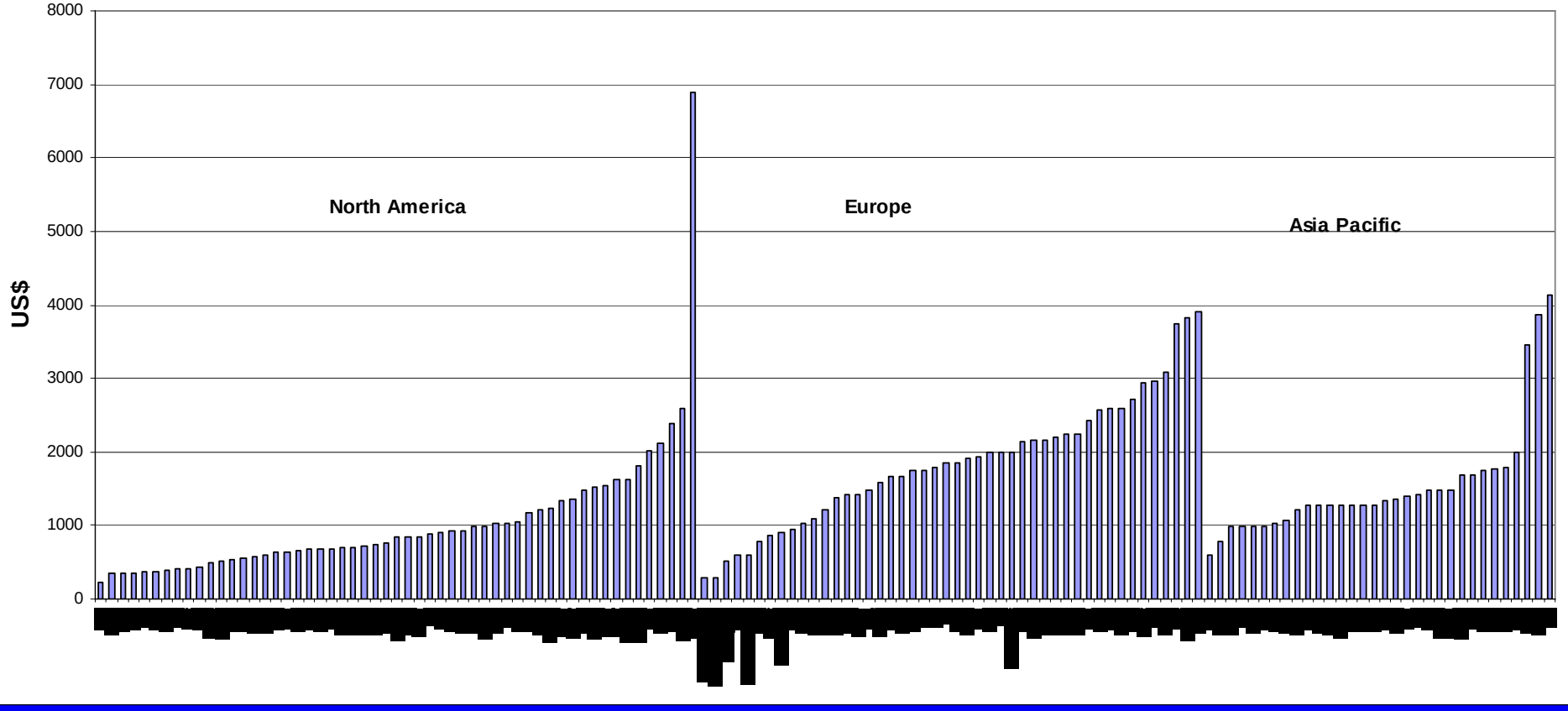

Landing Fees for Airbus 320, Europe,
US$, 2008
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
$0
TXL
STN-off peak
LGW-off-peak
FRA
MUC
MLA
GVA
ARN
FCO
MXP
STN-peak
CIA
LIS
HAM
ZRH
KEF
MAN-offpeak
DUS
HEL
EDI
MAD
BCN
CDG
ORY
VIE
IST
KBP
PRG
AMS
RIX
ATH
MAN-peak
SOF
LGW-peak
CPH
CGN
LHR
BRU
BUD
TLL
DUB
OSL
WAW
LJU
BTS
BHX

