ANALYSIS OF THE EU AIR TRANSPORT INDUSTRY

Final Report 2006

Contract no: TREN/05/MD/S07.52077

by

Cranfield University
Department of Air Transport

CONTENTS

Tables

Figures

Section 1

Air transport industry overview

1 Air transport industry overview

1.1 Regulatory developments

In 2006, eleven countries (Australia, Dominican Republic, Malaysia, Maldives, Moldova, Morocco, New Zealand, Paraguay, Singapore, Thailand, Uruguay) initialed "horizontal agreements" (bringing bilateral agreements with third countries into line with European law), bringing the total number of such deals to twenty-two.

In December 2006 the EU Morocco aviation agreement was signed, extending the application of the Barcelona Process, under which the EU is establishing closer links with a number of countries bordering the Mediterranean. The agreement encompasses harmonisation of competition, state-aid and consumer protection rules, and a number of other fundamental objectives, including the enhancement of flight safety and security.

The European single aviation market was extended through the incorporation of ten states in an agreement between the parties signed in June 2006. Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Iceland, Macedonia, Norway, Romania, Serbia and Montenegro, plus the Serbian province of Kosovo join the 25 European Union member states in creating a European Common Aviation Area (ECAA).

In March, the EC published the first list of airlines banned from operating in the EU under Regulation (EC) 2111/2005. This established a list of air carriers subject to an operating ban within the Community, and required that air passengers be informed of the identity of the operating air carrier.

The Commission adopted a decision requesting the European Court of Justice to impose a lump sum penalty and a periodic penalty on Greece for its failure to implement its 2002 decision in relation to the recovery of state aid, estimated to be at least €160 million, granted to Olympic Airways between 1998 and 2002.

In July, the Commission adopted a Proposal aimed at simplifying and consolidating existing legislation by removing obsolescent parts of the Third Package and providing clarification of the text where it is needed. The three existing Regulations of the Third Package have been consolidated into a single draft Regulation.

In December, the Commission adopted a Regulation (1794/2006)establishing a common charging system for air navigation services. The aim was to achieve greater transparency and encourage the safe and effective provision of air navigation services.

The Commission opened a formal investigation into the rules imposed by Italy in May on sixteen air routes between three airports in Sardinia and the Italian mainland.

In October, the Commission adopted a Regulation (1546/2006) restricting the amount of liquids that passengers can carry past screening points and onto aircraft. The Regulation relates only to the carriage of cabin baggage. The Regulation follows the information given by British Intelligence on an apparent plot in August to blow up aircraft flying from UK to US.

1.2 Air transport capacity

There was a ratio close to 2:1 of scheduled city-pair routes inaugurated to those dropped between June 2005 and the same month in 2006. 734 direct, non-stop services were launched

between cities in Europe. Of the net increase, 41 were domestic services and 318 were cross-border routes.

The high turnover of routes is a manifestation of the entrepreneurial spirit of low-cost carriers, and the ease with which the deregulated market allows them to start new services, and abandon those that cannot be operated profitably. By summer 2006, LCC were in fact supplying one-third of all seat capacity operating on intra-European routes.

Many of the new services were single-carrier routes. Indeed, the proportion of routes operated by single carriers in Europe rose slightly to 71%.

There were very few airline failures in 2006. These were limited to the charter sector, although rationalisation among LCC saw Virgin Express join SN Brussels to create Brussels Airlines, and hlx formed TUIfly.com with its charter associate airline, Hapagfly. The one new airline to begin operations was LCC Clickair, part-owned by Iberia.

1.3 Traffic

IATA reported slower growth rates in 2006 but more profit for its member airlines. While RPK growth dropped from the 2005 level of 7.6% to 5.9% in 2006, average passenger load factors increased from 75.1% to 76.0%. Cargo growth improved over 2005 rates, but continued below the historical growth trend of 5.6%.

The bottom line improved while passenger traffic growth slowed. The industry reported an estimated operating profit of over USD10 billion for 2006, with net losses reduced to around USD500 million.

For AEA member airlines, the North Atlantic market continued to be the most important in terms of RPK and revenue. Here passenger traffic was up but by just one-half of a percent. In the European markets, the most important in terms of passengers carried, AEA airlines were up by a healthy 9.1% (domestic RPK) and 8.9% (international RPK). The fastest growing market for European carriers continued to be the Far East and Australia, where passenger numbers were up by over eleven percent and RPK by ten percent.

Low-cost airlines on intra-European routes carried in excess of 150 million passengers in 2006, an increase of around 30% on 2005. Ryanair and easyJet transported nearly 50% of LCC passengers. Ryanair again grew twice as fast as easyJet in 2006 increasing its passengers by 22% compared to easyJet's 11%.

The charter airlines continued to lose their European short-haul markets to LCC, but a number of charter carriers have shifted towards supplying long-haul services (particularly destinations in the Caribbean, Central America and India) or to short-haul destination where low-cost operations are not yet established (e.g. North Africa).

1.4 Airline financial performance

The major European network airlines achieved a small operating margin of 3.2% in 2006, unchanged from 2005, in a difficult year of further increases in fuel costs. These results would have been worse were it not for an increase in overall load factor to almost 70%. Yields increased by 4% helped by fuel surcharges, but unit costs advanced faster in spite of the contribution of lower unit labour costs discussed above.

The weighted average rate of exchange used to convert local currencies to the US dollar was slightly up on the year. Average spot fuel prices were up by 16% in calendar year 2006. The twelve airlines made a pre-tax profit of USD4.1billion in 2005, falling slightly to USD3.4billion in 2006. Pre-tax losses were made in 2006 by Aer Lingus, Alitalia, Austrian,

Czech Airlines and Finnair. However, Swiss and SAS both moved into profit in 2006, after reporting pre-tax losses in 2005.

Financial results for seven European charter and LCC airlines revealed an operating margin of 8.9% in 2006, up by 1.6% points from 2005. This sample included the three largest LCCs, but only one charter/leisure airline (or two of Air Berlin is included in this category). The sample's yields rose by 11% while unit costs advanced by only 6%. Average load factors were 81.2% in 2006, down by 0.9% points compared to 2005. Only four out of the seven airlines were profitable at the operating level in 2006.

Table 1.1: Financial results: major European network carriers

	2005*	2006*	%(pts) change
Operating margin (%)	3.2	3.2	0.0
Pre-tax margin (%)	4.6	3.5	-1.1
Total revenue per RTK (US cents)	104.5	108.2	3.6
Operating cost per ATK (US cents)	69.5	72.9	4.9
Overall load factor (%)	68.7	69.5	0.8
Debt/equity ratio (average over year)	1.14	0.90	-0.24
Pre-tax profit as % long-term capital	5.4	5.4	0.0
After tax profit as % equity	16.5	11.2	-5.3
Operating leases as % long-term capital	38.8	38.0	-0.8
Average passenger haul (kms)**	2,265	2,230	-1.6

* Aggregate of airlines reporting different financial year ends: largest part of FY falling in 2006 or 2007

** based on IATA data for calendar year

Few of the major European regional airlines publish financial data, being part of larger groups. Of the ones that did, Air Nostrum, Aegean, Malmö Aviation, Widerøe and Binter Canarias all produced positive operating margins ranging from 1.2% for Widerøe to 10% for Aegean. Malmö Aviation moved from an operating loss in 2005 to profit in 2006.

