



# From hub to hybrid?

Analysis of the de-hubbing of  
Barcelona El Prat and a future outlook

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# Airline Network Development in Europe and its Implications for Airport Planning



Guillaume Burghouwt

Available at [www.amazon.com](http://www.amazon.com)



# Outline

- **Background: de-hubbing of Barcelona**
- **Netscan connectivity model**
- **Weaknesses of hub-operation of Barcelona from a network perspective**
  1. **Weak intercontinental network**
  2. **No unique network niche**
  3. **Wave system inefficiency**
  4. **Direct hub competition by Star alliance at BCN**
  5. **Competition of low-cost hub of Air Berlin**
  6. **Cannabalization of origin-destination market by low-cost carriers**
- **Future outlook: opportunities and risks**

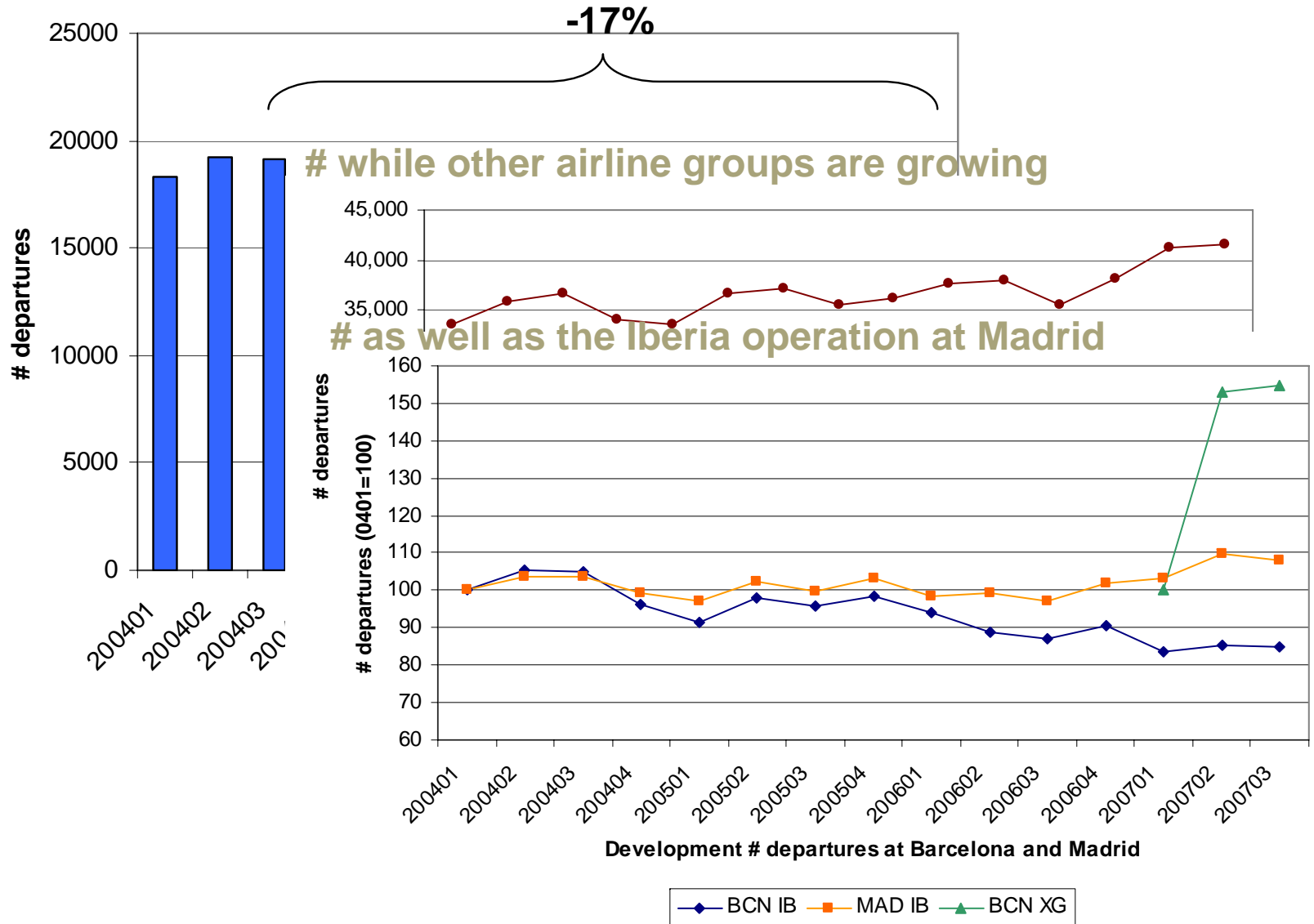


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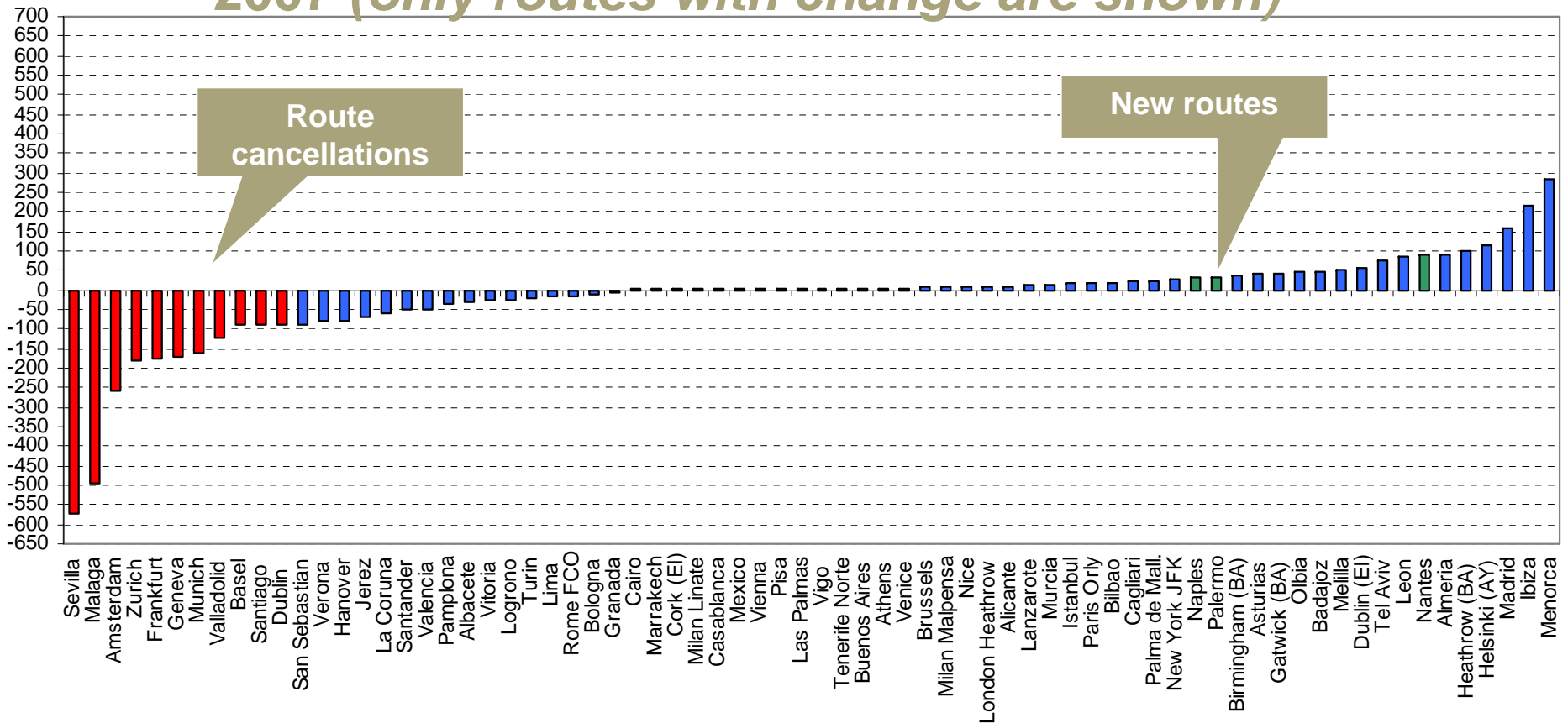
# Is El Prat really being de-hubbed?

# departures Oneworld 2004-2007 down by 17%



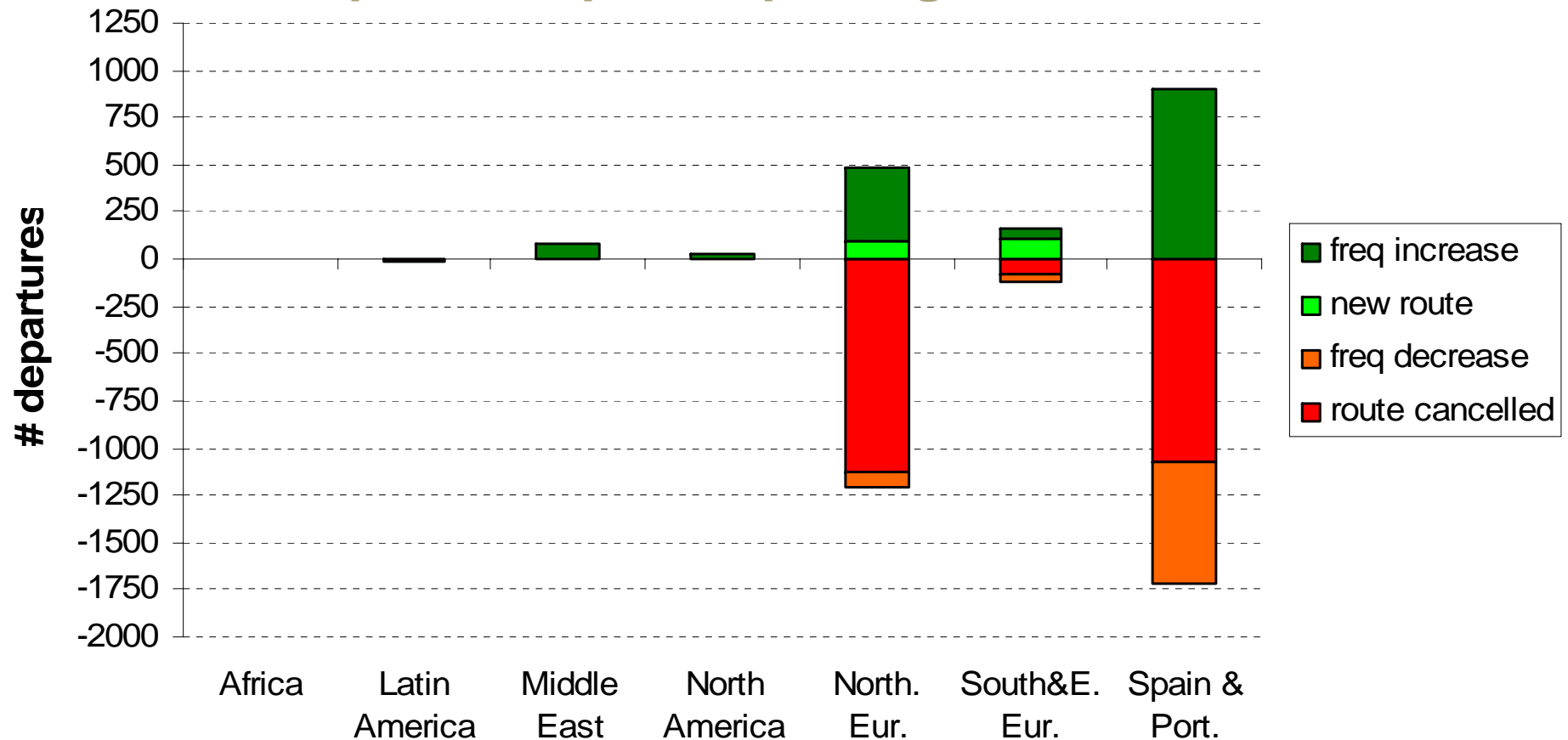
# More route cancellations than start-ups