Landing Charges for Airbus 320, North America
US$, 2008




Landing Fees for Airbus 320, Asia Pacific
US$, 2008
$2,500
$2,000
$1,500
$1,000
$500
$0
Oceania
Asia
CNS
ADL
AKL
PER
WLG
KUL
DXB
CNX
CEI
HDY
HKT
BKK
CGK
MNL
TPE
SIN
PEK
PVG
CAN
XMN
SHA
HAK
SZX
DEL
BOM
MAA
SEL
ICN
HKG
MFM
NRT
KIX

Figure S-8a Landing Charges for Boeing 767, 2008



Summary – Landing/Takeoff Charges

- North American Results (both B767 and A320):
  - Highest charges: **Toronto,** LaGuardia, Newark, JFK
  - Lowest aircraft movement charges: Atlanta, Charlotte, Tampa, Ft Lauderdale

User Charge vs. Service Quality Trade Off

- Airport should be run as efficiently as possible
- But when it comes to

  User Charge vs. Service Quality trade-off ?

Strive for providing high service quality to airlines and passenger even if you raise user charges

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Results on Business Strategies

- ***Diversification of Revenue Source is good:***
  - Airports with larger share of non-aeronautical revenue achieve higher efficiency (Net VFP)

- ***Outsourcing:***
  - Airports contracting out terminal operations to outside operator achieve higher efficiency
  - Outsourcing terminal operations to expert firms improve efficiency

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Empirical Results on Ownership Forms

- **Majority private sector ownership is best**
- **PPP with a government majority** is worse than even 100% government owned arm length corporation.
- On Average, **Independent Airport Authority** perform better 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 of valuable data and analysis