1.5 Airports

Robust traffic volumes during 2006 at European airports have contributed to improved yields from aeronautical and non-aeronautical sources. However, airport operators continue to face cost pressures as a result of more stringent passenger security requirements. As a result there was a very modest increase in operating margin from 21.6% to 22.2%.

Two significant transactions occurred in 2006. Ferrovial completed its purchase of BAA and the French government completed the partial privatisation of Aéroports de Paris. Fraport secured a number of overseas airport assets in 2006 gaining footholds in India and Bulgaria.

Europe's largest airport operator, BAA, also faces the prospect of being forced to sell some of its core UK assets after the UK Office of Fair Trading launched an investigation into the structure of the UK airport industry.

In terms of airport traffic worldwide, ACI reported passenger numbers and freight up by around four percent overall. The organisation's European airports reported total passenger traffic up 5.2% and freight throughput up 4.4%. London Heathrow, Paris Charles de Gaulle and Frankfurt are the European airports within the world's top ten in passenger numbers. Of these three, only Heathrow fell in passenger terms, down 0.6% (representing some four hundred thousand passengers fewer than in 2005). The weak performance at Heathrow was,

in part, due to the impact of the imposition of strict security in the aftermath of the terrorist alert which hit the UK's airports in August.

1.6 Air traffic management

Two important regulations, based on interoperability of air traffic management systems, were adopted by EC to advance development of the Single European Sky concept. These dealt with exchange of flight data and procedural requirements for flight planning. EC regulators also adopted new rules on airspace classification to move towards unification of air traffic operations under the Single European Sky programme, and agreed to adopt a common charging scheme for air navigation services from the beginning of 2007, again in line with the initiative to unify European airspace.

Eurocontrol reported a traffic increase of just over four percent in 2006, with its Central Flow Management Unit handling an average of 26,286 flights a day. Capacity increased by somewhat less than the rate of increase in traffic, and the result was a 4.6% increase in average delay attributable to AFTM. Although 2006 witnessed a very similar growth in traffic to that seen in 2005, the rate of increase in delay recorded in 2006 represented a very significant improvement over 2005, when average delay was up almost eighteen percent over 2004 levels.

1.7 Air transport and the environment

The Council of ICAO adopted from 1 January 2006 a new Chapter 4 noise standard, more stringent than that contained in Chapter 3.

The Airbus A380 received joint European Aviation Safety Agency (EASA) and Federal Aviation Administration (FAA) Type Certification on 12th December 2006. This was the first large European aircraft to obtain such approval from EASA. The aircraft meets the ICAO Stage 4 noise requirements by a comfortable margin, as well as complying with the stringent London Heathrow Airport QC2 departure and QC0.5 arrival noise limits.

On 20 December 2006, the Commission adopted a proposal for legislation to include aviation in the EU Emissions Trading Scheme (ETS).

Eurocontrol proposed the incorporation of environmental charges into its route charging system in its August 2006 business plan, as an interim measure while the introduction of an emissions trading scheme is pursued by the European Commission.

Sweden's newly-elected Government reversed plans by the country's previous administration to impose a new environmental tax on departing airline passengers.

IATA reported that fuel efficiency for their members' system-wide services in 2006 improved by 2.2% from 40.3 litres per RTK in 2005 to 39.4 in 2006.

1.8 Safety and security

The number of aircraft accidents involving fatalities was down in 2006, although the number of fatalities involved increased. ICAO recorded thirteen accidents involving 755 passenger fatalities. World passenger traffic, measured in RPK, was up some five percent, but fatalities per one hundred million RPK rose only very slightly.

In Europe, EASA recorded six fatal accidents involving fixed-wing aircraft in public service operations, against five the previous year and just two in 2004. The 2006 accidents resulted in the loss of 146 lives.

On 10 August, police in the UK arrested suspects allegedly involved in a plot to smuggle liquid explosives on board aircraft. The British terror alert was raised to a level signalling that an attack was thought imminent. In the immediate aftermath, passengers travelling from UK airports were allowed only to carry travel documents onto aicraft. These restrictions were later modified to permit limited amounts of baggage to be taken onboard.

The Commission adopted a Regulation restricting the liquids that passengers can carry airside.

1.9 Aircraft and manufacturers

Boeing's market share for large airliners (in terms of net orders) increased to 57%. In terms of market value, the airbus share of the market was probable closer to 38%, due to the shift in orders towards Boeing's more expensive wide-body aircraft.

Orders for larger regional jets, such as the Embraer 190, improved. At the same time, order books for regional jets below the eighty-seat level deteriorated. Turboprop orders continued to be healthy, with ATR's production of it ATR42 and ATR 72 aircraft increasing to twenty-four units (fifteen in 2005).

Section 2

Regulatory developments

2 Regulatory developments

2.1 Global developments

During the year a further five "Open Skies" bilateral agreements were concluded by eight States, raising the total number of such agreements to 123 and involving some 88 countries in all[1]. These agreements provide full market access without restrictions on route rights, designation, capacity, code-sharing and tariffs. At the regional level, eleven liberalized agreements were in force, with significant developments occurring in the sub-regions covered by the BIMP East ASEAN Growth Area (Brunei, Indonesia, Malaysia and Philippines) and the IMT Growth Triangle (Indonesia, Malaysia and Thailand) as a result of fifth freedom rights being allowed[2].

In 2006, approximately one third of country-pairs with non-stop passenger services and close to one half of all seat capacity occurred between States that have embraced liberalization, either through bilateral "Open Skies" agreements or via regional liberalized agreements.

In September, the World Trade Organization (WTO) held the first substantive meeting for the second review of the Annex to the General Agreement on Trade in Services (GATS) on Air Transport Services. Discussions focussed on the assessment of developments in eleven air transport sector activities, including the three areas covered under the Annex, namely: aircraft repair and maintenance, sales and marketing, and computer reservation systems. The other activities reviewed were ground handling, franchising, rental and leasing, airport management, air traffic services, catering and refuelling.

The continuing expansion of airline alliances and increasing merger activity continued to attract the attention of regulatory authorities across the world during 2006. In February, the US Department of Transportation (DOT) dismissed the application for antitrust immunity from six airlines participating in the SkyTeam alliance. In November, the Australian Competition and Consumer Commission (ACCC) proposed to deny authorization of a trans-Tasman alliance agreement between Air New Zealand and Qantas.

The scope of inter-airline agreements carried out by the International Air Transport Association (IATA) was diminished significantly in some jurisdictions during 2006. In July, the US DOT proposed the withdrawal of its approval of, and antitrust immunity for, IATA's tariff conference discussions and agreements on fares and rates for EU-US and US – Australia markets. In November, ACCC issued its final determination proposing the phased removal of authorization for most of IATA's activities.

[1] These include three new US Open Skies deals with Cameroon, Chad and the Cook Islands.