Change in total number of Oneworld departures BCN between 1st quarter 2006 and 3rd quarter 2007 (only routes with change are shown)



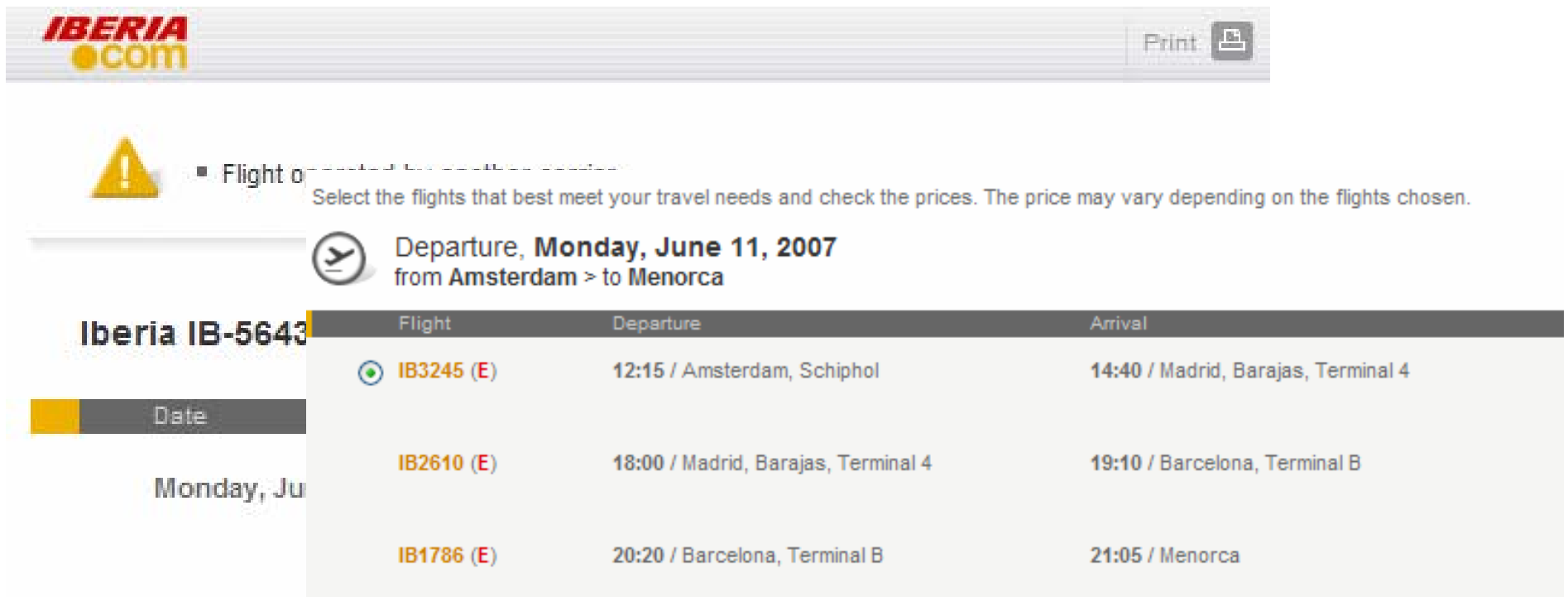
# Oneworld Network reduction Barcelona: mostly Spain & Northern Europe, consolidation Southern Europe

Change in total number of Oneworld departures BCN q1 2006- q32007 per region



# Clickair (49% ownership): simply another name for feeder operation Iberia?

Clickair operates on behalf of Iberia..



The screenshot shows the Iberia.com website interface. At the top left is the Iberia logo. On the right, there is a 'Print' button with a printer icon. Below the logo, there is a yellow warning triangle icon and a section titled 'Flight options' with a sub-header 'Departure, Monday, June 11, 2007 from Amsterdam > to Menorca'. A text box below this says 'Select the flights that best meet your travel needs and check the prices. The price may vary depending on the flights chosen.' Below this is a table of flight options. The table has columns for 'Flight', 'Departure', and 'Arrival'. The first row is highlighted with a yellow background. To the left of the table, there is a sidebar with a 'Date' dropdown menu showing 'Monday, Ju'.

Flight	Departure	Arrival
<b>IB3245 (E)</b>	12:15 / Amsterdam, Schiphol	14:40 / Madrid, Barajas, Terminal 4
<b>IB2610 (E)</b>	18:00 / Madrid, Barajas, Terminal 4	19:10 / Barcelona, Terminal B
<b>IB1786 (E)</b>	20:20 / Barcelona, Terminal B	21:05 / Menorca

but connecting passenger does not really benefit!



# BCN expansion: Midfield terminal (2007) and 3<sup>rd</sup> runway (in use)





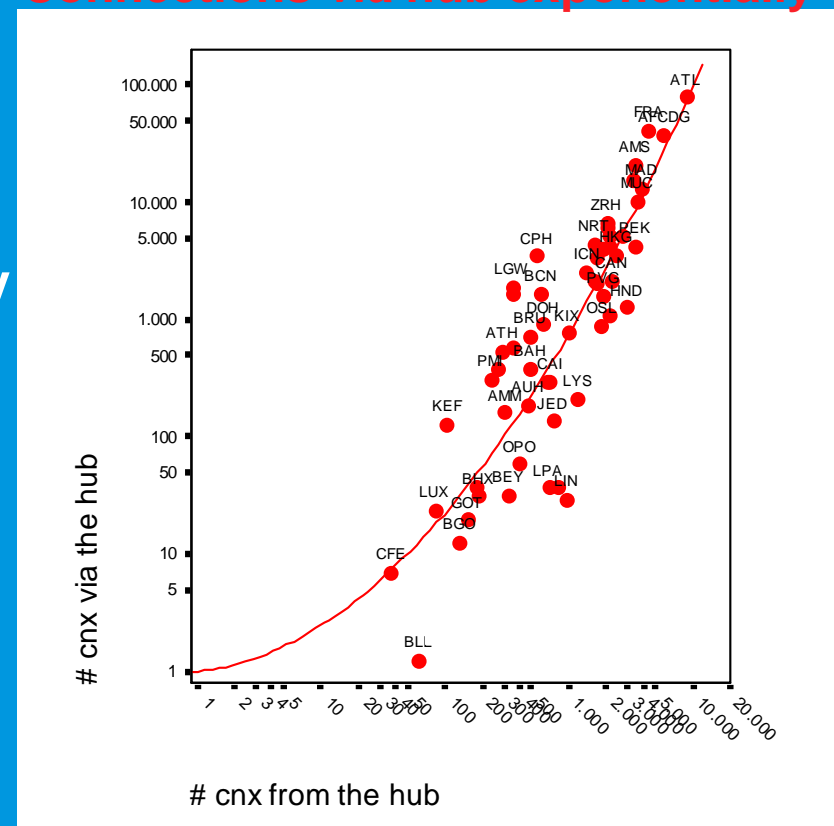
# Why is Iberia hub-operation at Barcelona not viable?

- Barcelona and Madrid part of multi-hub network of Iberia (part of Oneworld alliance)
- Multi-hub networks are not optimal from network point of view
- Only functional and profitable in certain circumstances

# Multi-hub network not optimal

- From network theory follows that concentration of services is more attractive than dispersion of services over more hubs:
  - network economies: economies of scope, scale and density favour concentration
- History shows that many secondary hubs do not survive in the long run
  - Gatwick besides Heathrow in network British Airways
  - Clermont-Ferrand in network of Air France
  - Basel in network of Swiss/ Swissair
  - Raleigh-Durham and Nashville in network American Airlines
  - Pittsburgh in network US Airlines
  - Denver in network Continental
  - Miami in network Iberia

Flights from hub grow in linear way  
Connections via hub exponentially





# Requirements for viable secondary hub in multi-hub airline network

- Hubs serve entirely different geographical markets
  - AMS-Detroit in SkyTeam network
  - Frankfurt-Chicago O'Hare
- Hubs serve more or less same continental markets:
  - Specialization in space or time
    - Space: AMS Northern Europe, Paris CDG Southern Europe
    - Time: Frankfurt and Munich have alternating hub system
  - Major capacity problems at primary hub (Frankfurt/Munich)
  - Local market large enough to sustain high-yield, long-haul services from secondary nodes
  - Bilateral restrictions at primary hub



