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Airline strategies to meet future environmental challenges: ETS allowance costs

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Airline strategic responses to ETS allowance costs

- ETS implications in terms of allowance costs
- Airline strategic responses
- Aircraft size versus fuel and emissions efficiency
- Use of larger aircraft: frequency implications
- Lufthansa case study
- Conclusions

ETS aviation implications

- **In first years, need to buy 25% of annual allowance at auction and more in the market**
- **Auction price close to market price:**

  Range: €10-30 per tonne CO_2 in past but may increase

- **Longer term likely to have to buy larger share of allowance:**

  Larger share auctioned

  Lower cap and larger difference between cap and actual operations

Strategic response:

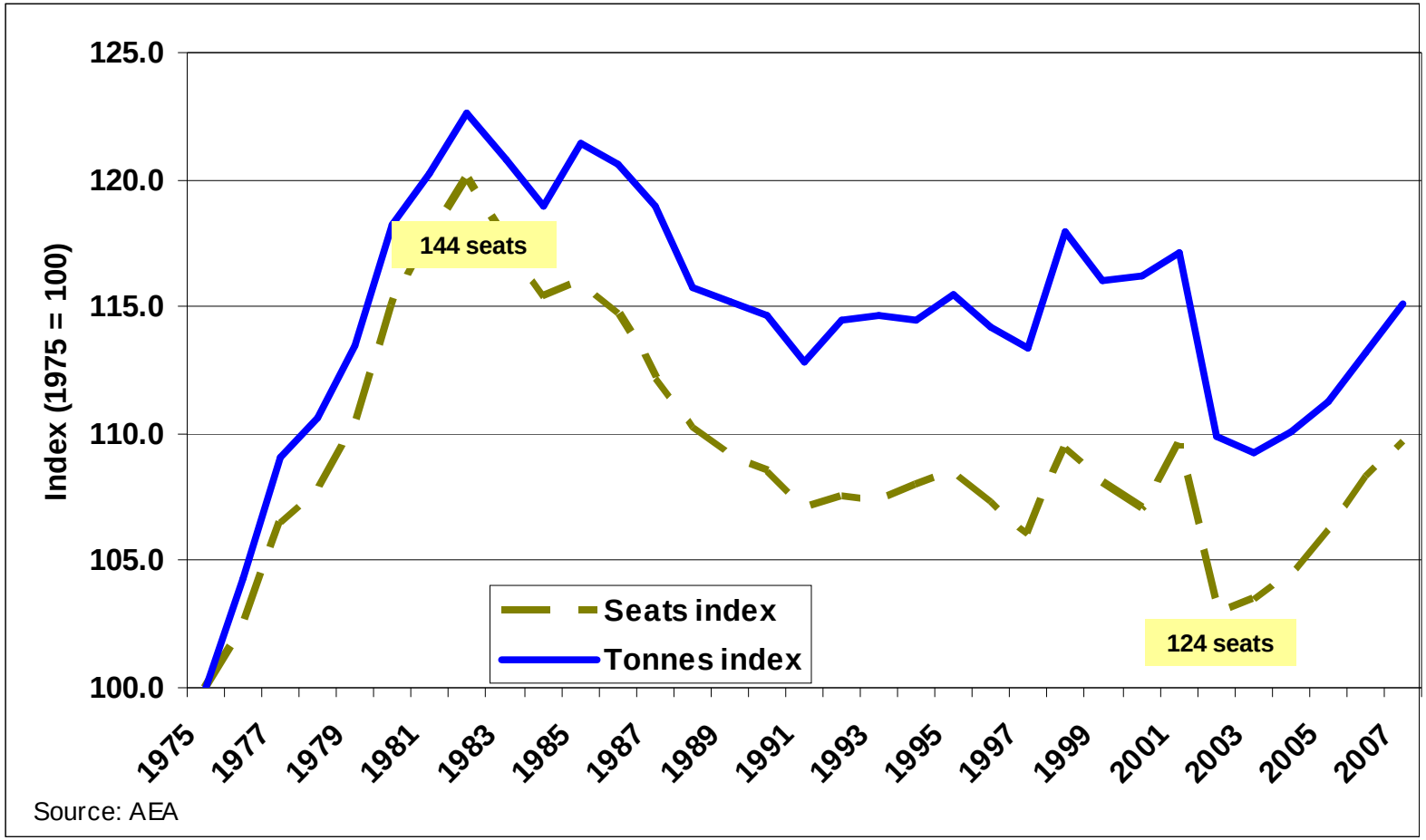
Produce more RTKs per fuel used or CO_2 emitted