[2] The eleven liberalised agreements and the years in which they were concluded are as follows: Caricom (9 Caribbean states) 1996); Fortaleza (6 MERCOSUR states) (1997); Banjul Accord (6 West African states) (1997); Cambodia Laos Myanmar Vietnam (CLMV) (1997); ACAC (16 Middle East and North African states) (1999); CEMAC (6 Central African states) (1999); COMESA (20 Eastern and Southern African states) (1999); Yamoussoukro 2 (52 African Union states) (1999); IMT (Indonesia, Malaysia and Thailand) (1999); BIMP (Brunei, Indonesia, Malaysia and Philippines) (1999); MALIAT (Brunei, Chile, New Zealand, Samoa, Singapore, Tonga and US) (2001).

2.2 EU developments

2.2.1 Community air services agreements with third countries

The Commission continued with the process of bringing the existing 2,000 bilateral agreements with third countries into line with European law. By the end of 2006, a further eleven countries (Australia, Dominican Republic, Malaysia, Maldives, Moldova, Morocco, New Zealand, Paraguay, Singapore, Thailand, Uruguay) had initialed "horizontal agreements", bringing the total number of such deals to twenty two and resulting in some 350 bilateral agreements being brought into legal conformity.

In a further step towards plans to expand the European single aviation market through the incorporation of ten, mostly-southeast European, states, an agreement between the parties was signed in June 2006. Under the move, eight southeast European states and provinces – Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, Serbia and Montenegro, plus the Serbian province of Kosovo – as well as Norway and Iceland will join the 25 European Union member states in creating a European Common Aviation Area (ECAA).

The EU Morocco aviation agreement, signed in December 2006, not only places the North African country within the European open skies area, harmonising competition, state-aid and consumer protection rules, it also encompasses a number of other fundamental objectives. These include the enhancement of flight safety and security, while cross-investment between European and Moroccan companies will be possible. The agreement also contains several important provisions concerning environmental protection, and provides for streamlining administrative procedures.

In November 2005, the US Department of Transportation (DOT) had made a formal proposal to change the way it interprets US legislation in respect of ownership and control of US air carriers. The following month the decision was welcomed by the European Council of Ministers and identified as representing a significant move in the negotiations for an EU-US aviation agreement. Unfortunately, the DOT proposal to amend its interpretation of the ownership and control rules met with strong opposition in the US. As a consequence, US reform of this matter did not prove forthcoming and in December 2006 the DOT formerly withdrew its proposal.

2.2.2 Operating ban for safety reasons

In March, the EC published the first list of airlines banned from operating in the EU under Regulation (EC) 2111/2005. Aside from establishing a list of air carriers subject to an operating ban within the Community, the Regulation requires that air passengers be informed of the identity of the operating air carrier. The listing of banned carriers is updated quarterly.

In December, following an inspection undertaken by the European Aviation Safety Agency (EASA), the Commission decided to partially exclude Bulgaria from participating in the internal aviation market. The Commission considered that there was a considerable risk that Bulgaria would not be able to ensure full compliance with the Community rules on aviation safety and on the internal aviation market. A safeguard clause based on the Act of Accession was invoked, in order to ensure the proper functioning of the EU air transport market and to guarantee the highest level of safety to EU citizens.

2.2.3 Rescue aid

In March, the Commission authorised the Italian Government to provide rescue aid, consisting of a €25 million six-month duration guarantee, for the Italian carrier, Volare Airlines. Also in March, the Commission launched an investigation into the financing of a

restructuring plan put forward in November 2005 by Cyprus Airways. The plan involved the airline receiving aid from the Cypriot Government in the form of a €52 million loan.

2.2.4 State aids

In November, the Commission began a detailed investigation into possible aid granted by Saxony to DHL and Leipzig/Halle airport through the provision of finance for a new runway and financial guarantees. The Commission sought to ensure that DHL would not receive additional state aid above the amount of regional investment aid already approved for the new DHL hub at the airport, in order to prevent the distortion of competition in the express parcels market.

In October, the Commission adopted a decision requesting the European Court of Justice to impose a lump sum penalty and a periodic penalty on Greece for its failure to implement its 2002 decision in relation to the recovery of state aid, estimated to be at least €160 million, granted to Olympic Airways between 1998 and 2002. In April, the Commission had decided to refer Greece to the European Court of Justice for failure to comply with its state aid decision of 14 September 2005, which required the Greek Government to quantify and recover all the unlawfully granted aid to Olympic Airways and Olympic Airlines since December 2002. It also asked Greece to immediately suspend all further payments of aid to Olympic Airways and Olympic Airlines, and gave Greece two months to inform the Commission of the steps taken to comply.

In May, the Commission approved a state aid scheme proposed by the Scottish Executive for aid of a social character for air services to, from and within certain areas of the Highlands and Islands of Scotland. The scheme, which will run for three years and is expected to cost €16 million annually, provides residents in the most peripheral parts of this region with up to 50% reduction in air fares on these routes.

2.2.5 Single market legislation for aviation

In July, the Commission adopted a proposal that aims to revise and consolidate the three key Regulations [(EEC) No 2407/92, (EEC) No 2408/92 and (EEC) No 2409/92] that are generally referred to as the Third Package of the internal aviation market. The aim is to ensure a consistent application of EU legislation in all Member States, thereby creating equal conditions for all airlines. The proposal was preceded by a period of public consultation with national authorities, international organisations, airlines, airports and organisations representing the workforce and consumers.

In respect of Regulation (EEC) No 2407/92 a need was identified for more detail in regards to tightening the monitoring of air carriers' financial viability and for stricter requirements for aircraft leasing. The proposal therefore requires Member States to reinforce the supervision of operating licences and confers the right to the Commission to revoke an operating licence. As regards aircraft leasing, the rules and practice involved in such activity differ between Member States. The safety assessment of leased aircraft from third countries is not pursued with the same degree of rigour in all Member States, raising concerns about safety. The proposal therefore introduces stricter requirements in order to minimise the risk of adverse social consequences and to enhance safety. The competent licensing authority will be required to confirm that safety standards equivalent to those of the Community are met. The possibility to lease aircraft that are registered in third countries will only be allowed in exceptional circumstances for a maximum of six months and be permitted to be renewed only once for a second non-consecutive period of up to six months.

As regards Regulation (EEC) 2408/92, there was broad agreement on the need to simplify the procedure for fulfilling public service obligations with a significant number of air carriers

stressing the risk of distortion of competition that could arise from their excessive use. A clarification of the rules concerning traffic distribution between airports and the adoption of objective criteria were favoured by most respondents. The proposal therefore revises the rules pertaining to public service obligations with the aim of lightening the administrative burden, avoiding the excessive use of PSO and attracting more competitors to tender. The Commission may require in specific cases the production of an economic report explaining the context of a PSO and where appropriate taking into consideration the availability of rail services with a journey time of less than three hours. The tender procedures have been modified by increasing the maximum concession period from three to four years (and five years in the case of ultra-peripheral regions).

The proposal removes inconsistencies between the internal aviation market and services to third countries. It also clarifies the rules applicable to traffic distribution between airports. The current two stage procedure is being replaced by a single stage procedure in which the concept of an airport system is abandoned. Under the new arrangement Member States may introduce traffic distribution rules on airports serving the same city or conurbation, but require the prior approval of the Commission.

As regards Regulation (EEC) 2409/92, air carriers are opposed to anything that might jeopardise their freedom to set fares. Some national and regional authorities and user organisations however, were willing to act to ensure greater transparency and genuine accessibility for all consumers in Europe to the air fares offered in the EU. The proposal therefore promotes price transparency for passengers and fair behaviour. Air fares will have to include all applicable taxes, charges and fees and be set without discrimination on the basis of place of residence or nationality of the passenger within the Community.

