

' THE ECONOMIC CRISIS AND THE IMPACT ON THE NETWORK QUALITY OF HUB AIRPORTS '
AIRNETH WORKSHOP

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Is de-hubbing reversible?

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Outline

- **Airport de-hubbing**
 - Recent US and EU hub shrinking: major causes and their effects
 - After de-hubbing: some possible scenarios and their implications
 - The effects of the recent crisis on EU network quality
 - Conclusions

Hub networks

- A hub is a transfer node at which an airline concentrates its operations and air services feeding traffic (typically long-haul traffic) to and from each node operating a co-ordinated wave-system structure.
- The more networked air services, the more dominant the airport is likely to be: the significance of agglomeration economies/network externalities (economies of scope and density) is that it ties the individual airline to the hub airport.
- Both airlines and passengers gain from concentrating services at a transfer point: the use of larger and more economical aircrafts (i.e. airlines), increased frequency and network scope (i.e. passengers).

Airport de-hubbing

- The hub carrier ceases to operate a wave-system structure de-camping all or part of its operations from the hub: the hub suffers significant reductions in its traffic volumes.
- Empty infrastructures and sunk costs

Why?

- Hub carrier bankruptcy
- Mergers and takeovers
- Airline network restructuring

Why?

1. Hub carrier bankruptcy

- Bankruptcy in response to long-standing structural challenges in the industry (high fixed costs, cyclical demand for its services or intense competition), liquidity pressures and weak financial performance.
- Airlines seek bankruptcy as a means to restructure (Chapter 11 reorganization), but are not always successful in reducing costs (unit costs can go up and by more than the industry average, i.e. TWA 1992 or US Airways 2002).

Why?

1. Hub carrier bankruptcy

2. Mergers and takeover

- Mergers and acquisitions could bring reconfigurations of the balance among alliances, that can allow airlines to create multiple-hub networks and be vehicles for further exploitation of hub-and-spoke system advantages .
- The trend seems to meet the strategic needs of major carriers following the enlargement of competition areas between Europe and the United States within the Open Skies agreement
- Merging of Delta and Northwest; Air France's acquisition of 25% share in Alitalia; Lufthansa has already bought Swiss and Air Austrian and is completing the acquisition of Brussel Air and BMI

Why?

1. Hub carrier bankruptcy
2. Mergers and takeover

3. Airline network restructuring

- A carrier could be induced to restructure its network due to:
 - Network shrinking induced by economic crises
 - New hub options available due to liberalization process
 - Reconfigurations within alliances

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De-hubbing in US and Europe

No.	Airport	Code	Region	Year	Hub carrier	Cause	% passengers after 1 year	% passengers after 2 year
1	Denver	DEN	US	1994	Continental	Network restructure-New airport	-4,85%	1,65%
2	Nashville	BNA	US	1995	Americal Airways	Network restructure	-12,84%	-8,55%
3	San Jose	SJC	US	1995	Americal Airways	Network restructure	3,51%	17,41%
4	Gatwick	LGW	Europe	2000	British Airways	Network restructure	-2,75%	-7,60%
5	Raleigh-Durham	RDU	US	2001	Midway	Bankruptcy	-12,70%	-13,41%
6	Brussels	BRU	Europe	2001	Sabena	Bankruptcy	-26,78%	-22,95%
7	Basel	BSL	Europe	2001	Swissair	Bankruptcy	-14,52%	-29,14%
8	Baltimore	BWI	US	2001	US Airways	Financial problems	-4,70%	0,71%
9	Zurich	ZRH	Europe	2001	Swissair	Bankruptcy	-14,75%	-18,44%
10	Pittsburgh	PIT	US	2003	US Airways	Network restructure- high operation fees	-7,10%	-26,98%
11	Clermont-Ferrand	CFE	Europe	2004	Air France	Network restructure	-33,33%	-38,04%
12	Cincinnati	CVG	US	2005	Delta-Northwest Airlines	Financial problems/Merger	-28,76%	-31,16%
13	Barcelona	BCN	Europe	2006	Iberia	Network restructure	-7,90%	-18,13%
14	Malpensa	MPX	Europe	2008	Alitalia	Bankruptcy. Network restructure	-19,53%	-22,50*

* It refers to June 2009

US

- **Cincinnati (2005) Delta Airlines** and its subsidiary **Comair** entered Chapter 11 amid high fuel prices and the burdens of high labor and pension expenses; now Atlanta-based Delta has grown into the largest airline in the world through its merger with Northwest.
- **Pittsburgh (2003) US Airways** moved its operations to Philadelphia and Charlotte for lower operating fees, due to its economies of scale (or low cost competition?). More flight cuts (Florida markets as well as Indianapolis) took effect in early January 2009 as part of a reduction in capacity due to higher fuel costs. In April 2009, ending service to Los Angeles and San Francisco

US

- **Baltimore (2001) US Airways** de-hubbed due to the resulting financial disaster following September 11 which lead to the closure of the no frills airline's division **MetroJet network**
- **Raleigh-Durham (2001) Midway** ceased operations through a Chapter 7 bankruptcy
- **San Jose (1995) American Airlines** de-hubbed: Reno Air took over many of its gates until it was bought out by American in 1998. SJC lost much of its transcontinental U.S. service in the fall with Continental ending Newark flights, JetBlue ceasing Boston service, and United ending longtime service to its Chicago-O'Hare and Washington-Dulles hubs.