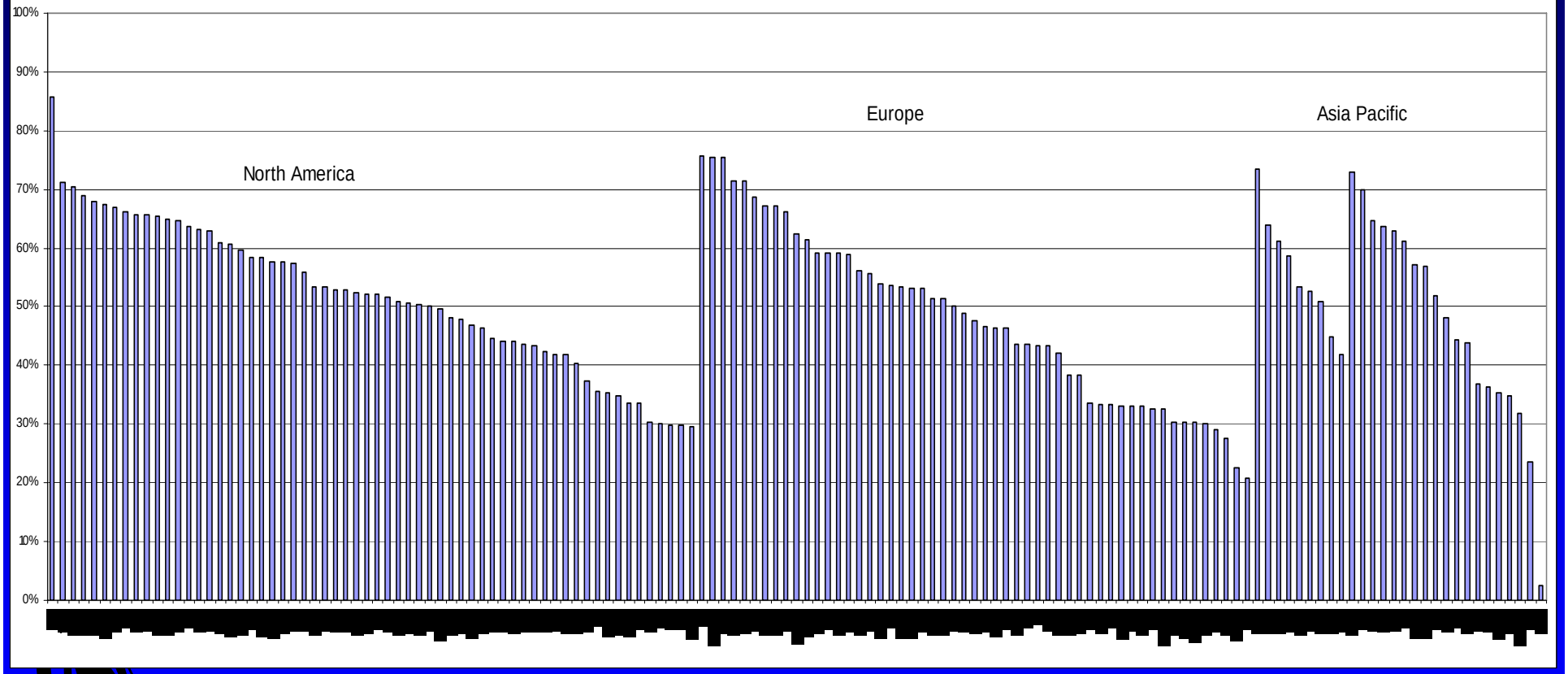
  Can be purchased by visiting

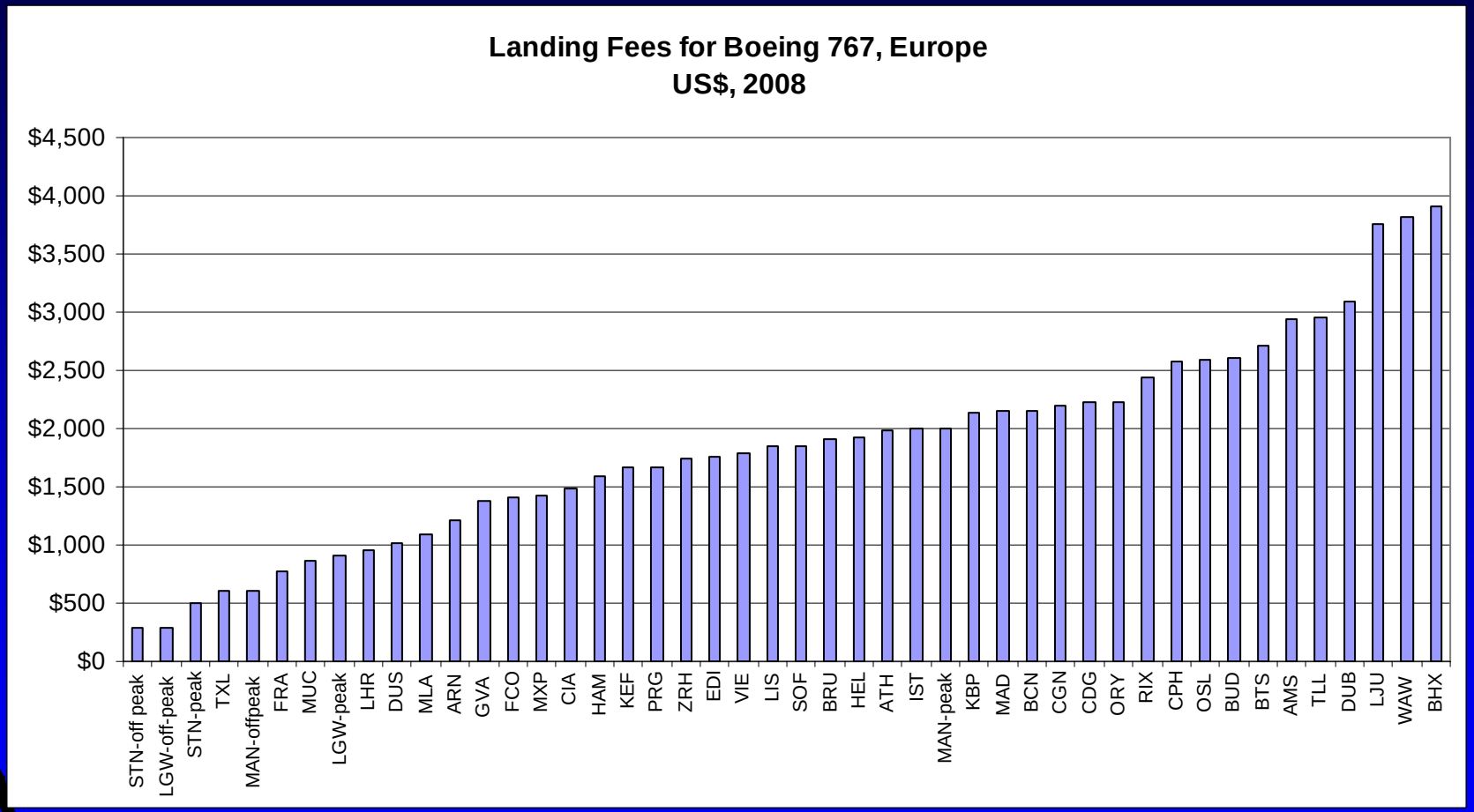
  www.atrsworld.org

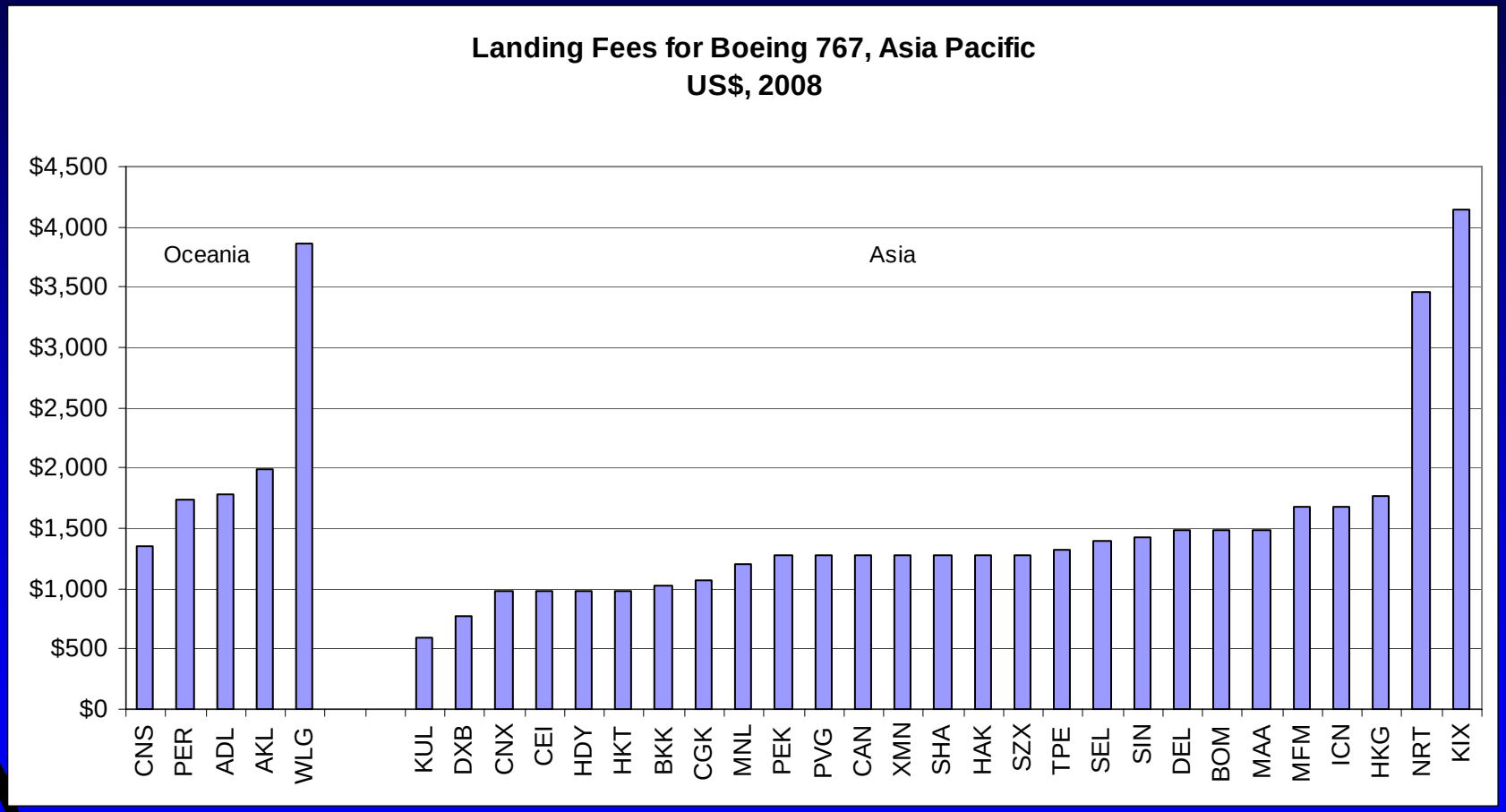
Thank You

Share of Non-Aeronautical Revenue

Figure S-5: Non-Aeronautical Revenue Share (2007)







North America - United States

	Code	Airport Name	City, State
1	ABQ	Albuquerque International Sunport	Atlanta, Georgia
2	ALB	Albany International Airport	Albany, New York
3	ATL	Hartsfield-Jackson Atlanta International Airport	Atlanta, Georgia
4	AUS	Austin Bergstrom Airport	Austin, Texas
5	BNA	Nashville International Airport	Nashville, Tennessee
6	BOS	Boston Logan International Airport	Boston, Massachusetts
7	BWI	Baltimore Washington International Airport	Baltimore, Maryland
8	CLE	Cleveland-Hopkins International Airport	Cleveland, Ohio
9	CLT	Charlotte Douglas International Airport	Charlotte, North Carolina
10	CVG	Cincinnati/Northern Kentucky International Airport	Cincinnati, Ohio
11	DCA	Ronald Reagan Washington National Airport	Washington, DC
12	DEN	Denver International Airport	Denver, Colorado
13	DFW	Dallas/Fort Worth International Airport	Dallas, Texas
14	DTW	Detroit Metropolitan Wayne County Airport	Detroit, Michigan
15	EWR	Newark Liberty International Airport	Newark, New Jersey