The proposal overall is aimed at simplifying and consolidating existing legislation by removing obsolescent parts of the Third Package and providing clarification of the text where it is needed. The three existing Regulations of the Third Package have been consolidated into a single draft Regulation.

2.2.6 Air navigation services

In December, the Commission adopted a Regulation (1794/2006) establishing a common charging system for air navigation services. The Regulation, which applied from 1 January 2007, regulates which costs are eligible and how users will be charged for air navigation services. The aim is to achieve greater transparency and encourage the safe and effective provision of air navigation services.

European Commission representatives adopted another pair of important regulations, based on interoperability of air traffic management systems, to advance development of the Single European Sky concept. The two regulations deal with exchange of flight data and procedural requirements for flight planning. Under the first of these, the 'co-ordination and transfer' regulation (EC) No 1032/2006, requirements were established governing the exchange of flight data which enables the smooth notification and transfer of flights between air traffic centres. This also covered data-exchange for coordinating air traffic movements with military centres The second regulation (EC) No 1033/2006, concerning flight plans, sets out the obligations of a centralised flight-plan processing and distribution service. It aimed to ensure that all parties connected with the flight-planning process – including pilots and air traffic centres – are granted access to the same flight plan before an aircraft's departure.

In addition, the EC regulators adopted new rules on airspace classification as part of the continuing effort to unify air traffic operations under the Single European Sky programme. The airspace classification regulation (EC) No 730/2006 created a common classification for

airspace above flight level 195 and laid down a set of access rules. Adoption of the airspace classification regulation was the latest step to establish a regulatory framework under the Single European Sky initiative.

In November, the Commission reached an agreement with the Russian Federation on the longstanding issue of Siberian overflight payments. The agreement provides for the gradual reduction of the overflight fees from 2010 and their abolition by 2013. EC carriers were obliged to pay $331 million to Aeroflot in 2005/6 to obtain rights to overfly Russia to Asian destinations.

2.2.7 Public service obligations on air services to Sardinia

In July, the Commission decided to open a formal investigation into the rules imposed by Italy in May on sixteen air routes between three airports in Sardinia and the Italian mainland. Serious doubts have been expressed by the Commission as to the conformity of the Italian public service obligations with the aviation market rules resulting in the market to Sardinia being closed. The investigation was to focus firstly on assessing the evidence that the routes are vital to the economic development of Sardinia and to check that the obligations imposed do not unduly close the market, secondly on examining the conformity with existing Community legislation of the requirement imposed on tendering carriers to operate two sets of routes (each set comprising two routes), and thirdly on checking the legality of the distribution of routes between Air One, Alitalia and Meridiana.

2.2.8 Development aid for regional airports

In September, the Commission decided to allow the Irish Government to provide up to €65.5 million over a five year period (2006-2011) for infrastructure developments at six small regional airports.

2.2.9 Air routes development funds

In November, the Commission decided to permit start-up aid for new air routes from Malta. The ruling, which lasts until September 2011, allows Malta to provide up to €58 million in aid for airlines to start-up new routes.

In May, the Commission approved a system providing start-up aid for new air services from regional airports in the UK. The aid can take the form of marketing support related to the launch and ongoing promotion of a new route and/or discounts on aeronautical charges levied by airport operators. Funding, which is limited to three years and is in line with previous Commission decisions in respect of route start-up aid, is available to all operators in a transparent and non-discriminatory manner. It is anticipated that the total budget for the three route development funds covering three regions in the UK will amount to €36 million over five years.

2.2.10 Aviation security

In October, the Commission adopted a Regulation (1546/2006) restricting the amount of liquids that passengers can carry past screening points and onto aircraft. The Regulation relates only to the carriage of cabin baggage. Small amounts of liquid in containers not exceeding 100ml are allowed, but they must be carried in transparent plastic bags of no more than one litre in capacity. The Regulation follows the information given by British Intelligence on an apparent plot in August to blow up aircraft flying from UK to US.

Section 3

Capacity and traffic

3 Capacity and traffic

3.1 Air services

In mid 2006, only one European state, Germany, offered at least one scheduled air link with each of the other European states shown in Figure 3-1. The figure covers city pairs (rather than airport pairs) and includes the EU, candidate states Croatia, FYR of Macedonia and Turkey, as well as EFTA countries Iceland, Norway and Switzerland. It includes routes operated within and between those states in June 2006.

Figure 3-1: Number of city-pair routes between and within states, June 2006

	AT	BE	BG	CH	CY	CZ	DE	DK	EE	ES	FI	FR	GB	GR	HR	HU	IE	IS	IT	LT	LU	LV	MK	MT	NL	NO	PL	PT	RO	SE	SI	SK	TR
AT	9																																
BE	2	0																															
BG	2	1	3																														
CH	5	3	1	5																													
CY	1	1	1	1	1																												
CZ	2	1	2	3	1	2																											
DE	33	9	21	24	7	11	100																										
DK	1	2	1	3	0	2	13	8																									
EE	0	1	0	0	0	1	3	1	2																								
ES	17	11	5	28	0	5	189	8	1	160																							
FI	2	1	0	2	2	1	8	4	2	7	28																						
FR	6	10	1	16	1	4	42	7	1	29	2	143																					
GB	8	12	5	16	17	13	56	14	2	183	4	99	177																				
GR	34	1	1	8	6	4	133	2	0	2	4	2	39	65																			
HR	4	3	0	4	0	3	21	0	1	0	0	4	12	0	8																		
HU	2	1	3	3	1	1	14	2	0	4	1	3	5	5	3	1																	
IE	2	2	0	2	1	2	11	1	1	22	1	20	61	2	1	2	7																
IS	1	0	0	1	0	0	4	1	0	2	1	1	3	0	0	0	0	7															
IT	10	12	2	25	2	5	106	7	1	42	7	32	56	11	5	5	9	1	127														
LT	1	1	0	0	0	1	11	3	1	0	1	1	2	2	1	1	3	0	2	1													
LU	1	0	0	2	0	1	4	1	0	11	0	5	2	4	0	1	0	0	8	0	0												
LV	1	1	0	0	0	1	5	1	1	2	2	1	3	0	0	0	1	0	1	1	0	1											
MK	2	0	0	2	0	1	4	0	0	0	0	0	0	0	1	1	0	0	2	0	0	0	0										
MT	1	1	1	2	1	1	6	0	0	0	1	5	7	1	0	1	1	0	6	0	1	0	0	1									
NL	2	1	2	3	2	1	13	2	1	17	1	12	25	11	5	1	3	1	16	1	1	1	1	1	1								
NO	1	1	2	1	0	3	12	11	1	18	1	7	16	5	6	1	1	1	9	2	0	2	0	1	5	115							
PL	2	2	1	3	1	2	32	4	1	10	2	5	26	13	2	2	10	0	15	2	0	1	0	1	2	4	10						
PT	3	3	1	6	0	1	32	2	0	17	3	13	27	0	0	1	4	0	5	0	4	0	0	0	6	2	2	27					
RO	5	1	1	1	1	1	10	2	0	4	0	3	1	2	0	5	0	0	26	0	0	0	0	1	2	0	1	0	14				
SE	2	2	1	3	0	2	14	9	2	10	7	6	9	4	1	3	3	1	4	2	0	1	0	1	2	7	5	2	0	46			
SI	1	1	0	1	0	1	2	1	0	1	0	1	3	0	0	1	1	0	1	0	0	0	2	0	1	0	1	0	0	0	0		
SK	1	1	1	1	1	4	4	1	0	1	0	2	4	1	3	0	1	0	3	0	0	0	0	0	1	0	0	0	1	0	0	1	
TR	6	5	1	6	7	1	69	4	0	2	1	4	19	2	1	2	3	0	3	2	0	1	1	1	11	1	4	1	1	3	1	0	54

Source: OAG

Between June 2005 and the same month in 2006, OAG records the loss of 375 direct, non-stop routes within the study area while 734 routes were inaugurated. Of the net increase, 41 were domestic services and 318 were cross-border routes. Table 3.1 shows the numbers of non-stop domestic city-pairs that were dropped, and the number started, over the twelve month period.