US

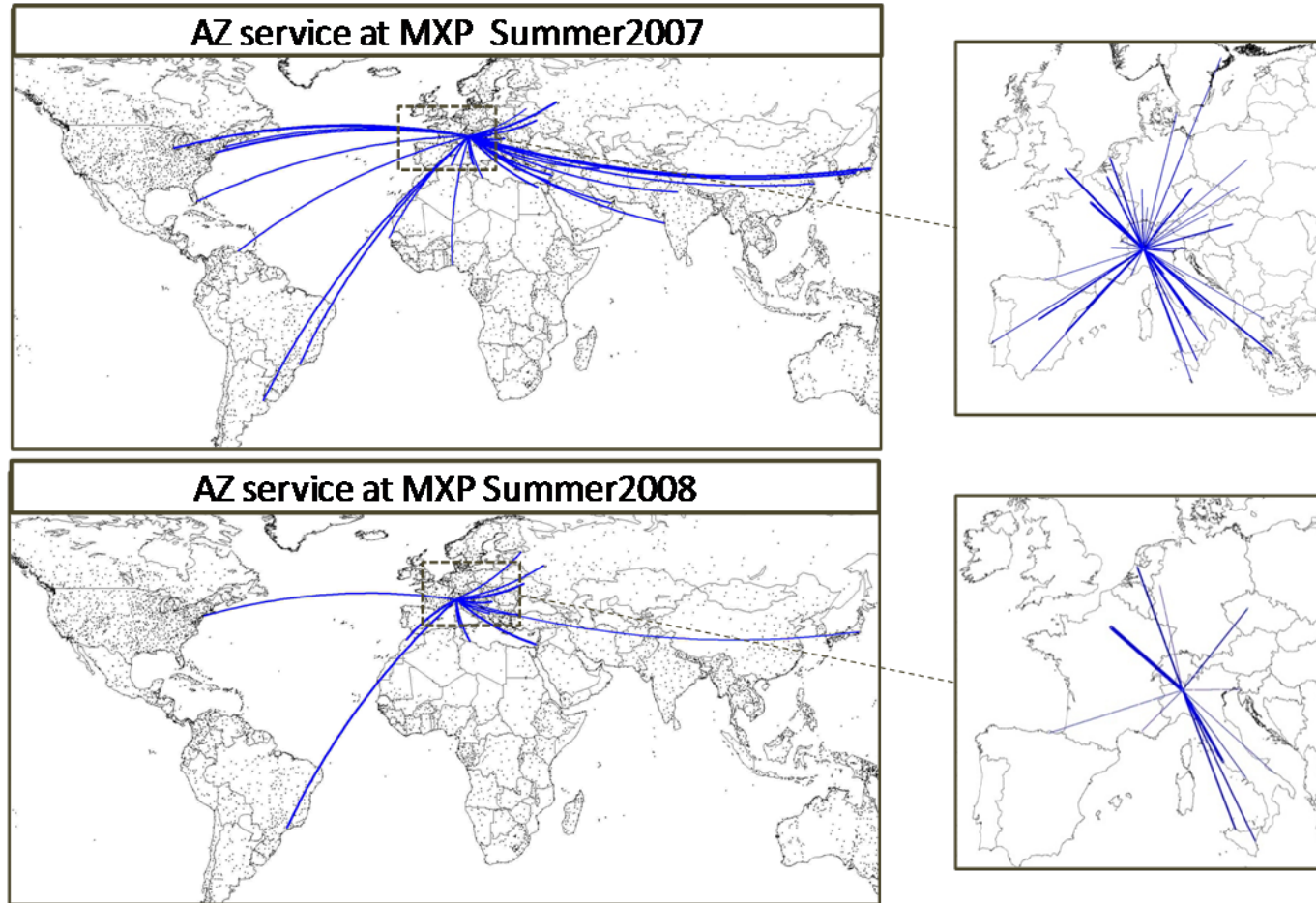
- **Nashville (1995) American Airlines** ceased its operation. Overall capacity and total traffic declined. Important remaining hub after de-hubbing: Dallas DFW, Chicago ORD
- **Denver (1994) Continental** did not move from the old airport to the new airport. United took over the hub role in the new airport

Europe

- **Milan MPX (2008) Alitalia** bankruptcy network restructuring. The share of ASK offered by the company from Milan MPX declined in 2008 from 55% to 31%;

In comparison, it is noticeable the effect of Alitalia's concentration of its service on Rome Fiumicino (37.2% share of ASK, with an increase of 10% compared to 27.9% in 2007)

Alitalia's scheduling evolution from Milan MPX (2007-2008)



Source: ICCSAI processing over INNOVATA scheduling

Europe

- **Barcelona (2006)** hands over much of its European network from Barcelona to low-cost carrier **Click Air**. Iberia's market share in Barcelona has fallen to 27.3% this year from 43.7% in 2004. Meanwhile it put focus on Latin America to defend its Madrid hub.
- **Clermont-Ferrand (2004) Air France** scales down hub-operations at CF, preferring Lyon because of much larger origin-destination market.
- **Zurich, Basel (2001) SwissAir** failed for bankruptcy. On April 2002 the successor airline **Swiss Int. Air Lines** was founded on the base of former Crossair, and Zurich became its Switzerland's largest international flight gateway and hub.

Europe

- **Brussels (2001) Sabena** bankruptcy and renewal into SN Brussel Airlines
- **Gatwick (2000) British Airways** plans to shuffle air services between Gatwick and Heathrow (**project Jupiter**, mid-1990s): a number of BA's long-haul routes were moved to Heathrow from Gatwick with the intention to free slots at Heathrow. The decision to place less emphasis on low-yield transfer traffic led to a further re-shuffling of routes between the two airports.