# Are these requirements for successful secondary hubs met at El Prat as hub of Iberia?

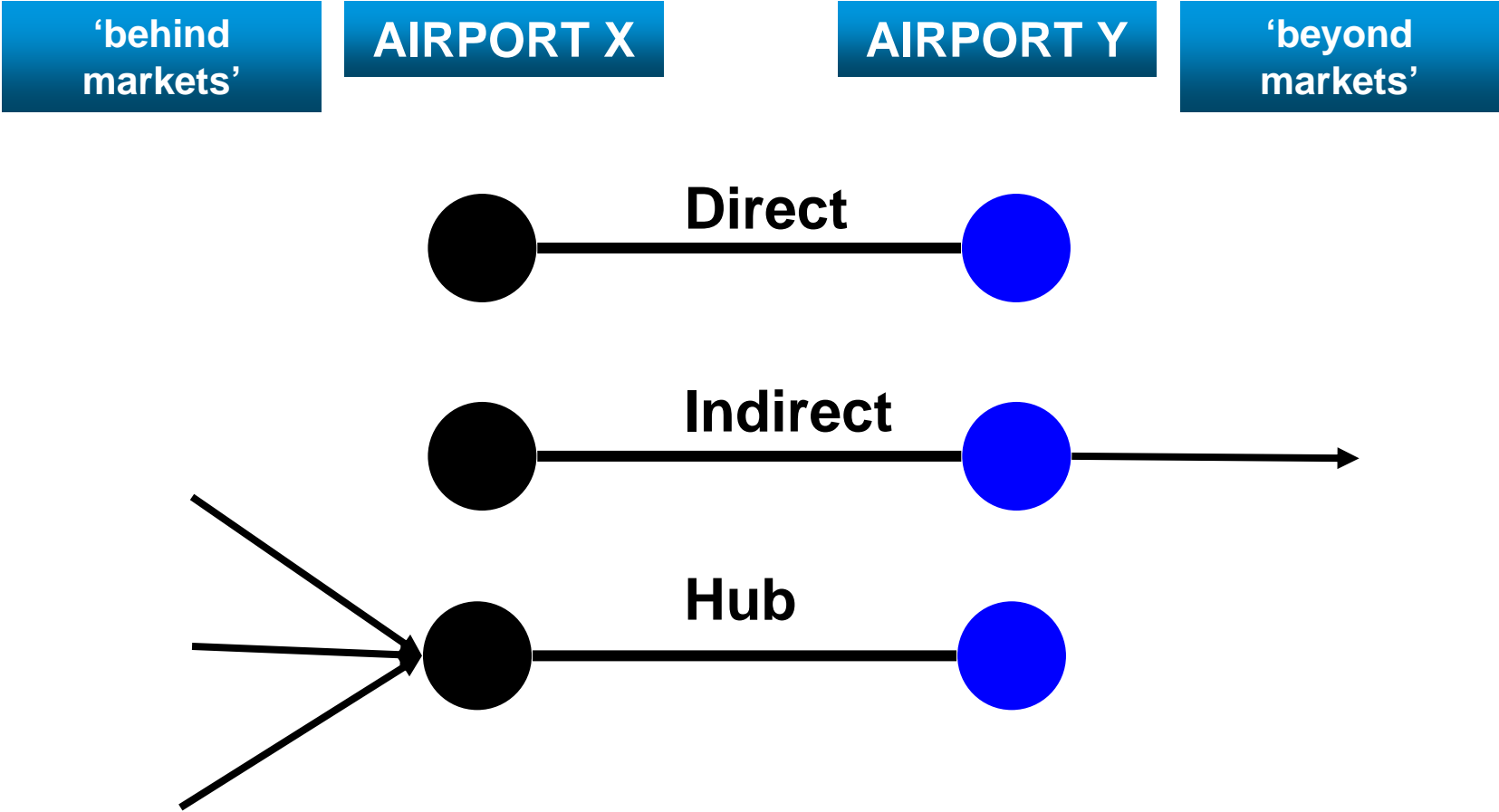
- Connectivity analysis of network of Iberia and other carriers at Barcelona and Madrid
- Netscan connectivity model used



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# 3 types of connectivity





# How to measure connectivity?

- **Netscan: measures number of connections from and via a hub and weighs them for the quality of those connections (in terms of connecting time and circuitry)**
- **Uses OAG flight schedules**
- **Expresses connectivity in one indicator: CoNnectivity Units or CNU's (1 direct frequency=1 CNU)**

# Example: connectivity Amsterdam-San Fransisco

origin	hub	destination	alliance	Frequency	Quality	CNU	Avg. cnx time (min)	Circuitry factor (%)
AMS	DIRECT	SFO	SKY TEAM	7	1.0	7.0	0	0
	CDG		SKY TEAM	21	0.6	12.4	100	7
	LHR		ONEWORLD	27	0.4	10.8	168	2
	IAH		SKY TEAM	29	0.4	10.3	108	22
	FRA		STAR	21	0.5	10.2	122	8
	LHR		STAR	25	0.3	7.7	141	6
	MSP		SKY TEAM	21	0.4	7.4	154	5
	JFK		SKY TEAM	14	0.5	6.4	63	14
	MUC		STAR	21	0.3	6.0	126	20
	IAD		STAR	14	0.4	5.1	127	15
	DEN		STAR	21	0.2	4.9	115	10
	EWR		SKY TEAM	28	0.2	4.3	160	14
	ORD		STAR	14	0.3	3.9	168	9
	DTW		SKY TEAM	7	0.5	3.7	75	10
	ATL		SKY TEAM	14	0.2	2.3	180	20
	PHL		STAR	7	0.3	2.1	140	14
	CVG		SKY TEAM	7	0.3	2.0	160	13
	FCO		SKY TEAM	7	0.1	0.8	50	40
	LAX		STAR	7	0.1	0.6	118	19
	KEF		NON-ALLIANCE	1	0.5	0.5	120	0
	CLT		STAR	1	0.1	0.1	101	18
Total				314	0.3	108.4	129	11

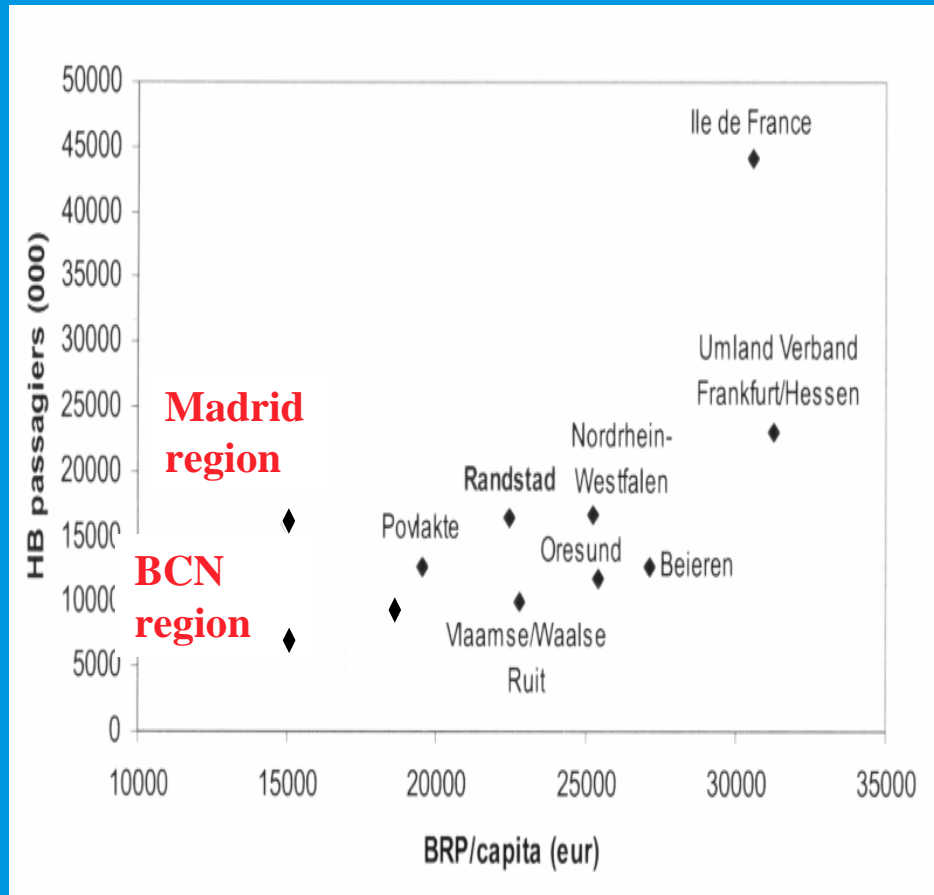


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# Problem 1: small OD market BCN

- Relatively small OD market BCN
  - Does not support many intercontinental destination by its own local market
- MAD OD market larger
- Worthwhile consolidating at one hub: network economy gains > loss local (premium) passenger demand