The EU countries with the greatest net gain in direct non-stop air services were Italy (9) and Spain (6). Italy had the greatest number of new city pairs linked over the year, and matched the UK for the greatest turnover in routes. Net gains in Sweden reversed the trend towards retrenchment of domestic services recorded in recent years. Net losses of domestic services were recorded by a number of countries: for example, both Greece and Iceland experienced a rationalisation of some of their public service routes.

Table 3.1: Changes to domestic networks between June 2005 and June 2006

	city pairs		
	dropped	started	balance
Austria		1	1
Bulgaria		1	1
Croatia	1		-1
Czech Republic	1	1	0
Denmark	1	2	1
Finland	1	2	1
France	9	14	5
Germany	13	15	2
Greece	6	1	-5
Hungary		1	1
Iceland	5		-5
Italy	20	29	9
Lithuania	1		-1
Latvia		1	1
Netherlands	3		-3
Norway	6	11	5
Poland	1	2	1
Portugal	1		-1
Romania	3	2	-1
Spain	12	18	6
Sweden	5	10	5
Turkey	6	22	16
United Kingdom	23	26	3
TOTALS	**118**	**159**	**41**

Source: OAG

Over the twelve months from June 2005, the countries in the study group lost direct non-stop services on 257 city-pairs, but gained 575 new city-pair routes. Table 3.2 summarises this activity in the cross-border environment. The net change in the number of city-pair routes is presented for each country. Only routes within the EU and candidate states are considered and routes are double-counted, e.g. Frankfurt Malta service would appear under Malta's new services as well as Germany's. The high turnover of routes is witness to the ease with which airlines can start operations on new routes – and quite as easily abandon them if traffic and revenue generation does not match expectations. LCC in particular have taken advantage of such opportunities, as they search for city pairs which can sustain profitable air transport operations.

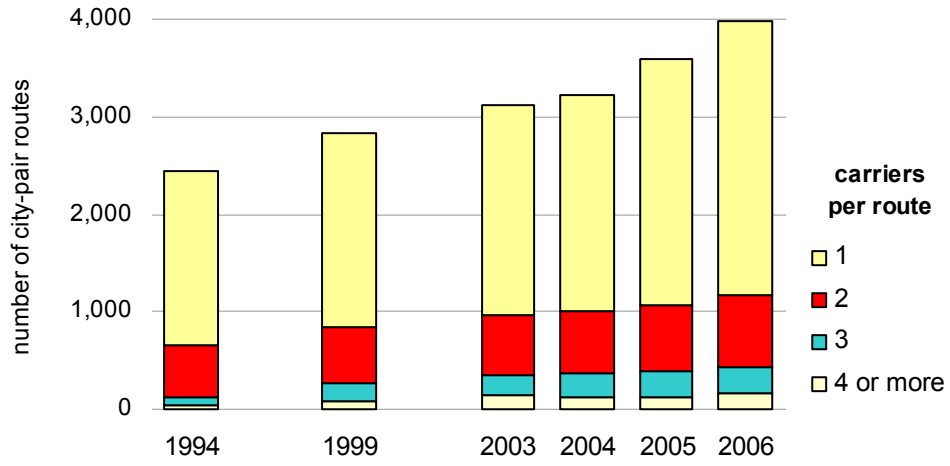
Table 3.2: New cross-border city-pairs, and abandoned routes, by state, 2005-2006

	Between June 2005 and June 2006		
	dropped	**started**	**balance**
United Kingdom	57	226	169
Spain	49	124	75
Italy	50	116	66
Greece	37	87	50
Poland	16	52	36
France	43	74	31
Turkey	8	39	31
Norway	4	29	25
Ireland	21	45	24
Germany	74	97	23
Switzerland	14	34	20
Austria	22	39	17
Romania	2	18	16
Hungary	2	15	13
Lithuania	1	14	13
Croatia	10	21	11
Czech Republic	2	10	8
Slovakia	3	10	7
Sweden	10	15	5
Belgium	6	10	4
Cyprus	6	8	2
Finland	5	7	2
Estonia	1	2	1
Iceland	0	1	1
FYR Macedonia	0	1	1
Portugal	14	15	1
Latvia	3	3	0
Malta	2	2	0
Netherlands	18	18	0
Slovenia	2	2	0
Bulgaria	13	10	-3
Luxembourg	3	0	-3
Denmark	16	6	-10
Total city-pairs:	257	575	318

Source: OAG

The total number of city-pair routes grew by close to 11% in the twelve months to June 2006. Figure 3-2 shows that although the proportion of single-carrier routes followed a slow decline between 1994 and 2004 (to just under 69% of all European city-pairs) this was reversed in subsequent years. By June 2006 some 71% of European schedule air services were operated by only one airline. This further emphasises the impact of deregulation and the role of LCC in shaping the air transport network. Many of the new point-to-point routes established are still in an initial phase of development, with passenger demand unlikely to attract competition. One of the busiest routes in terms of operating carriers was Madrid Milan, where eight airlines operated between the three airports of Milan and Madrid Barajas.

Figure 3-2: Evolution of European routes served by single carriers, 1994-2006



Source: OAG

The change in the numbers of routes operated is not always reflected in changes in the level of air transport activity, measured by scheduled flights (Table 3.3). Although the Spanish market recorded a net increase of six routes, the overall number of domestic flights performed per week remained largely unchanged. The same situation developed in France, while in Germany domestic flights fell in number comparing June weeks of 2005 and 2006, despite a small net increase in the number of city-pairs served. This reflects the tentative nature of many new route initiatives, and perhaps also highlights the impact of high-speed rail services on the demand for domestic air transport.

Romania showed particularly high levels of growth, with a net gain of sixteen new cross-border European destinations and a 27% increase in international flights per week. Domestic frequencies in Romania were up by 10%, despite a net loss in Romanian domestic city-pairs.