Outline

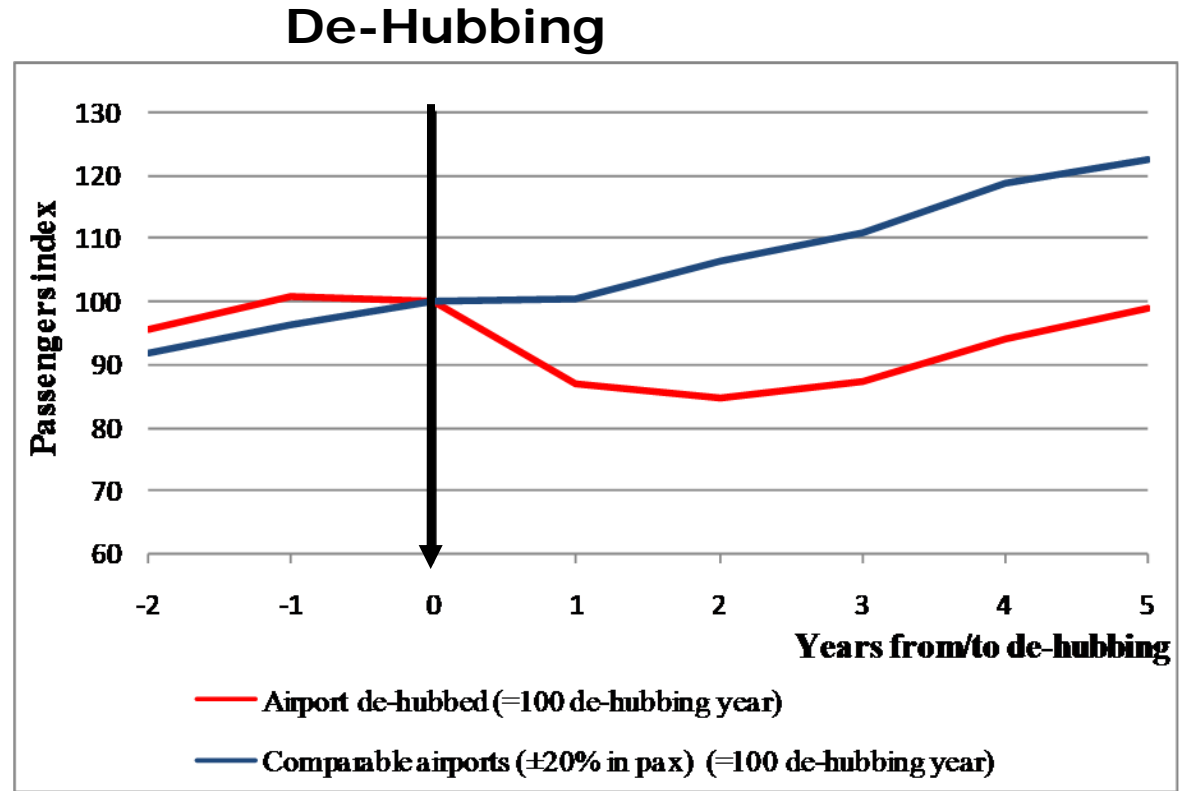
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De-Hubbing: average effect on passengers

We considered 14 de-hubbing

The average effect is the result of very different cases

We identify **5 possible scenarios** after de-hubbing takes place

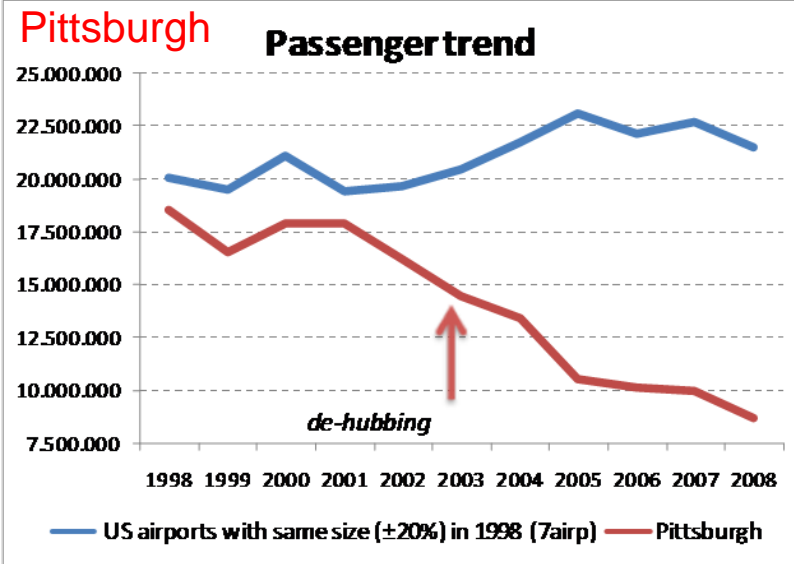


Scenario 0: DECLINE

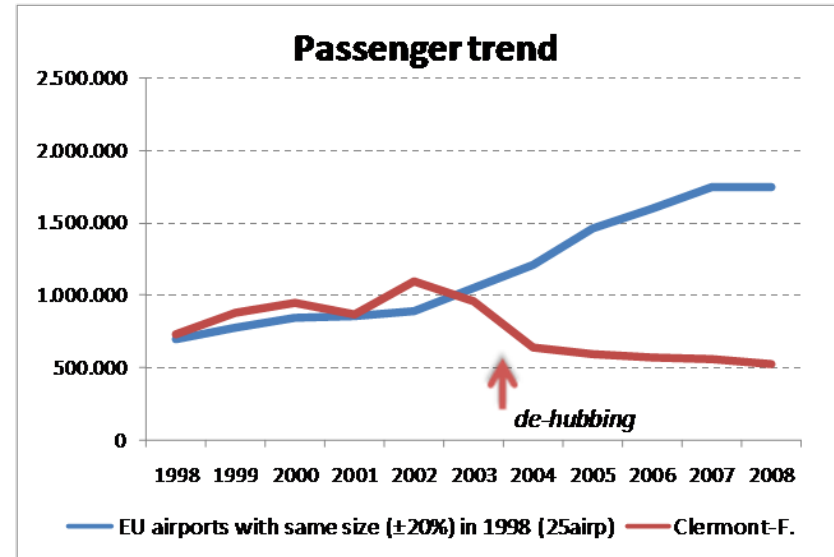
Empty capacity available after de-hubbing is not employed by other carriers