16	FLL	Fort Lauderdale Hollywood International Airport	Ft. Lauderdale, Florida
17	HNL	Honolulu International Airport	Honolulu, Hawaii
18	IAD	Washington Dulles International Airport	Washington, DC
19	IAH	Houston-Bush Intercontinental Airport	Houston, Texas
20	IND	Indianapolis International Airport	Indianapolis, Indiana
21	JAX	Jacksonville International Airport	Jacksonville, Florida
22	JFK	New York-John F. Kennedy International Airport	New York, New York
23	LAS	Las Vegas McCarran International Airport	Las Vegas, Nevada
24	LAX	Los Angeles International Airport	Los Angeles, California
25	LGA	LaGuardia International Airport	New York, New York
26	MCI	Kansas City International Airport	Kansas City, Missouri
27	MCO	Orlando International Airport	Orlando, Florida
28	MDW	Chicago Midway Airport	Chicago, Illinois
29	MEM	Memphis International Airport	Memphis, Tennessee
30	MIA	Miami International Airport	Miami, Florida
31	MKE	General Mitchell International Airport	Milwaukee, Wisconsin
32	MSP	Minneapolis/St. Paul International Airport	Minneapolis, Minnesota
33	MSY	Louis Armstrong New Orleans International Airport	New Orleans, Louisiana
34	OAK	Oakland International Airport	Oakland, California
35	ONT	Ontario International Airport	Ontario, California