Table 3.3: Departing flights per week from European countries, June 2006

	Domestic		Intra-Europe			Domestic		Intra-Europe	
	flights per week	increase over 2005	flights per week	increase over 2005		flights per week	increase over 2005	flights per week	increase over 2005
Austria	336	-13%	2,059	-4%	Latvia	8	none in 2005	292	11%
Belgium	0	0	1,949	0	Lithuania	2	-1	296	0
Bulgaria	28	75%	323	15%	Luxembourg	0	0%	381	4%
Croatia	145	-15%	388	16%	Malta	68	-46%	192	0%
Cyprus	0	0%	369	-2%	Netherlands	38	-61%	3,420	6%
Czech Republic	78	18%	1,224	4%	Norway	4,773	3%	1,550	18%
Denmark	670	-2%	2,230	-7%	Poland	518	9%	1,497	20%
Estonia	46	0%	230	6%	Portugal	916	-2%	1,477	12%
Finland	1,402	10%	1,078	2%	Romania	206	10%	640	27%
France	6,440	0%	6,127	6%	Slovakia	28	-36%	230	15%
Germany	5,833	-8%	11,299	3%	Slovenia	0	0%	202	5%
Greece	2,015	4%	1,276	10%	Spain	8,937	0%	6,671	7%
Hungary	23	none in 2005	966	1%	Sweden	2,649	-1%	1,939	1%
Iceland	223	-29%	115	-17%	Switzerland	288	4%	3,036	-1%
Ireland	330	-1%	1,908	3%	Turkey	2,075	26%	1,132	16%
Italy	5,994	4%	5,800	5%	United Kingdom	8,943	1%	10,740	4%

Source: OAG

3.1.1 Public service obligations (PSO routes)

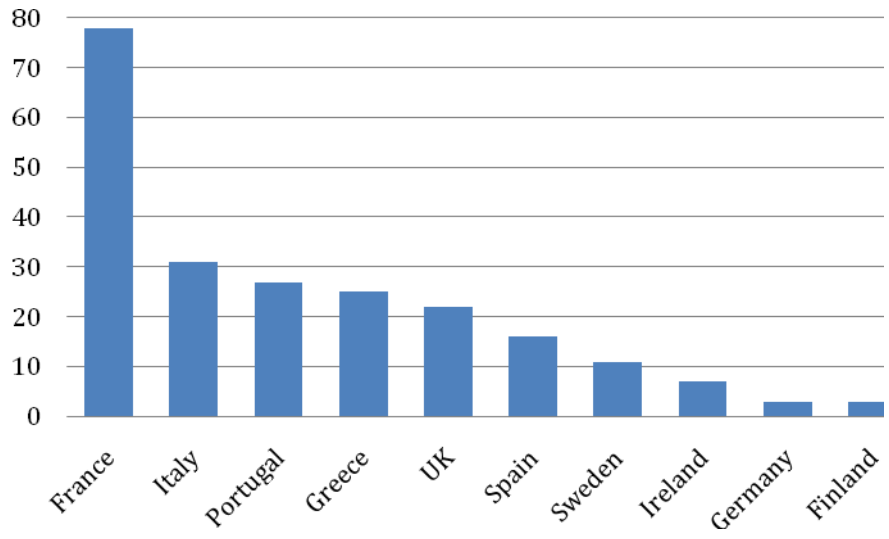
Article 4 of Council Regulation (EEC) No. 2408/92 provides the legal basis for the imposition of PSOs and necessary subsidy on any route, or group of routes, within the whole European Economic Area (EEA). The Regulation states that a PSO is only permitted on a

route “serving a peripheral or development region”, or on a “thin route to any regional airport” which is considered “vital for the economic development of the region”. A PSO can be imposed “to the extent necessary to ensure … the adequate provision of scheduled air services satisfying fixed standards of continuity, regularity, capacity and pricing, which … carriers would not assume if they were solely considering their commercial interest”.

PSO notice to operate a route without subsidy is initially published in the Official Journal of the European Union to ensure that the standards of service cannot be provided under free market conditions. If no carrier intends to operate the route under public service obligations, the Member State may publish an invitation to tender to be published which is open to all carriers registered within the EEA. The earliest deadline for tender submission is one month from the publication date. An exclusive concession to a single carrier on a route under PSO cannot exceed three years.

A period of two months would usually elapse after submission of tenders before a selection is made which allows for consideration to be given on the level of compensation required to subsidise the route, and the adequacy of the service proposed. An exclusive concession should not be imposed on routes, according to Article 4, “where other forms of transport can ensure an adequate and uninterrupted service when the capacity exceeds 30,000 seats per year”.

Figure 3-3: PSO routes by country, December 2006



The PSO regulation requires that the operating carrier must adhere to clearly defined levels of service for the duration of the contract. In most cases the administering authority will determine that the airline shall provide a minimum daily service frequency and possibly a minimum number of seats. There are often specific timetabling requirements and many place importance on passengers being able to complete day return trips and make convenient onward connections. An increasing number of PSOs also set conditions relating to the type of aircraft that must be used.

By the end of 2006, the PSO has been adopted in ten of the 27 Member States: Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, Sweden, and the United Kingdom. Figure 3-3 illustrates the number of routes designated with PSO status in each of these countries as of December 2006. A total of 223 PSOs had been imposed, dominated by France with 78 such routes, representing around 35% of the total. They are followed by Italy with 31 routes (14%), Portugal with 27 routes (12%), Greece with 25 routes (11%), the United

Kingdom with 22 routes (10%), Spain with 16 routes (7%), Sweden with 11 routes (5%), Ireland with 7 routes (3%), Germany with 3 routes (1%), and Finland with 3 routes (1%).

At the end of 2006 a total of 223 PSOs had been introduced on routes within the EU, representing an increase of 13 over the previous year. Table 3.4 reveals that these additional PSOs were imposed by four countries: Italy (7), Greece (3), France (2), and the United Kingdom (1). This information is compiled from the regular updates published in the Official Journal of the European Union.

Table 3.4: PSO routes imposed during 2006

Italy	Greece	France	UK
Cagliari-Firenze	Athens-Kalimnos	Strasbourg-Prague	Cardiff-RAF Valley
Cagliari-Trapani	Thessaloniki-Kalamata	Strasbourg-Warsaw	
Lampedusa-Rome	Thessaloniki-Limnos-Ikaria		
Pantellaria-Rome			
Rome-Albenga			
Rome-Cuneo			
Trapani-Bari			

Other information relating to cases relating to PSO operations involving the Commission are referred to in section 2 of this report.

3.2 Airline start-ups and failures, 2006

An indication of the degree of competition from airlines in the EU is given by the start-ups and exits. Acquisitions or alliances are be discussed elsewhere in this report.

The list below shows the more prominent births and deaths that took place between January and December 2006. Ad hoc passenger and freight charter carriers (e.g. air taxi services) are not included. For start-ups, the launch flight, rather than company formation, triggers entry in our tables. In some cases, operations were suspended pending reorganisation or the search for additional finance. In other cases, the AOC of the airline was withdrawn and/or they filed for bankruptcy. Some of the births were relatively short-lived.

3.2.1 Airline start-ups

Network carrier start-ups

There were no births to report in 2006.

Regional airline start-ups

Manx2 operates scheduled passenger services from Isle of Man to destinations on the UK mainland, in Northern Ireland and Jersey. Flight schedules are aligned to enable connections to UK low cost carrier Jet2.

Charter airline start-ups

Audeli a subsidiary of Cygnus Air owned by Grupo Gestair was originally formed in 1987. The company's fleet of eight passenger aircraft is operated on behalf of Iberia.