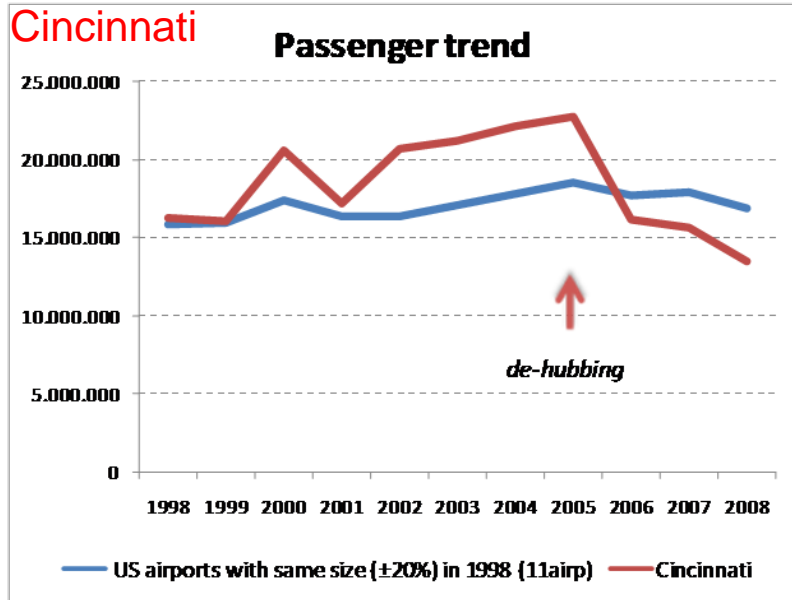
- The airline after de-hubbing is still the main carrier in the airport
- The airport declines: traffic and network quality drop with no longer-term recovery



Clermont-Ferrand



- After de-hubbing traffic decreased more than competitors



2009 capacity (week from 21st to 27th September)

Seats capacity		Airport	One world	Skyteam	Star	Low cost	Non allied network	Others
		Clermont-Ferrand CFE	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
		Pittsburgh PIT	4.7%	24.2%	40.6%	29.4%	1.2%	0.0%
		Cincinnati CVG	3.3%	90.3%	6.0%	0.4%	0.0%	0.0%

Airport	1st Carrier	% Seats	2nd Carrier	% Seats	3rd Carrier	% Seats	EX-Dominating	Share	Rank
Clermont-Ferrand	Air France	100.0%					Air France	100.0%	1
Pittsburgh	US Airways	29.1%	Southwest Airlines	19.6%	Delta Air Lines	11.0%	US Airways	29.1%	1
Cincinnati	Delta AirLines	87.4%	United Airlines	3.4%	American Airlines	3.3%	Delta Air Lines	87.4%	1

- Passengers and network quality drop
- Still possible future expansions, if the airports survive

Scenario 1: RE-HUBBING

A new airline dominates the airport offering hub connections

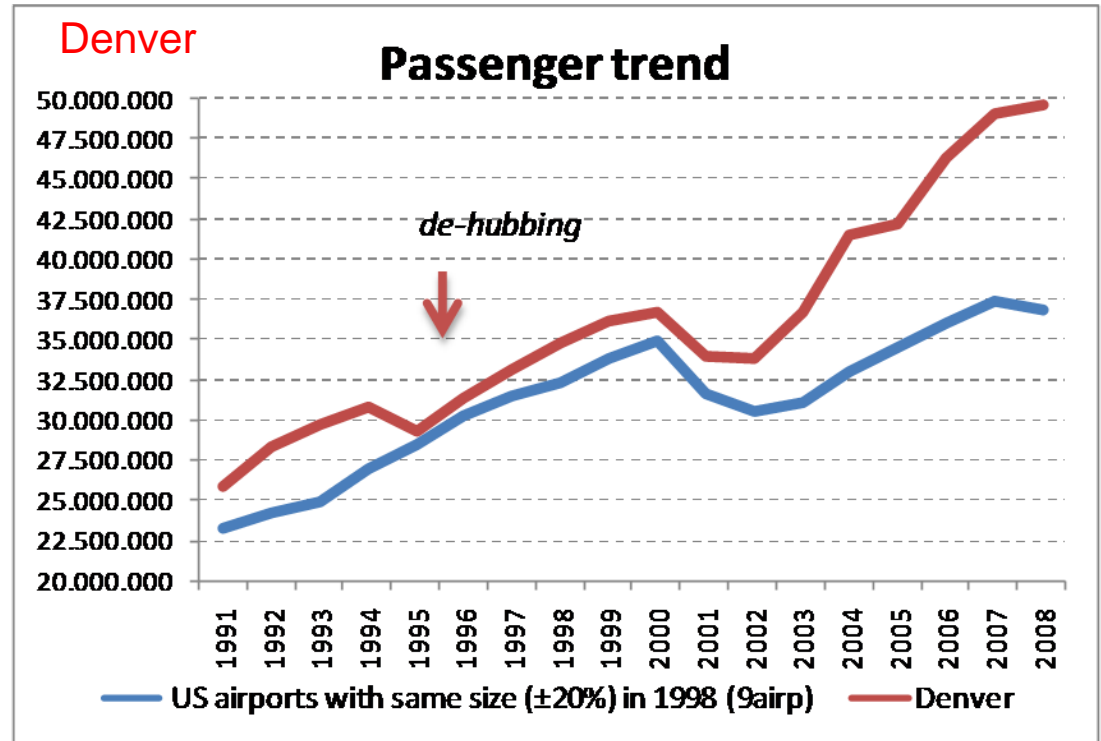


REVERSIBLE DE-HUBBING: Re-hubbing means to replace both the feeding structure and long-haul services. However:

- It is not probable that the hub airport is the optimal location for the entry airline or alliance
- It depends on the new O-D markets to be connected. If the new airline aims to serve the most of O-D markets previously operated, the probability of re-hubbing is higher
- **Not frequent solution**

Denver is the only case of successful re-hubbing

Continental is promptly replaced by United Airlines



However, it is a unique case with two different airports:

Continental left the old Denver airport

United took over the **new airport in 1994**

Denver is an optimal location to serve most of O-D between the two US coasts

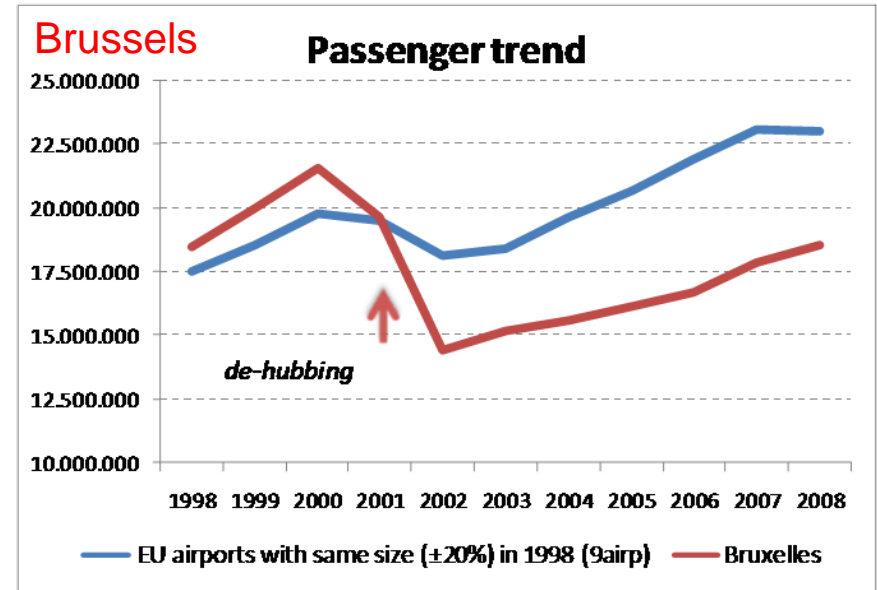
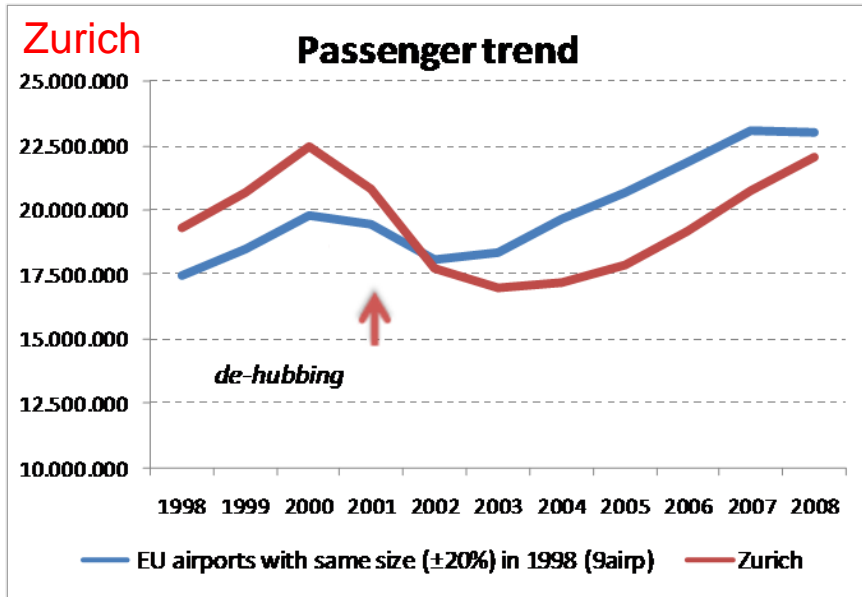
Scenario 2: CARRIER RECOVERY

De-Hubbing is the result of the Hub carrier financial problems that could lead to bankruptcy. If the carrier recovers or a new carrier takes over, the hub network quality could be maintained:

- Swissair and Swiss
- Sabena and Air Brussels (former SN Brussels Airlines)



DE-HUBBING IS REVERSIBLE



2009 capacity (week from 21st to 27th September)

Airport	1st Carrier	% Seats	2nd Carrier	% Seats	3rd Carrier	% Seats	EX-Dominating	Share	Rank
Brussels	Brussels Airlines	34.5%	Jetairfly	7.1%	Lufthansa	7.0%	Sabena	34.5%	1
Zurich	SWISS	54.6%	airberlin	7.6%	Lufthansa	4.6%	SWISSAIR	54.6%	1