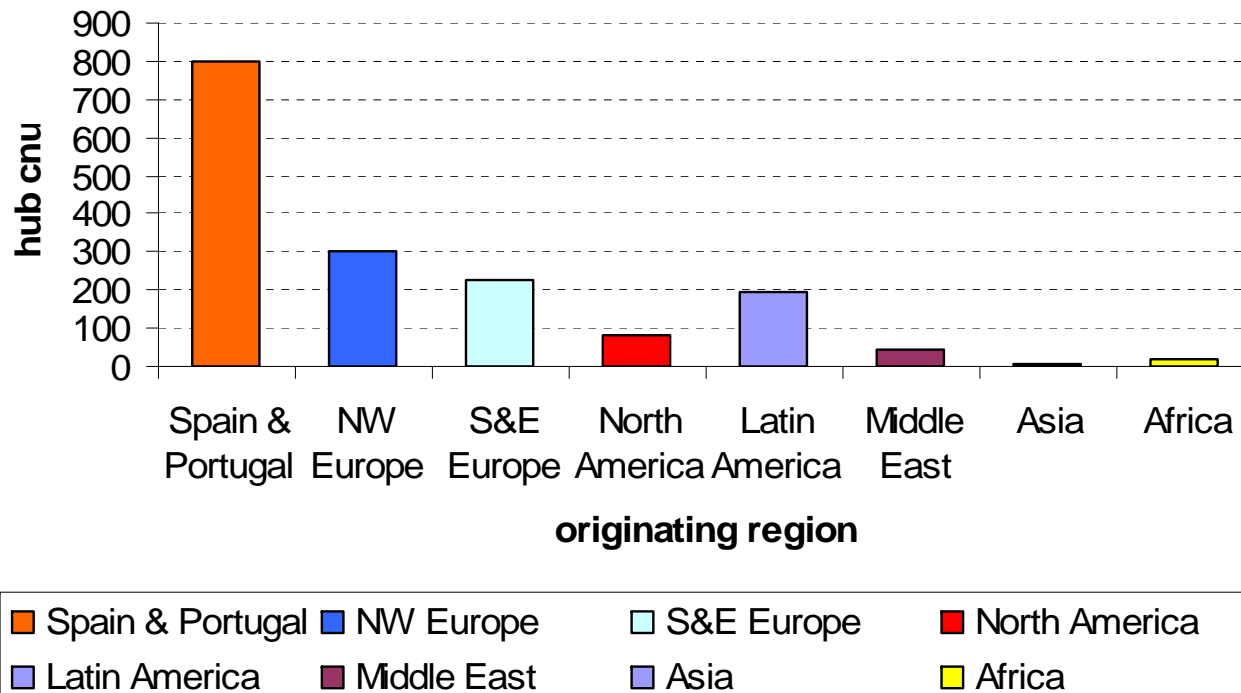




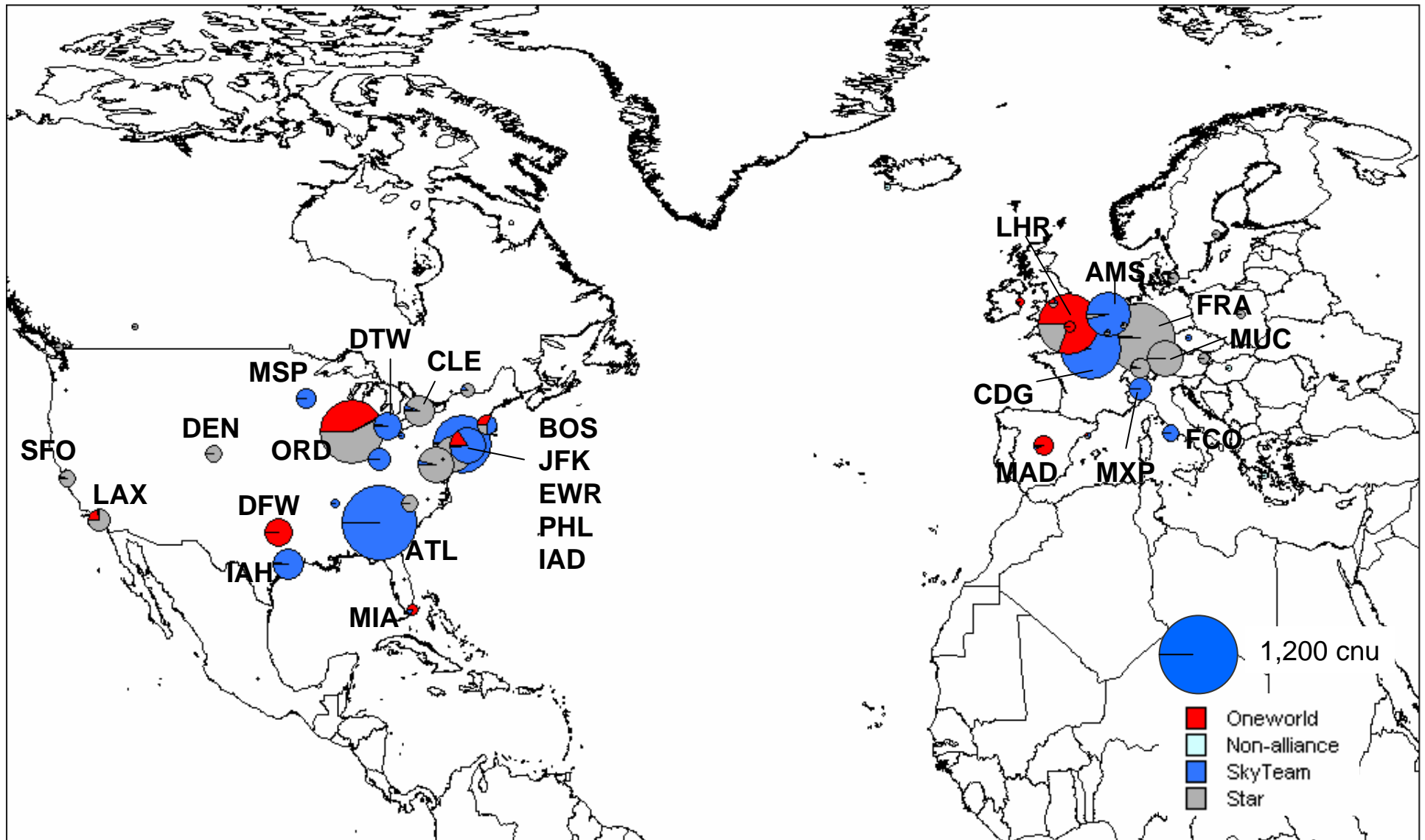
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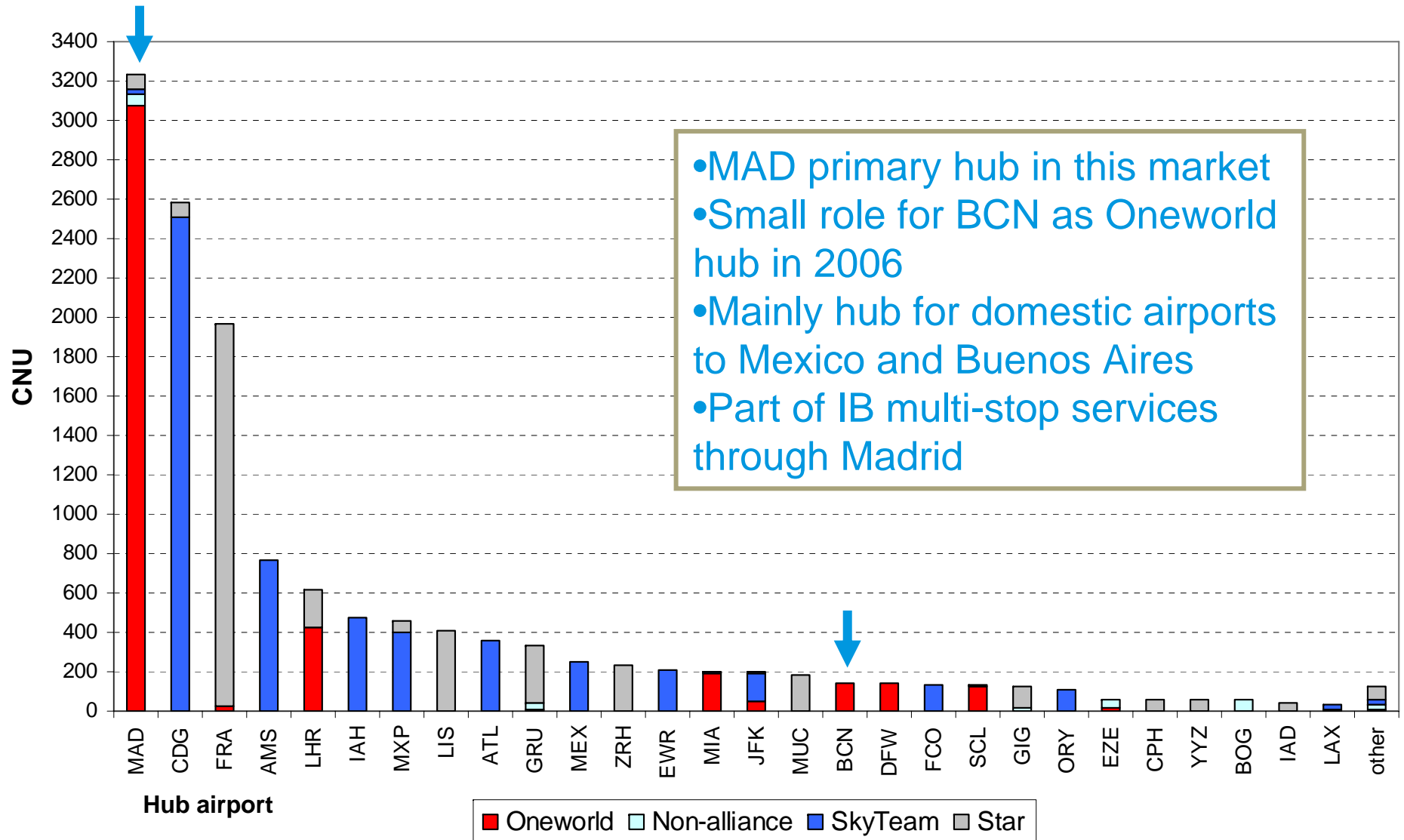
# Problem 2: weak intercontinental network



# Example: hub connectivity 2006 Europe-North America

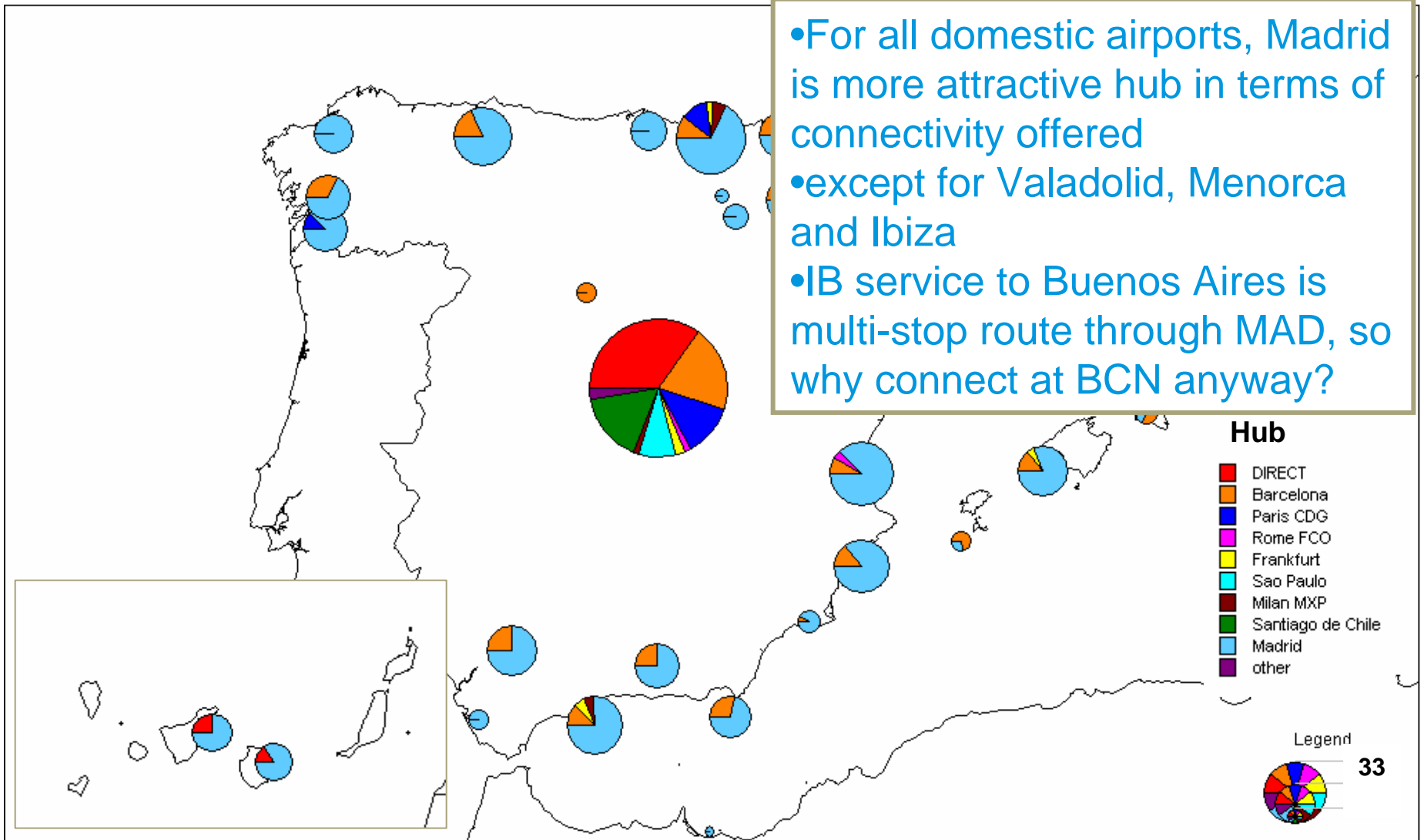


# Example: hub connectivity Europe-Latin America via..



# Domestic airports to Buenos Aires via...

- For all domestic airports, Madrid is more attractive hub in terms of connectivity offered
- except for Valladolid, Menorca and Ibiza
- IB service to Buenos Aires is multi-stop route through MAD, so why connect at BCN anyway?