36	ORD	Chicago O'Hare International Airport	Chicago, Illinois
37	PBI	Palm Beach International Airport	West Palm Beach, FL
38	PDX	Portland International Airport	Portland, Oregon
39	PHL	Philadelphia International Airport	Philadelphia, Pennsylvania
40	PHX	Phoenix Sky Harbor International Airport	Phoenix, Arizona
41	PIT	Pittsburgh International Airport	Pittsburgh, Pennsylvania
42	RDU	Raleigh-Durham International Airport	Raleigh, North Carolina
43	RIC	Richmond International Airport	Richmond, Virginia
44	RNO	Reno/Tahoe International Airport	Reno, Nevada
45	SAN	San Diego International Airport	San Diego, California
46	SAT	San Antonio International Airport	San Antonio, Texas
47	SDF	Louisville Intl-Standiford Field	Louisville, Kentucky
48	SEA	Seattle-Tacoma International Airport	Seattle, Washington
49	SFO	San Francisco International Airport	San Francisco, California
50	SJC	Norman Y. Mineta San José International Airport	San José, California
51	SLC	Salt Lake City International Airport	Salt Lake City, Utah
52	SMF	Sacramento International Airport	Sacramento, California
53	SNA	John Wayne Orange County Airport	Costa Mesa, California
54	STL	St. Louis-Lambert International Airport	St. Louis, Missouri
55	TPA	Tampa International Airport	Tampa, Florida