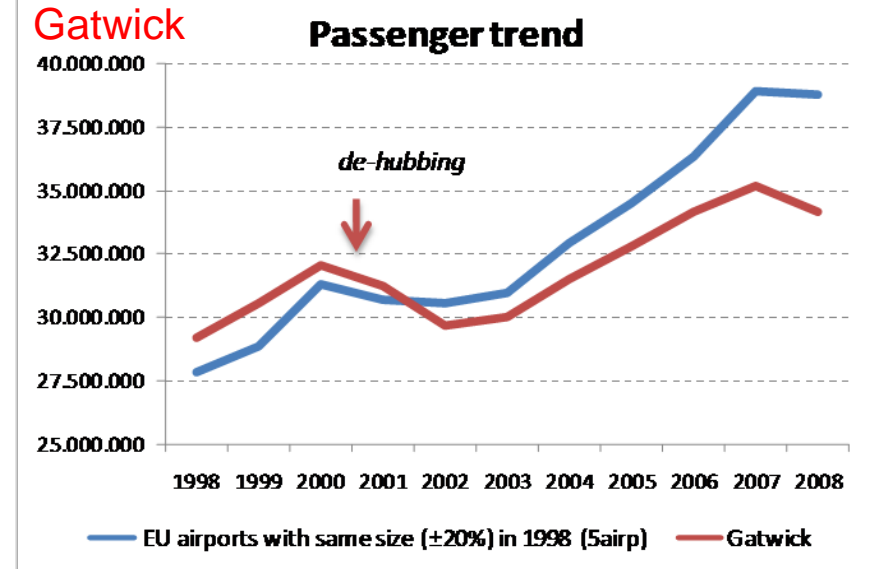
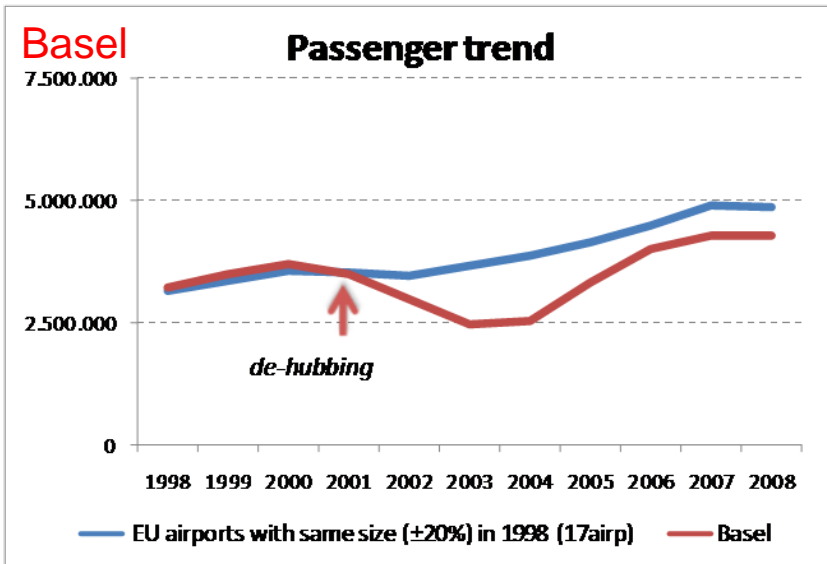
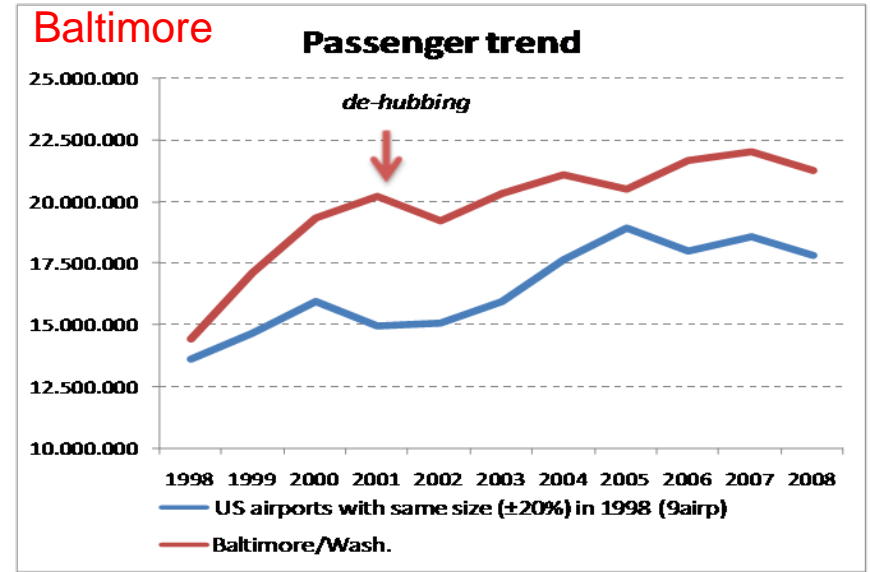
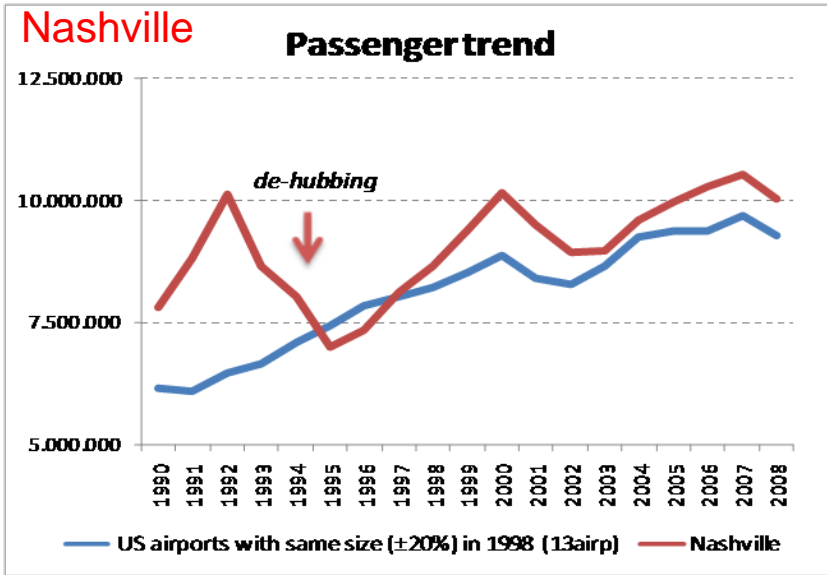
- Traffic recovery in the medium-term

Scenario 3: LOW COST ENTRANCE

Empty capacity available after de-hubbing is gradually used by low cost carriers offering point-to-point services



1. IRREVERSIBLE DE-HUBBING: the airport is dominated by point-to-point carriers offering non-networked and not co-ordinated air services. Point-to-point network make it difficult to create again a feeding structure. The only solution is self hubbing.
2. PARTIAL REVERSIBLE DE-HUBBING: keeping an area inside the airport facility for carriers operating hubbing services.