Best Air — is a Turkish carrier formed in April 2006 which operates domestic and international charter services from its base at Istanbul using a fleet of two Airbus 321 and one MD-82 aircraft.

Flightline SL — a Spanish ad hoc charter carrier based in Barcelona and originally formed in 1994 now operates two BAe 146-300 aircraft on behalf of Orionair.

Hellenic Imperial Airways — a Greek charter carrier formed in May 2006 by Air Universal of Jordan. The carrier operates one Boeing 747-200.

XL Airways Germany — was established in January 2006 as Star XL German Airlines by the Avion Group following their acquisition of the assets of failed carrier Aero Flight. Based in Dusseldorf, the carrier was acquired by the Excel Leisure Group in October 2006 and its name altered to XL Airways Germany in December 2006. The carrier operated three Airbus 320 in 2006.

Three charter airlines changed their names during 2006: TUIfly.com (previously known as Hapagfly), XL Airways (previously known as Excel), and XL Airways France (formerly called Star). A further change in 2006 was that Air Atlanta Europe was merged into XL Airways.

Low cost carrier start-ups

Clickair — In response to pressure from many low-cost carriers at Barcelona airport Iberia decided to help create a new Spanish airline in which it has a 20% share. Air Nostrum's owners Nefinsa also own 20% while further 20% shares are owned by Cobra, Grupo Iberostar and Grupo Quercus. Iberia provided a fleet of A320s and services began on 1 October 2006 operating mostly on routes that Iberia had previously served.

3.2.2 Airline failures

Network carrier failures

There were none to report in 2006

Regional airline failures

There were none to report in 2006

Charter airline failures

Air Madrid — which commenced operations in May 2004 from its Madrid base operated mainly long haul services. During 2006 it employed a fleet of ten Airbus 330, 340 and 319 aircraft, but ceased trading in December 2006.

EIR Jet — also commenced operations in 2004 operating a fleet of three Airbus 320 aircraft. Based at Shannon the airline provided ad hoc and wet lease charter services.

Falcon Air	was formed in 1986 and operated a fleet of three Boeing 737-300QC aircraft from its base at Stockholm (Arlanda). It ceased operations in September 2006.
Fly Air	Turkish authorities suspended Fly Air's operating license in September 2006. The carrier had been operating a fleet of three MD-83 and two A300 aircraft. The airline, which was formed in 2002, had been the first private company to operate scheduled services within Turkey, but dropped these in 2006 to concentrate on charter operations.
Greece Airways	an Athens-based carrier ceased operations in November 2006. Owned by Air Scotland, the airline latterly operated a single Boeing 757-200 leased from Thomas Cook Airlines UK from Edinburgh and Glasgow to Mediterranean holiday destinations.

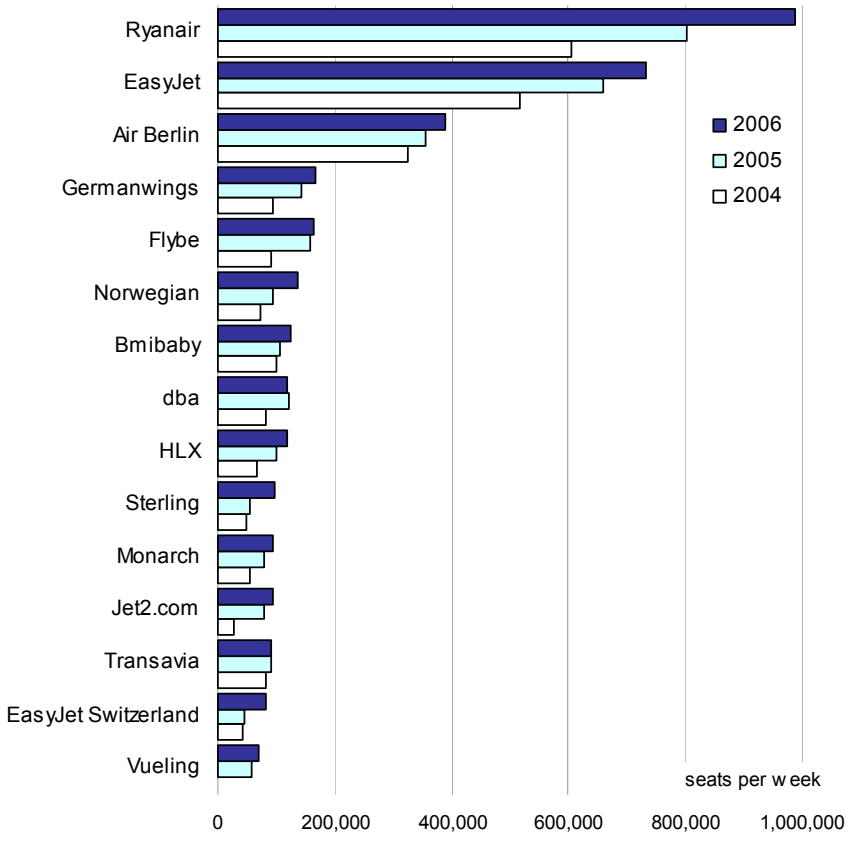
Low cost carrier failures:

Although no European LCCs actually failed during 2006 two established carriers Germany's hlx (Hapag Lloyd Express) and Belgium's Virgin Express announced that their brands would be disappearing during 2007. TUI-owned hlx would be combined with its charter partner Hapagfly to create TUIfly.com and Virgin Express confirmed that it would merge with SN Brussels Airlines to create a new carrier Brussels Airlines.

3.3 Low-cost carriers

Figure 3-4 shows the increases in seats per week provided by the largest low cost carriers between June 2004 and June 2006.

Figure 3-4: Seats provided by the top fifteen low-cost carriers, June, 2004 to 2006

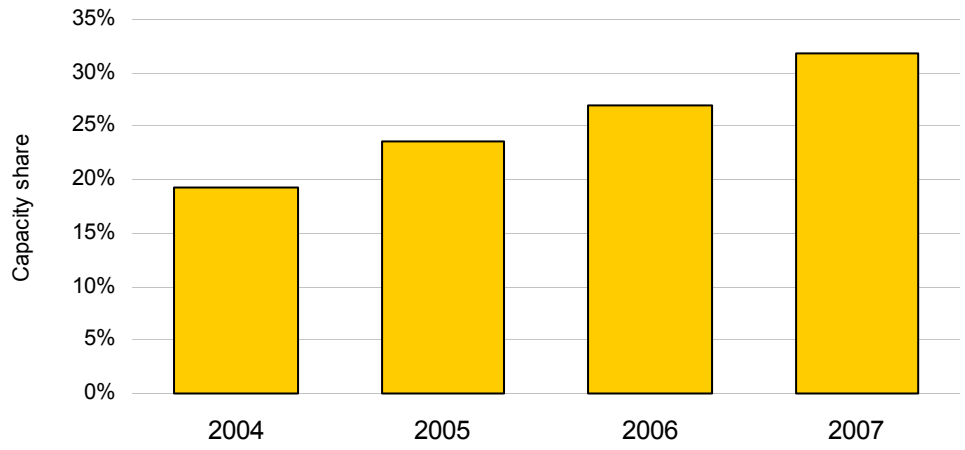


Source: OAG

Ryanair, the largest carrier, added significant amounts of capacity, up by two-thirds over the two years. Over the period, the fifteen airlines listed increased weekly seat capacity by an annual average of 25%. Indeed, much of the capacity growth on intra-Europe networks comes from LCC. By June 2006 they provided around 27% of seats on these services.