- Fly longer sectors: market potential?
- More tonnes carried per flight: higher load factors or more seats per aircraft?
- Use aircraft more efficiently (operations, ATC etc)
- Use more efficient aircraft (new technology)
- Use slower aircraft
- Use larger aircraft

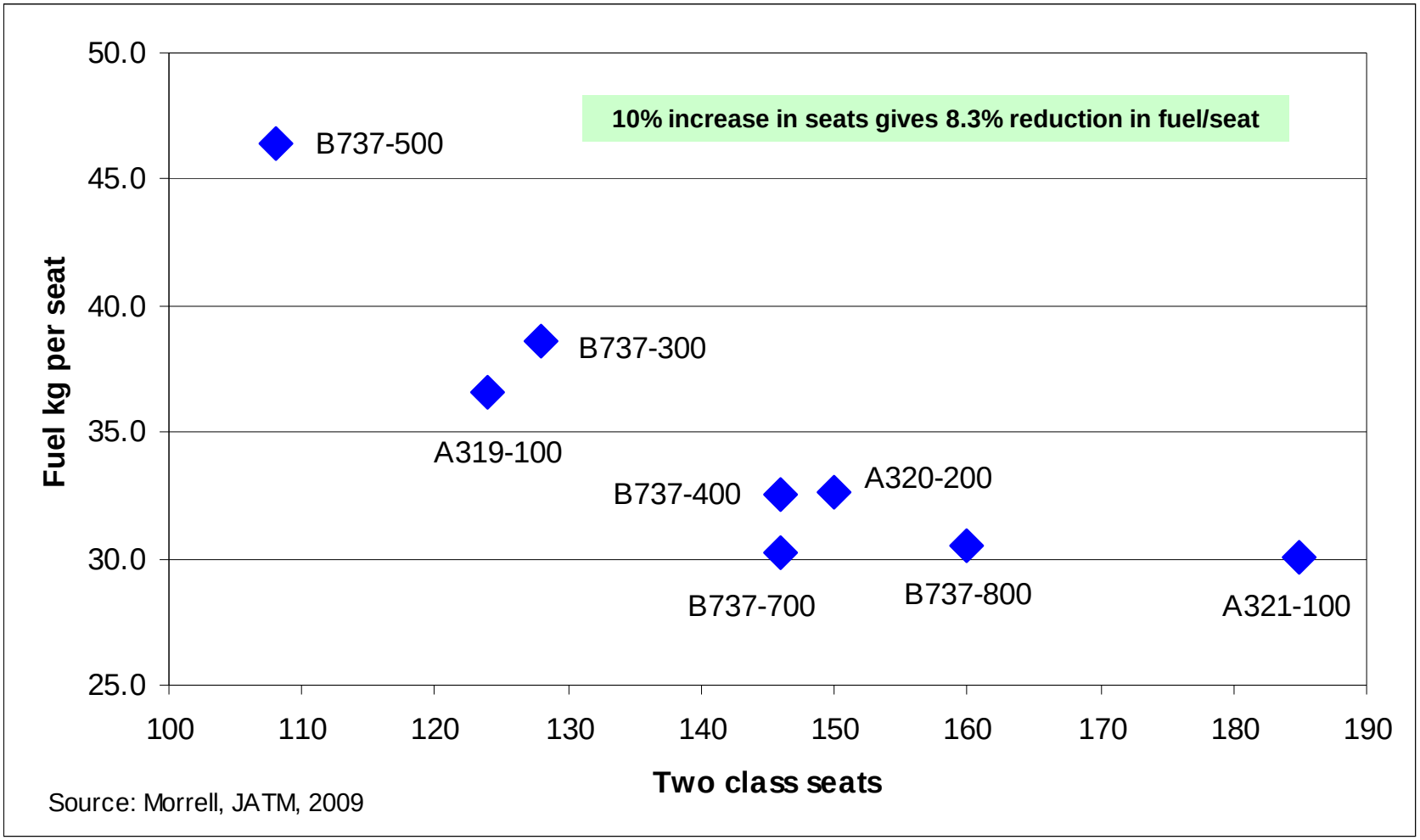
  Market reaction?