2009 capacity (week from 21st to 27th September)

Airport		One world	Skyteam	Star	Low cost	Non allied network	Others
Nashville	BNA	14.6%	17.7%	10.2%	54.5%	3.0%	0.0%
Basel	BSL	6.1%	15.5%	24.5%	51.5%	1.6%	0.7%
Baltimore	BWI	4.4%	12.3%	11.0%	71.8%	0.4%	0.0%
Gatwick	LGW	28.6%	1.3%	2.6%	53.1%	12.6%	1.8%
San Jose	SJC	12.4%	7.1%	11.1%	58.3%	11.1%	0.0%

Airport	1st Carrier	% Seats	2nd Carrier	% Seats	3rd Carrier	% Seats	EX-Dominating	Share	Rank
Nashville	Southwest	54.5%	American Airlines	14.6%	Delta Air Lines	8.4%	American Airlines	14.6%	2
Basel	Easyjet Switzerland	27.1%	Air France	15.5%	SWISS	11.4%	SWISS	11.4%	3
Baltimore	Southwest	54.5%	AirTran	16.0%	US Airways	6.4%	US Airways	6.4%	3
Gatwick	easyJet	34.0%	British Airways	22.5%	FlyBE	6.4%	British Airways	22.5%	2
San Jose	Southwest	55.6%	American Airlines	12.4%	Alaska Airlines	6.8%	American Airlines	12.4%	2

- Passengers recover
- Good network quality even if intercontinental direct services decrease

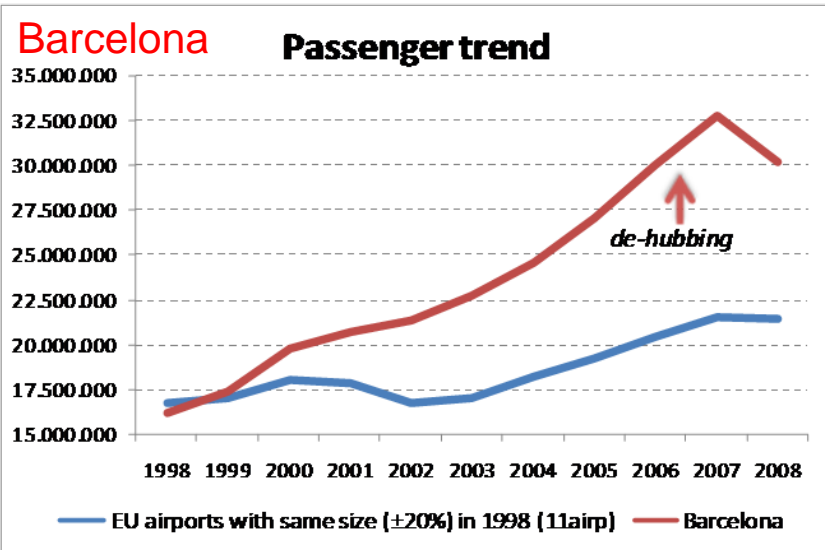
Scenario 4: BATTLEGROUNDS for ALLIANCES

Empty capacity available after de-hubbing is gradually used by carriers feeding transfer traffic to and from other hubs with their air services : the airport becomes a 'satellite airport' (downgrading)

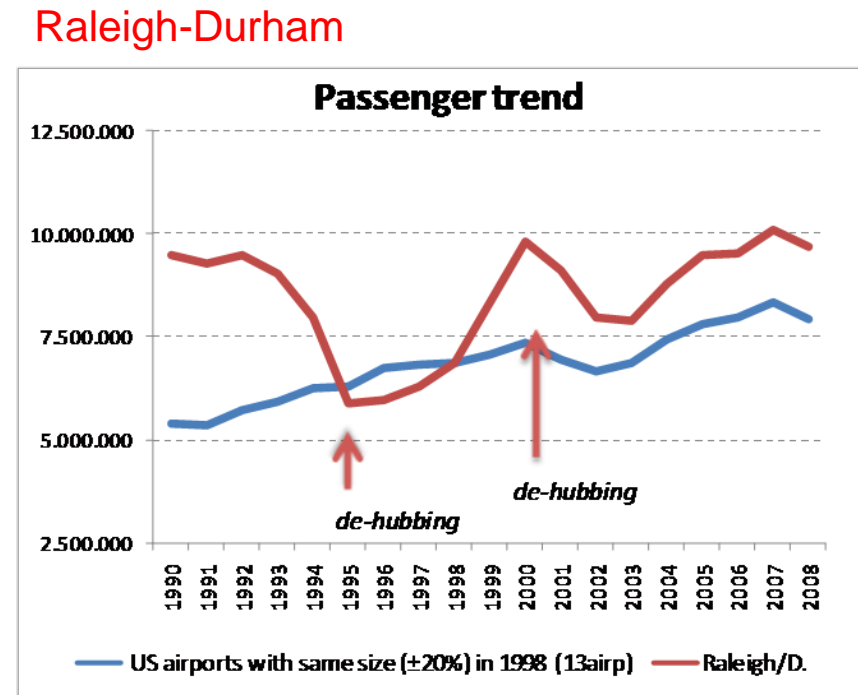
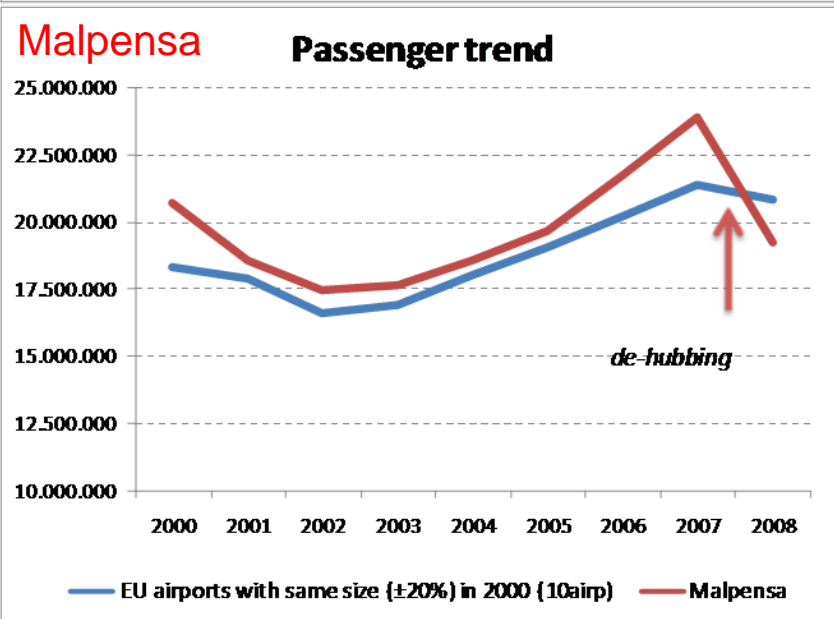
- Decreasing airport functionality
- High level of indirect competition to intercontinental destinations. Very difficult to open new direct services
- Possible presence of low-cost carriers – as in Scenario 2