North America – Canada			
	Code	**Airport Name**	**City, Province**
56	YEG	Edmonton International Airport	Edmonton, Alberta
57	YHZ	Halifax International Airport	Halifax, Nova Scotia
58	YOW	Ottawa International Airport	Ottawa, Ontario
59	YUL	Montréal-Pierre Elliot Trudeau International Airport	Montréal, Québec
60	YVR	Vancouver International Airport	Vancouver, British Columbia
61	YWG	Winnipeg International Airport	Winnipeg, Manitoba
62	YYC	Calgary International Airport	Calgary, Alberta
63	YYZ	Toronto Lester B. Pearson International Airport	Toronto, Ontario

Europe

	Airport Code	Airport Name	City, Country
64	AMS	Amsterdam Schiphol International Airport	Amsterdam, Netherlands
65	ARN	Stockholm Arlanda International Airport	Stockholm, Sweden
66	ATH	Athens International Airport	Athens, Greece
67	BCN	Barcelona El Prat Airport	Barcelona, Spain
68	BHX	Birmingham International Airport	Birmingham, England
69	BRU	Brussels International Airport	Brussels, Belgium
70	BUD	Budapest Ferihegy International Airport	Budapest, Hungary
71	BTS	Bratislava Milan Rastislav Stefanik Airport	Bratislava, Slovak
72	CDG	Paris Charles de Gaulle International Airport	Paris, France
73	CGN	Cologne/Bonn Konrad Adenauer International	Cologne, Germany
74	CIA	Rome Ciampino Airport	Rome, Italy
75	CPH	Copenhagen Kastrup International Airport	Copenhagen, Denmark
76	DUB	Dublin International Airport	Dublin, Ireland
77	DUS	Flughafen Dusseldorf International Airport	Dusseldorf, Germany
78	EDI	Edinburgh Airport	Edinburgh, Scotland
79	FCO	Rome Leonardo Da Vinci/Fiumicino Airport	Rome, Italy
80	FRA	Frankfurt Main International Airport	Frankfurt, Germany
81	GVA	Geneva Cointrin International Airport	Geneva, Switzerland
82	HAM	Hamburg International Airport	Hamburg, Germany
83	HEL	Helsinki Vantaa International Airport	Helsinki, Finland
84	IST	Istanbul Atatürk International Airport	Istanbul, Turkey
85	KBP	Boryspil State International Airport	Kiev, Ukraine
86	KEF	Keflavik International Airport	Reykjavik, Iceland
87	LGW	London Gatwick International Airport	London, England
88	LHR	London Heathrow International Airport	London, England
89	LIS	Lisbon Portela Airport	Lisbon, Portugal
90	LJU	Ljubljana Airport	Ljubljana, Slovenia
91	MAD	Madrid Barajas International Airport	Madrid, Spain
92	MAN	Manchester International Airport	Manchester, England
93	MLA	Malta International Airport	Valletta, Malta
94	MUC	Munich International Airport	Munich, Germany
95	MXP	Milan Malpensa International Airport	Milan, Italy
96	ORY	Paris Orly Airport	Paris, France
97	OSL	Oslo Airport	Oslo, Norway
98	PRG	Prague International Airport	Prague, Czech Republic
99	RIX	Riga International Airport	Riga, Latvia
100	SOF	Sofia International Airport	Sofia, Bulgaria
101	STN	London Stansted Airport	London, England
102	TLL	Tallinn Airport	Tallinn, Estonia
103	TXL	Berlin Tegel Airport	Berlin, Germany
104	VIE	Vienna International Airport	Vienna, Austria
105	WAW	Warsaw Frederic Chopin Airport	Warsaw, Poland
106	ZRH	Zurich International Airport	Zurich, Switzerland