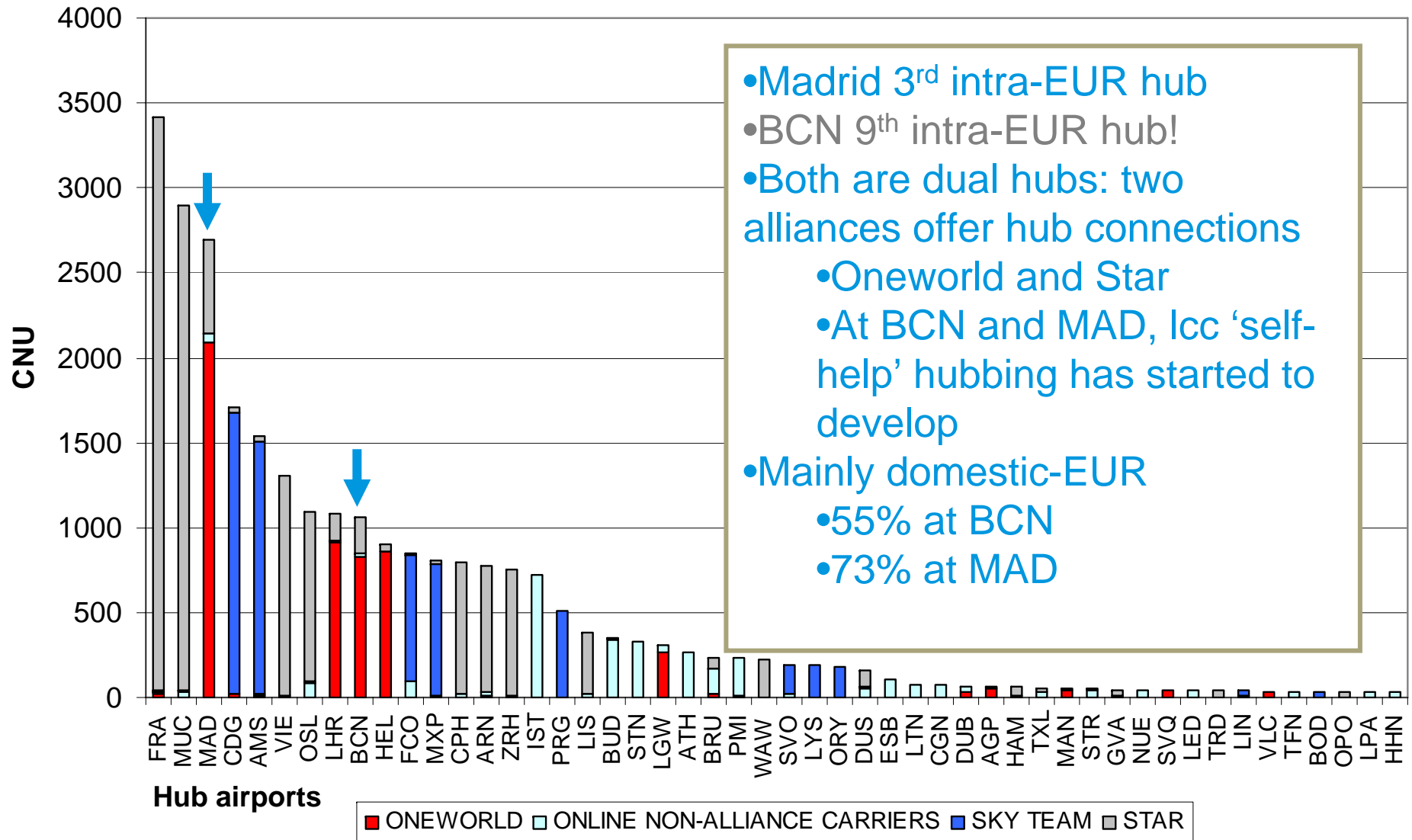




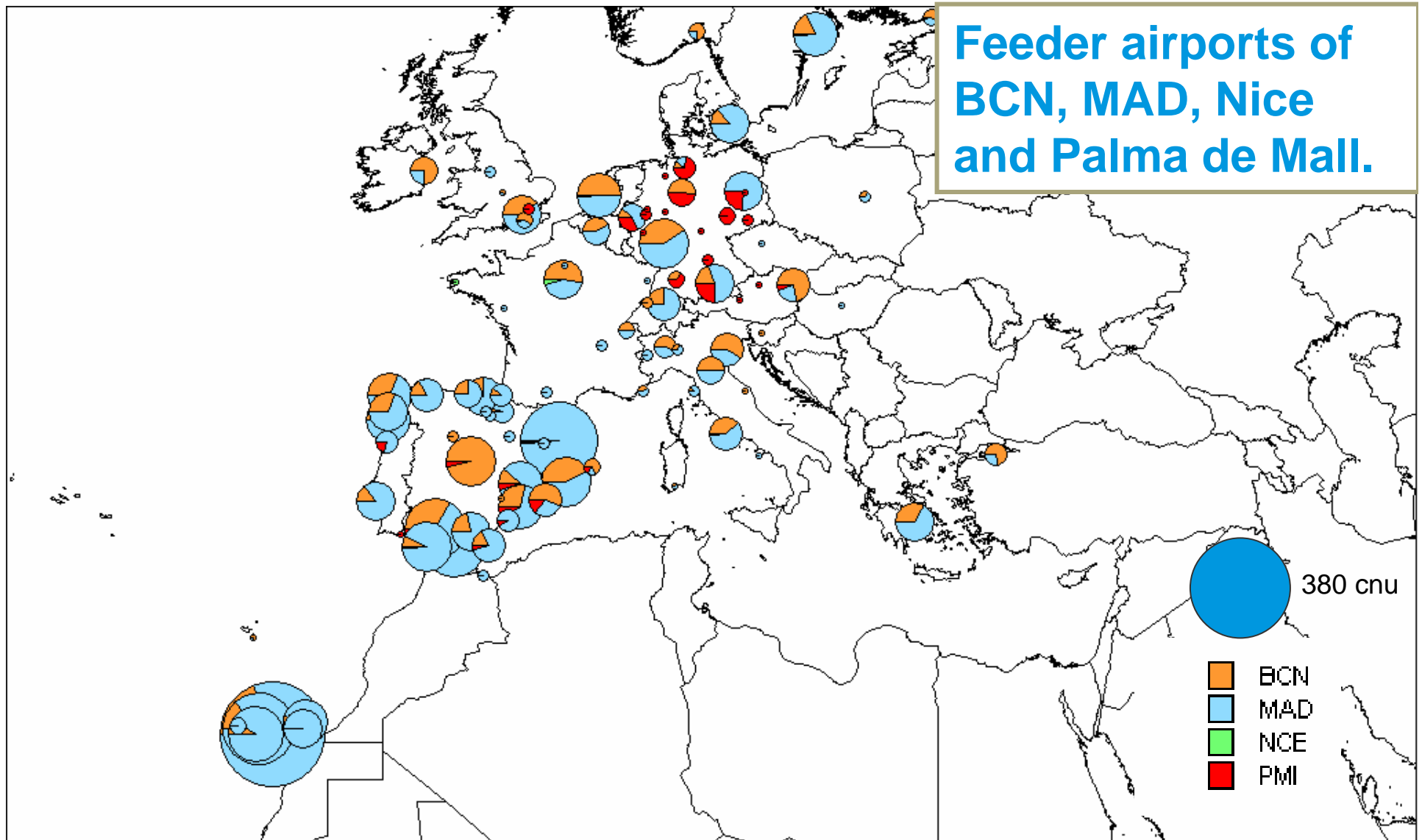
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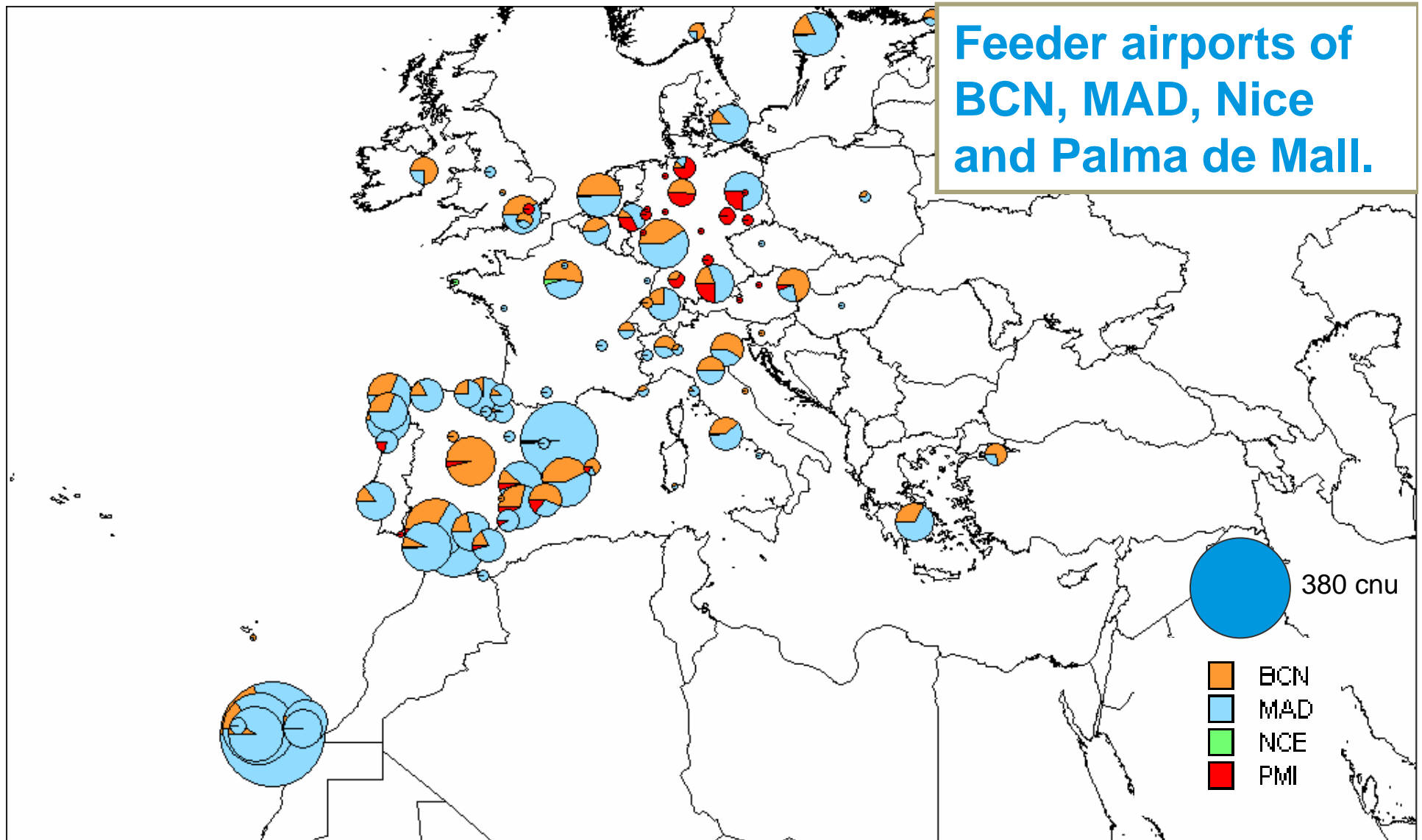
# Hub connectivity intra-Europe via..