REVERSIBLE DE-HUBBING IS NOT PROBABLE



- All three major alliances are present
- Significant but not majority presence of low-cost carriers



2009 capacity (week from 21st to 27th September)

Seats capacity		Airport	One world	Skyteam	Star	Low cost	Non allied network	Others
Barcelona	BCN	18.5%	13.9%	22.8%	39.2%	4.8%	0.8%	
Malpensa	MXP	6.5%	15.9%	25.2%	32.0%	18.0%	2.4%	
Raleigh-Durham	RDU	20.8%	28.7%	20.8%	29.7%	0.0%	0.0%	

Airport	1st Carrier	% Seats	2nd Carrier	% Seats	3rd Carrier	% Seats	EX-Dominating	Share	Rank
Barcelona	Clickair	15.4%	Iberia	14.7%	Spanair	12.6%	Iberia	14.7%	2
Malpensa	easyJet	24.0%	Lufthansa	15.5%	Alitalia	6.9%	Alitalia	6.9%	3
Raleigh-Durham	Southwest Airlines	22.9%	American Airlines	20.8%	Delta Air Lines	16.9%	American Airlines	20.8%	2

- High competition among alliances and low-cost carriers
- Airports can recover good network quality and benefit from low fares even if intercontinental accessibility is reduced

Which are the effects of de-hubbing?

A) The effects on passengers

- Loss of intercontinental direct services
- Not necessarily negative : there are alternative hubs and routes
- Passengers could benefit from the entry of low-cost carriers
- Distinguishing hub connectivity from passengers accessibility

B) The effects on airports

- Airports can recover traffic in the medium term
- Less direct routes to intercontinental destinations
- Very negative in the “Decline” scenario in terms of occupation

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Rank	Airport	Code	Passengers growth (%)		Accessibility (min): travel time to the main 232 worldwide destinations		HUB competition - worldwide share of O-D intermediated	
			2008	2009 (Jan-Jul)	2009	% 09-07	2009	% 09-07
1	LONDON HEATHROW	LHR	-1,49%	-3,00%	567	0,0%	33,1%	1,3%
2	PARIS CHARLES DE GAULLE	CDG	1,59%	-6,20%	580	-0,8%	31,9%	-2,7%
3	FRANKFURT	FRA	-1,28%	-7,30%	562	-0,3%	33,8%	-2,7%
4	MADRID	MAD	-2,43%	-9,60%	652	0,1%	12,6%	-2,5%
5	AMSTERDAM	AMS	-0,76%	-10,40%	578	-1,2%	29,1%	-3,8%
6	LONDON GATWICK	LGW	-2,85%	-8,80%	655	-2,2%	7,3%	-36,2%
7	ROME FIUMICINO	FCO	6,93%	-6,90%	642	0,3%	12,5%	2,7%
8	MUNICH	MUC	1,68%	-8,60%	613	-0,3%	22,8%	8,2%
9	PALMA DE MALLORCA	PMI	-1,72%	-7,20%	741	-0,9%	1,8%	-9,2%
10	BARCELONA	BCN	-8,20%	-14,20%	682	-1,3%	7,3%	-1,7%
	Average first 10 airports		-0,85%	-8,22%	627	-0,7%	19,2%	-4,7%

- Network quality deteriorates much less than passengers traffic
- **So far, the recent economic crises has not directly induced de-hubbing** among the major EU airports. So far, there seem to be minor traffic re-allocation among hubs of the same alliance. Longer terms expectations on traffic growth are still good.
- However, an economic crisis could bring airlines to permanently restructure their networks.

Conclusions

- Many EU and US hubs have been recently abandoned by the dominating carrier
- **The de-hubbing is not likely to be completely reversible.** The short-term reaction of airports, by favoring the entry of low-cost carriers and other alliances, could bring about irreversibility
- In the medium-term, the “de-hubbed” airports could recover traffic and network quality
- Intercontinental direct services decrease but, on the whole, it is not necessarily too bad for passengers
- This economic crisis has not yet directly triggered a de-hubbing process