  Competitor advantage?

Aircraft size: network airlines on intra-European routes

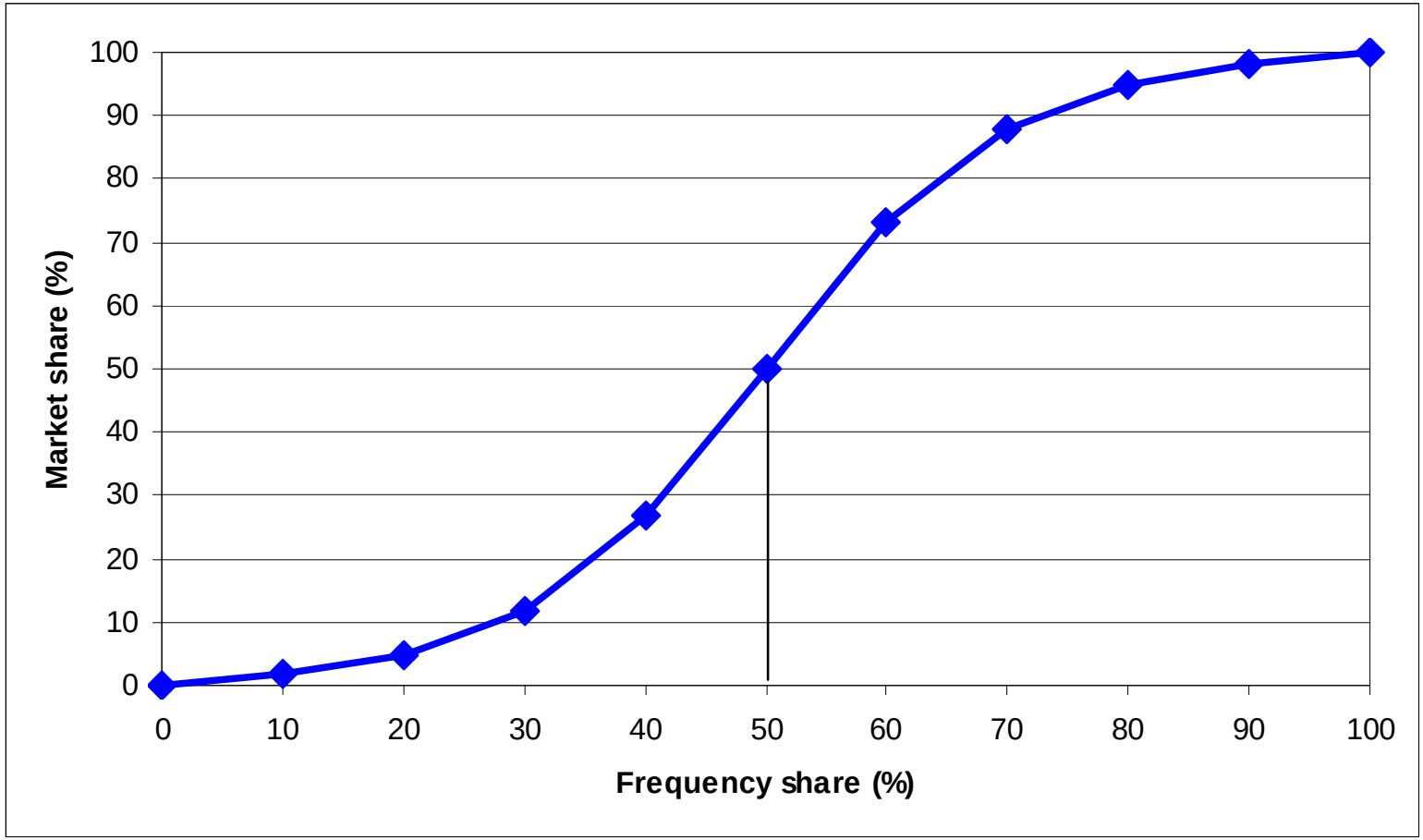


Economies of scale: short/medium-haul aircraft