# Intra-European hub connectivity per feeder airport via BCN and nearby competitors (MAD, PMI ,Nice)



# Problem 3: major duplication on European feeder routes with Madrid





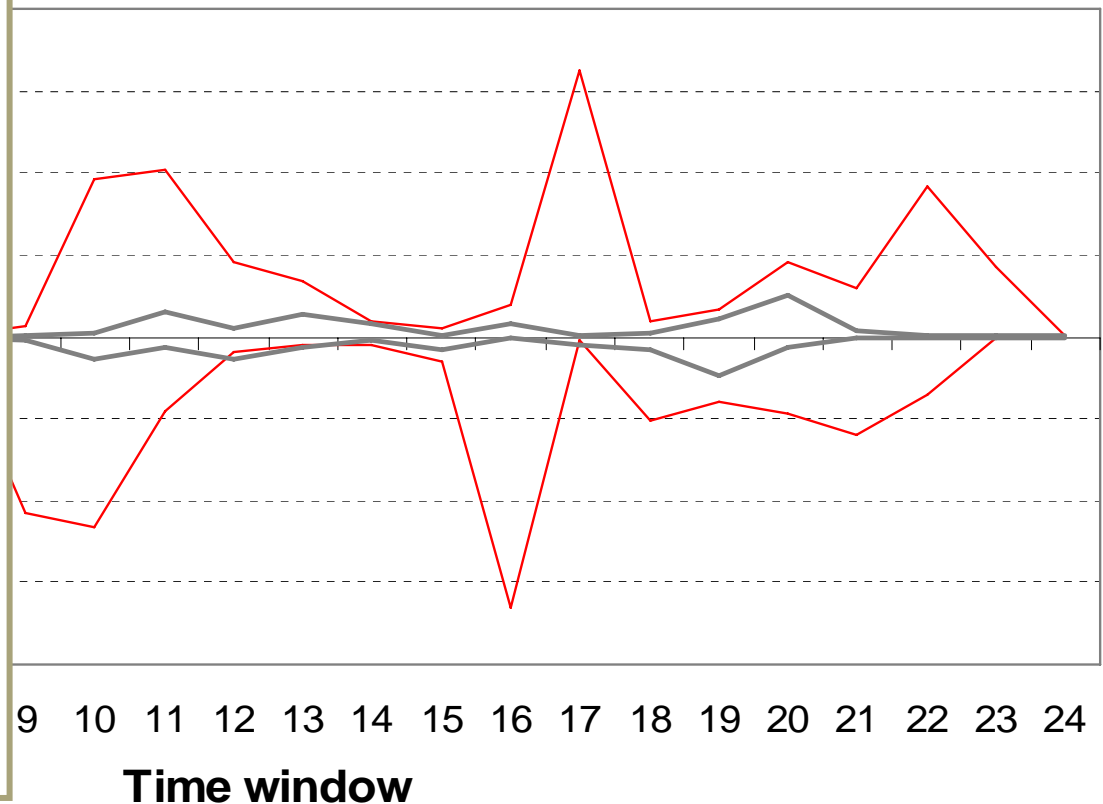
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# Problem 4: wave system inefficiency

## Hub connectivity per arrival and departure time window at Barcelona El Prat, 2006

- 3/4 connection waves
  - During middle of the day 2 main waves
  - Only domestic destinations served in each wave
- Most hubs have >4 waves
- BCN frequencies not competitive outside domestic market
- Business community demands frequencies at edges of the day
  - Early morning
  - Evening



— Oneworld arr. — Star arr. — Oneworld dep. — Star dep.



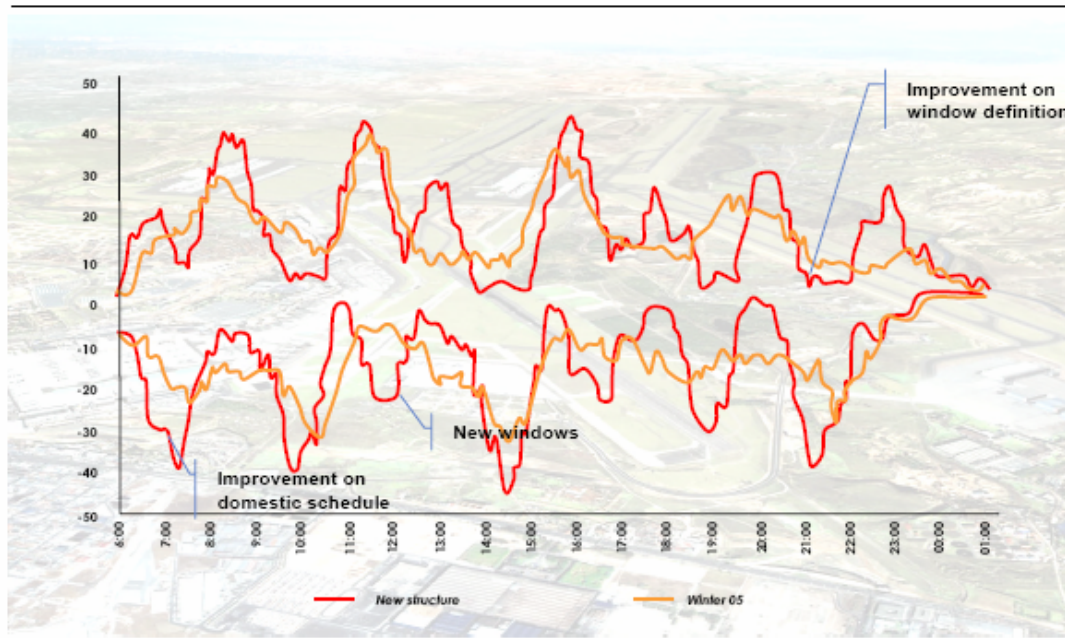
## Mr. Bolorinos Cremades, network manager Iberia in 2003:

*We have a wave in the middle of the day at Barcelona that we have to live with. This doesn't make sense [..]. You don't have a good product for the local market. [..] The local market does not want a 10 o'clock flight. They want to leave before 9 and they want to return in the afternoon.*

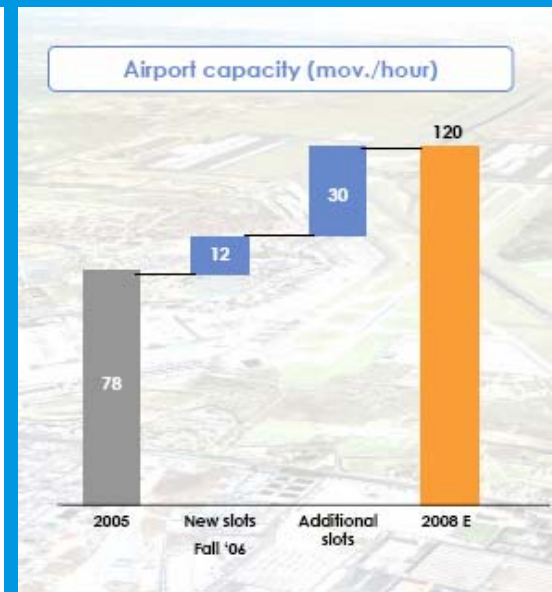
*If you can't provide that, you lose your local market. And if you lose market share in the local market, the economics of hubs don't work*

# Expansion Barajas allowed Iberia to implement effective single hub operation

Hub redesign planning for Iberia at Barajas Airport



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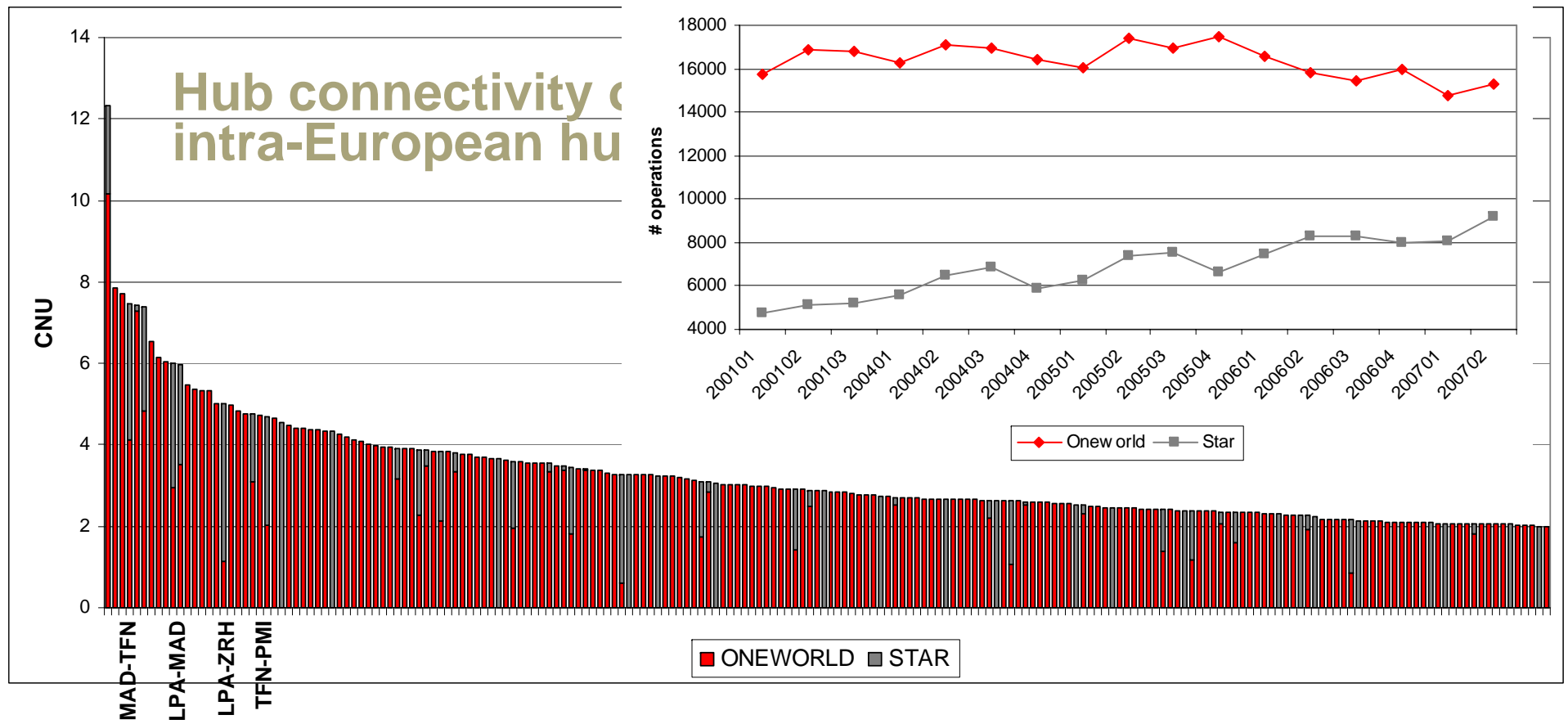




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# Problem 5: direct hub competition by secondary Eurohub of Star alliance (small but growing)