Major Airport Authorities

Airport Code	Airport Name	
ADP	Aeroports de Paris	France
ADR	Aeroporti di Roma	Italy
AENA	Aeropuertos Españoles y Navegación Aérea	Spain
ANA	Aeroportos de Portugal	Portugal
BAA	British Airport Authority	United Kingdom
Berlin	Berlin Airports	Germany
DAA	Dublin Airport Authority**	Ireland
Finavia	Ilmailulaitos Finavia*	Finland
Fraport	Fraport AG	Germany
LFV	The LFV Group***	Sweden
PLL	Polish Airports State Enterprise	Poland
Schiphol	Schiphol Group	Dutch

Asia Pacific

	Code	Airport Name	City, Country
107	ADL	Adelaide International Airport	Adelaide, Australia
108	AKL	Auckland International Airport	Auckland, New Zealand
109	BKK	Bangkok International Airport	Bangkok, Thailand
110	BNE	Brisbane Airport	Brisbane, Australia
111	BOM	Chhatarpati Shivaji International Airport	Mumbai, India
112	CAN	Bai Yun Airport	Guangzhou, China
113	CGK	Jakarta Soekarno-Hatta International Airport	Jakarta, Indonesia
114	CHC	Christchurch International Airport	Christchurch, New Zealand
115	CNS	Cairns International Airport	Cairns, Australia
116	CNX	Chiang Mai International Airport	Chiang Mai, Thailand
117	DEL	Indira Gandhi International Airport	New Delhi, India
118	DXB	Dubai International Airport	Dubai, UAE
119	HAK	Meilan International Airport	Haikou, China
120	HDY	Hat Yai International Airport	Hat Yai, Thailand
121	HKG	Hong Kong Chek Lap Kok International Airport	Hong Kong, Hong Kong
122	HKT	Phuket International Airport	Phuket, Thailand
123	ICN	Incheon International Airport	Seoul, Korea
124	KIX	Kansai International Airport	Osaka, Japan
125	KUL	Kuala Lumpur International Airport	Kuala Lumpur, Malaysia
126	MAA	Chennai International Airport	Chennai, India
127	MEL	Melbourne Tullamarine International Airport	Melbourne, Australia
128	MFM	Macau International Airport	Macau
129	MNL	Ninoy Aquino International Airport	Manila, Philippines
130	NRT	Tokyo Narita International Airport	Tokyo, Japan
131	PEK	Beijing Capital International Airport	Beijing, China
132	PEN	Penang International Airport	Penang, Malaysia
133	PER	Perth International Airport	Perth, Australia
134	PVG	Shanghai Pudong International Airport	Shanghai, China
135	SEL	Seoul Gimpo International Airport	Seoul, South Korea
136	SHA	Shanghai Hongqiao International Airport	Shanghai, China
137	SIN	Singapore Changi International Airport	Singapore, Singapore
138	SYD	Sydney Kingsford Smith International Airport	Sydney, Australia
139	SZX	Shenzhen Baoan International Airport	Shenzhen, China
140	TPE	Chiang Kai-Shek International Airport	Taipei, Taiwan
141	WLG	Wellington International Airport	Wellington, New Zealand
142	XMN	Xiamen Gaoqi International Airport	Xiamen, China

Airport Code	Major Airport Authoritities	Country
AAI	Airports Authority of India	India
AOT	Airports of Thailand Public Company Limited	Thailand
MAHB	Malaysia Airports Holding Behard	Malaysia
PTII	P.T. (Persero) Angkasa Pura II	Indonesia
SAA	Shanghai Airport Authority	China