Source: Morrell, JATM, 2009

Airline ‘S-Curve’ for two airline route



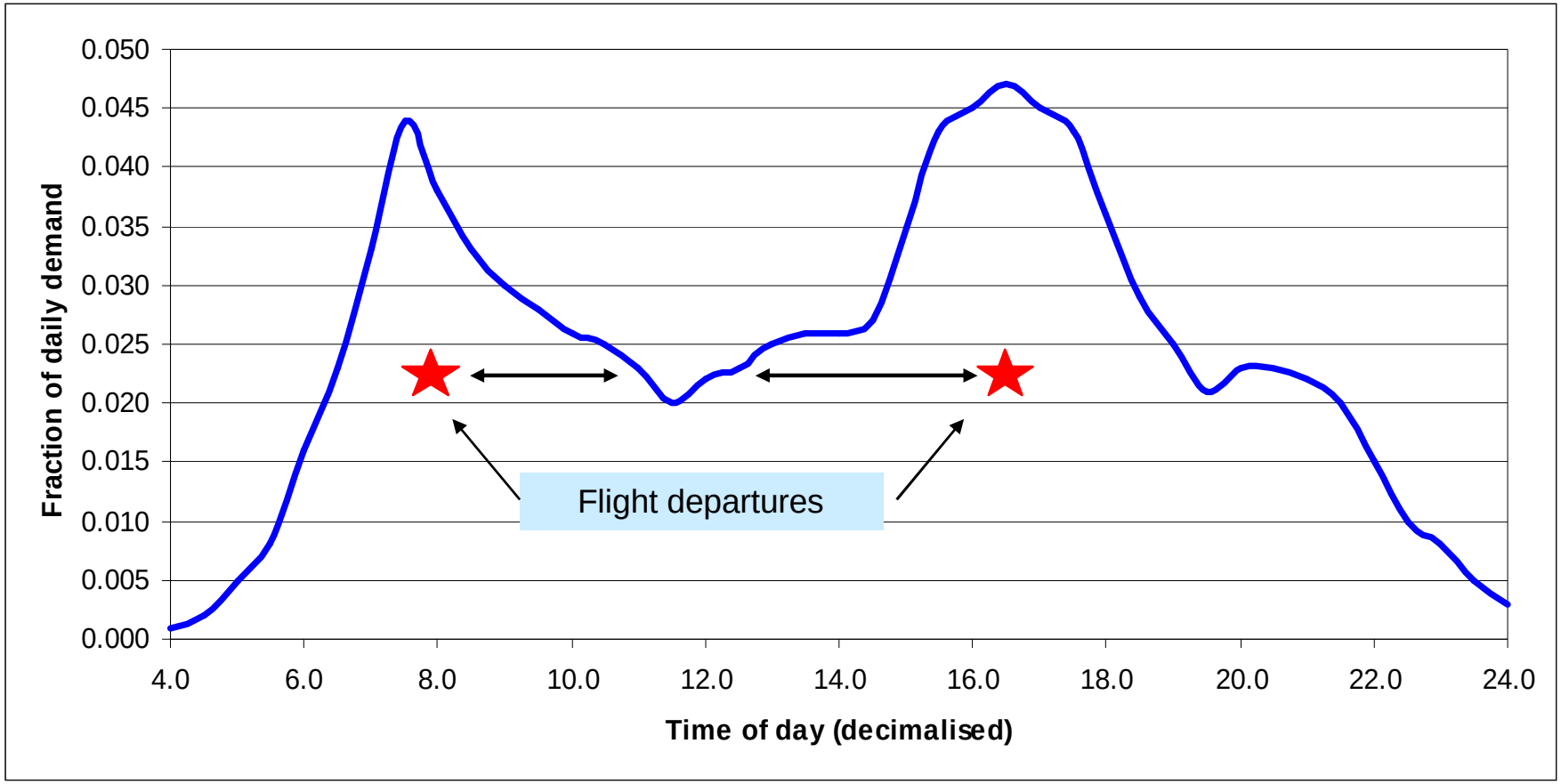
S-curve relevance?