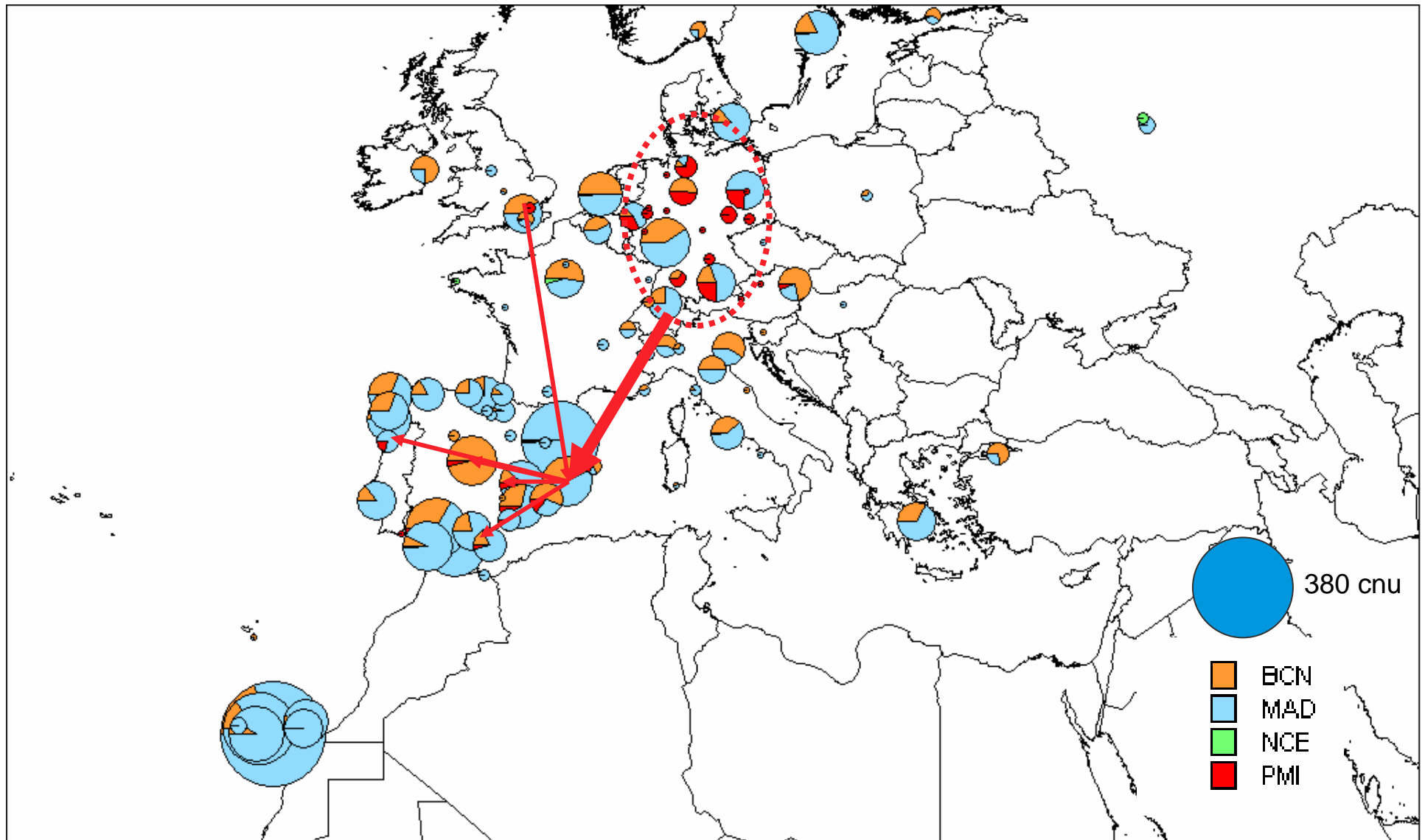




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# Problem 6: competition of nearby low-cost hub of Air Berlin at Palma

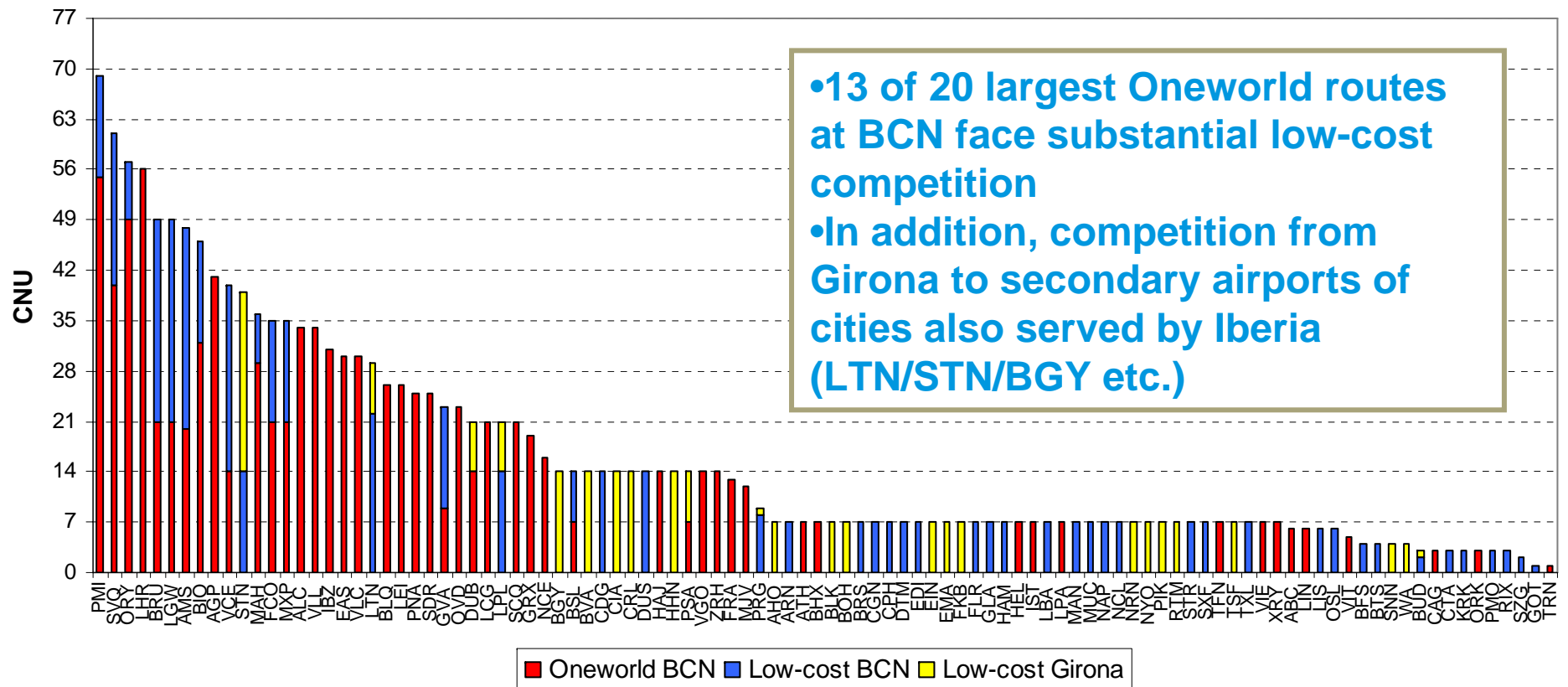




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# Low-cost competition at Oneworld routes from BCN (2006)





## In short: competitive position of BCN as a hub (2006)

1. Small OD market
2. Weak intercontinental network
3. Major duplication between MAD and BCN on European feeder routes
4. Wave-system of IB at BCN: 2 waves during middle of the day
5. Dual hub: competition of 2nd Euro hub operation at BCN (Star alliance)
6. Nearby hub competition of low-cost Euro hub of Air Berlin at Palma de Mallorca
7. Cannibalization of OD market due to huge success of Barcelona/ Girona as a low-cost carrier destination and home base lcc's

## Requirements of BCN as secondary hub in multi-hub network Iberia met?

Specialization in space?	No	Major duplication with Madrid of both short-haul and long-haul destinations
Specialization in time: alternating hub systems?	No	Double-use system with Madrid
Major capacity constraints at primary hub?	No	Recently major expansion of capacity at Madrid
Capacity available at secondary hub?	Yes	Expansion of El Prat
Local market large enough?	No	Relatively small OD market. OD Prominence of Madrid on most routes
Bilateral constraints	No	US open aviation area, EU deregulation



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# Future outlook: opportunities

## Hybrid airport:

- Full-service feeder services to major intercontinental hubs (inside/outside Europe)
  - Impact of EU/US open aviation area
- Direct low-cost services to European destinations (and long-haul in the future?)/ 'self-help hubbing'
- **Hub-building Star alliance**
  - New terminal and parallel runway unique opportunity for Star hub in Southern Europe
  - Ready earlier than new Lisbon airport (TAP is Star member)
  - Much better located than Lisbon
  - But Star already has many hubs in Europe, be it almost none in Southern Europe
  - For time being, no intercontinental Spanair services from BCN
    - **BCN mostly feeder airport for Star**
    - **BCN will depend on ICA Star alliance services (SIA, UA) for intercontinental hub operation.**
- **New intercontinental hub-carrier from Middle or Far East?**



# Future outlook: risks

- BCN de-hubbed by Iberia
- Star discontinues hub-building
- Risk: white elephant?
- Major chunk of high-quality airport capacity on the market soon (parallel runway, Midfield terminal)
  - Overcapacity
  - Negative media attention (the Mirabel-effect)
  - Higher unit costs, higher charges
  - Mismatch between demand for (low-cost) and supply of (full-service) airport capacity
    - Stansted phenomenon