- More relevant to business travel which may account for minor share of route traffic
- Growth of LCC and greater emphasis on price
- Greater fare transparency through web distribution
- Frequency may be hub dependent: need to connect with 3-6 banks of departures or arrivals
- Business travellers trade flexibility for price, and inconvenient flight times costs less in time lost

But airline schedule planners still believe in it?

Preferred passenger departure times:

60 minute sector (Source: New York/Washington DC shuttle)



What if: reduce frequency from 9 to 6 dailies:
Offer same total seats with larger aircraft

	9 flights/day	6 flights/day	% change
Av. seats/flight	157	227	45
Fuel tonnes per flight	4.4	2.8	-37
Total CO_2 tonnes emitted/day	125	52	
Time lost (hours/day)	521	740	
Time value: US$/hour	80	80	
Cost of time lost ($/day)	41,640	59,200	
Increase in time $			17,560
CO_2 US$/tonne	68	68	
CO_2 allowance values $	8,482	3,563	
Less allowances needed $			- 4,920
Net saving in US$			- 12,640

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Fuel tonnes per flight	4.4	2.8	-37
Total CO_2 tonnes emitted/day	125	52	
Time lost (hours/day)	521	740	
Time value: US$/hour	20	20	
Cost of time lost ($/day)	10,410	14,800	
Increase in time $			4,390
CO_2 US$/tonne	68	68	
CO_2 allowance values $	8,482	3,563	
Less allowances needed $			- 4,920
Net saving in US$			+ 530

Cost-benefit

- **Time lost due to less convenient schedule in addition to airport processing time**
- **Is this time really lost?**

  Arrive too early at airport but with 'mobile office'

  Wait for next return flight: catch up on e-mails
- **Frequency sensitive business passengers becoming more price sensitive**

  More flying on LCCs

  Fixing meetings in advance to suit schedule
- **Larger aircraft offer fare reductions if load factors maintained**

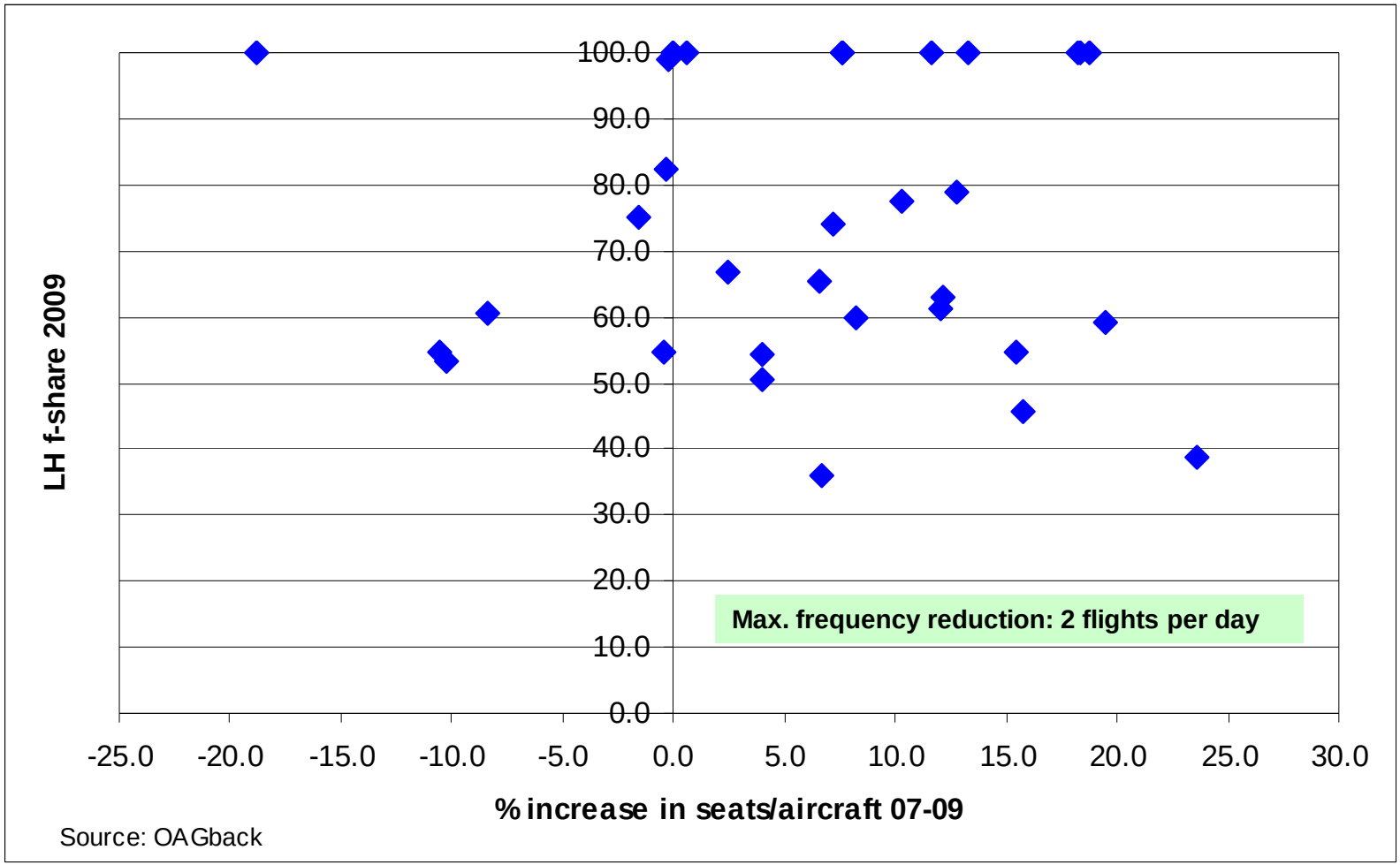
  Lower unit costs and no allowance surcharge

Lufthansa Case Study

- Look at most frequently served domestic and intra-EU routes
- Change in frequencies and average seats per flight between Summer 2007 and Summer 2009
- See if frequency reductions (aircraft size increases) are associated with higher share of frequency of all airlines on that route
- Most routes were domestic, and where there was competition LH maintained f-share at >50%
- Routes to/from slot constrained airports (eg Frankfurt) already tended to be used by larger aircraft
- But fleet planning and aircraft scheduling on network basis

Lufthansa: intra-EU routes

> 6 flights per day in June 2009



Conclusions

- EU aviation ETS may lead to longer term network and scheduling changes
- Frequency versus market share relationship declining in importance
- Lower value of time for business passengers also implies less need for very high frequencies
- Using larger aircraft gives benefits of lower unit costs and less ETS emissions allowances needed
- But frequencies need to allow business day trips and feed banks of flights at hub airports
- And aircraft scheduling needs to be optimised at network level