# Lessons for the future

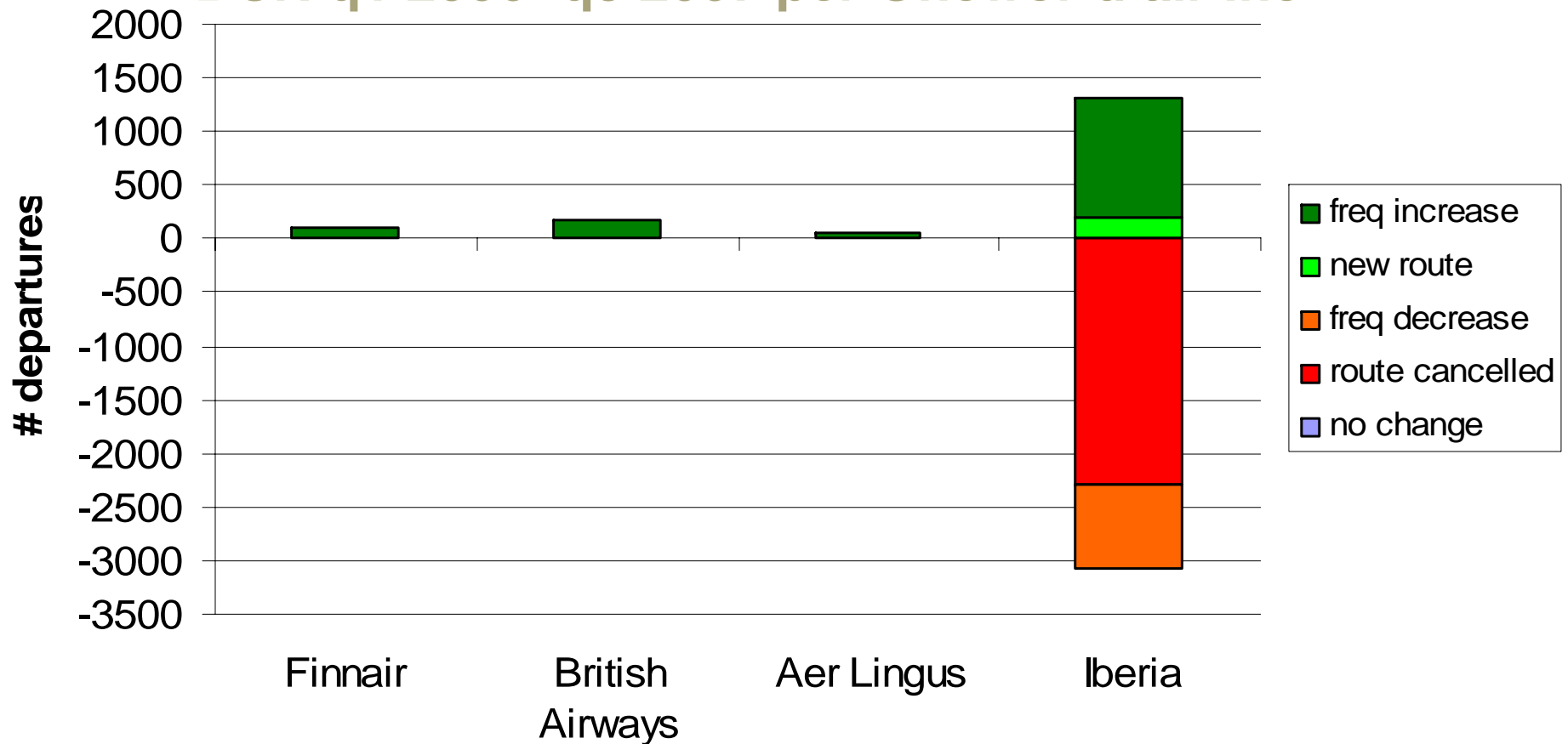
- Flexible planning process
- Take into account various future scenario's in airport planning
  - Network strategy of Iberia not very unexpected
- Make your master plan robust for these scenarios
- No big bet investments
- Plan incrementally
- Only first phase commitments



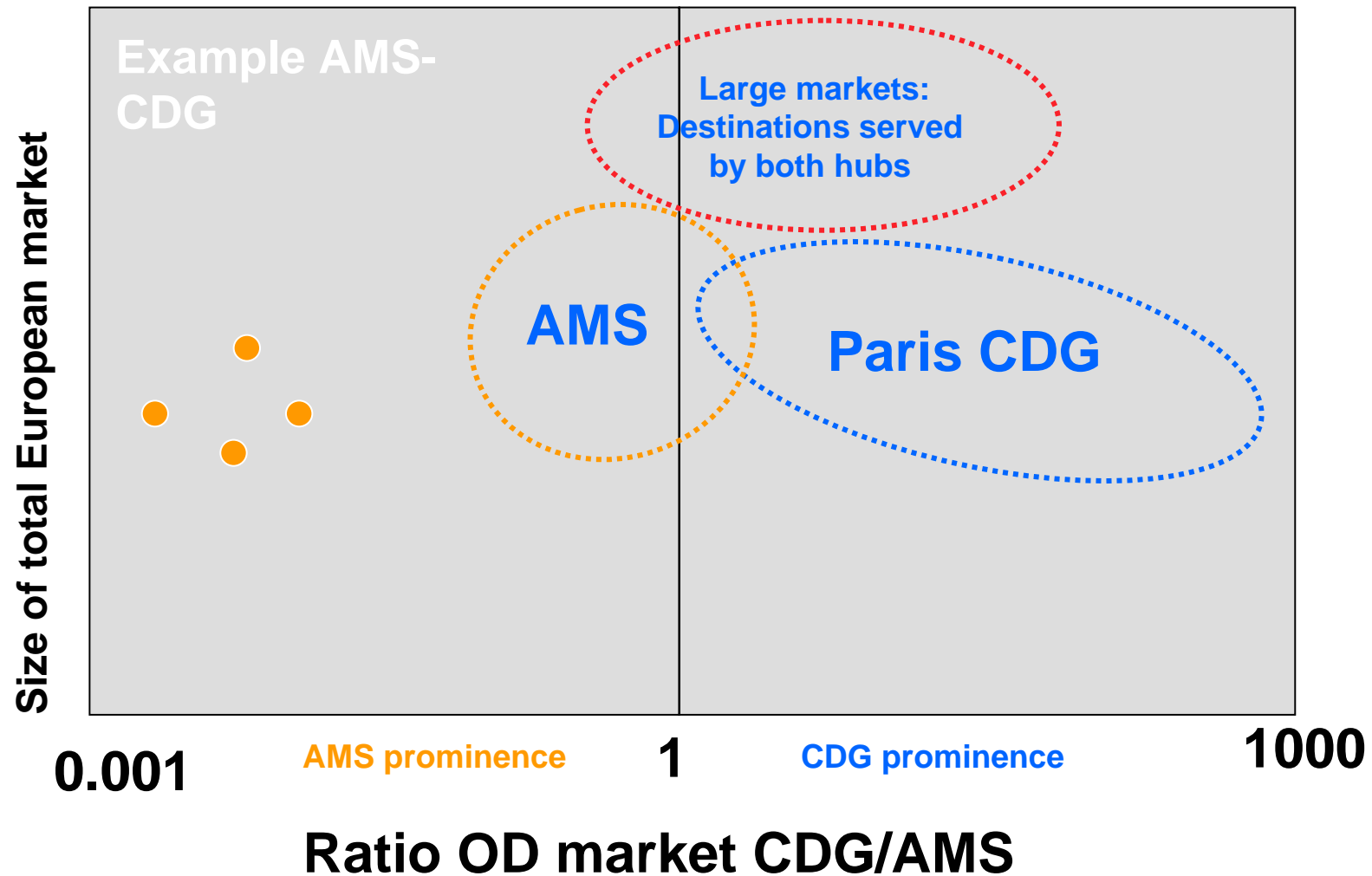
# Back-up slides

# Iberia retreats, Oneworld partners grow modestly

Change in total number of Oneworld departures BCN q1 2006- q3 2007 per Oneworld airline

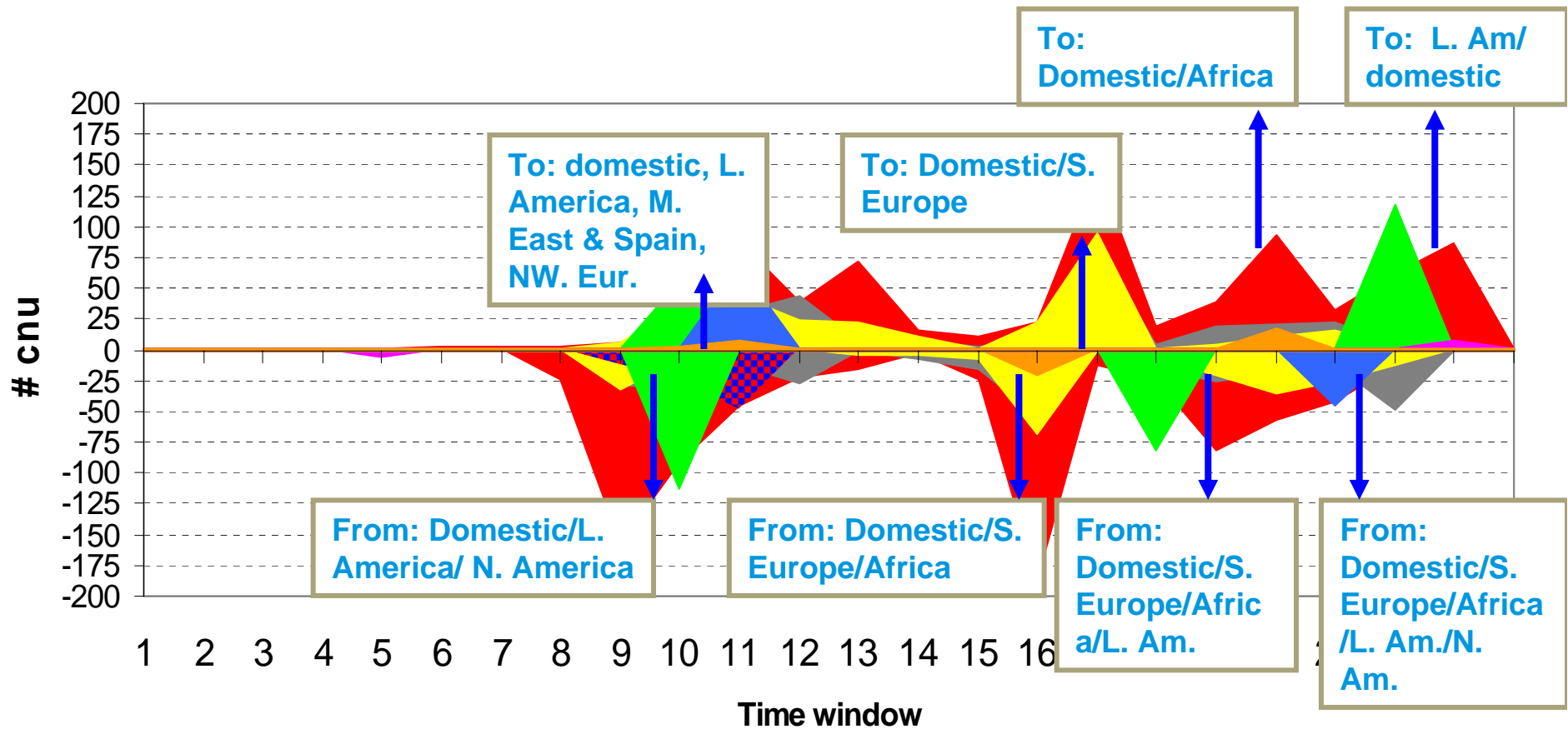


# Importance of strong OD market in multi-hub system for intercontinental destinations





# Hub connectivity per arrival and departure time window at Barcelona El Prat, 2006



- |                            |                      |                       |                     |
|----------------------------|----------------------|-----------------------|---------------------|
| ■ Spain & Port. Arrivals   | ■ NW Eur. Arrivals   | ■ S&E Eur. Arrivals   | ■ N. Am. Arrivals   |
| ■ L. Am. Arrivals          | ■ M. East arrivals   | ■ Asia arrivals       | ■ Africa arrivals   |
| ■ Spain & Port. Departures | ■ NW Eur. Departures | ■ S&E Eur. Departures | ■ N. Am. Departures |
| ■ L. Am. Departures        | ■ M. East departures | ■ Asia departures     | ■ Africa departures |