Taking a snapshot of intra-European passenger capacity on scheduled air services in summer of each year, Figure 3-5 shows the growth of the share supplied by LCC. Approaching one-third of all seats departing European airports on intra-European services were provided by budget carriers in June 2007. Here Europe is defined as EU, candidate states and EFTA countries.

Figure 3-5: Evolution of LCC capacity share (seats) on intra-Europe scheduled services



Source: OAG

3.4 Scheduled world overview of capacity and traffic

3.4.1 Passenger traffic

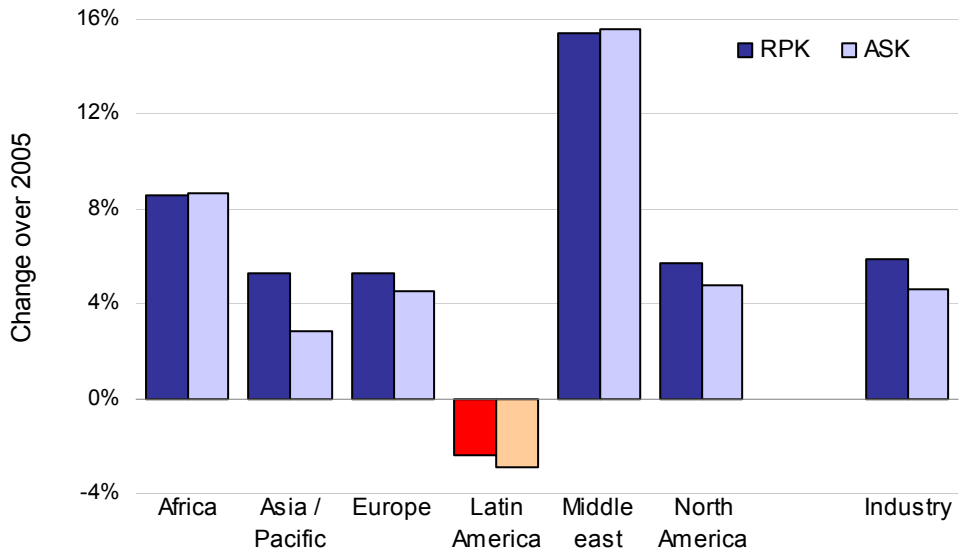
IATA reported slower growth rates in 2006 but more profit for its member airlines. Although industry-wide growth dropped from the 2005 level of 7.6% to 5.9% in 2006, average passenger load factors increased from 75.1% to 76.0%. Cargo growth improved over 2005 rates, but continued below the historical growth trend of 5.6%.

The bottom line improved while passenger traffic growth slowed. The industry reported an estimated operating profit of over USD10 billion for 2006, with net losses reduced to around USD500 million.

The levels of growth in passenger traffic and capacity, and the improved efficiency reflected in higher average load factors, were not reflected in all regions (Figure 3-6). The industry-wide measures are heavily weighted by the relatively large number of Asia Pacific, European and North American airlines, so it is no surprise that these regions report traffic growth close to the industry levels. The feature that stands out is the performance of Asia Pacific carriers, who managed strong industry-level growth in traffic while only increasing capacity offered at around half that rate.

The Middle East was again the leading region in terms growth in capacity and passenger traffic, although here the increase in capacity was very slightly above traffic growth.

Figure 3-6: Growth in IATA total international RPK and ASK, 2005-2006

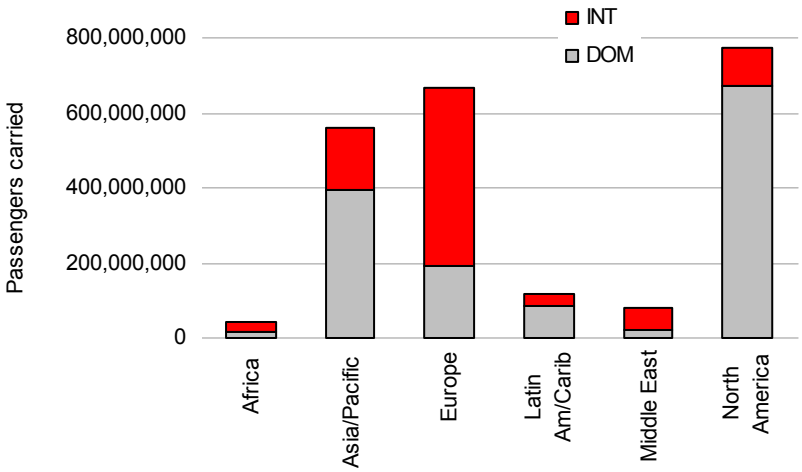


Source: IATA

Latin American airlines saw the high growth rate in passenger traffic of the previous year (up 11.4%) turn to a sharp contraction in 2006 (down 2.4%) due to restructuring of the industry in the region. North America suffered a decline in passenger growth when compared to 2005 levels, as carriers withdrew capacity in a pursuit of profitability rather than traffic.

ICAO records world passenger traffic by region (Figure 3-7). European registered airlines account for just under 30% of passengers carried in 2006, while the US domestic market alone accounts for a further 30% of world passengers. In terms of international traffic, European airlines carry 55% of the world total.

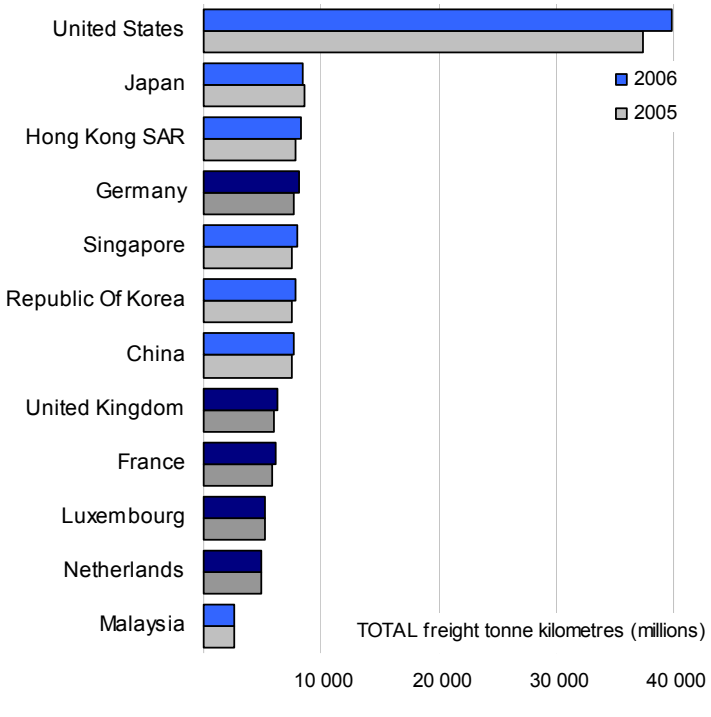
Figure 3-7: World regions: number of passengers carried, 2006



Source: ICAO

3.4.2 Air freight

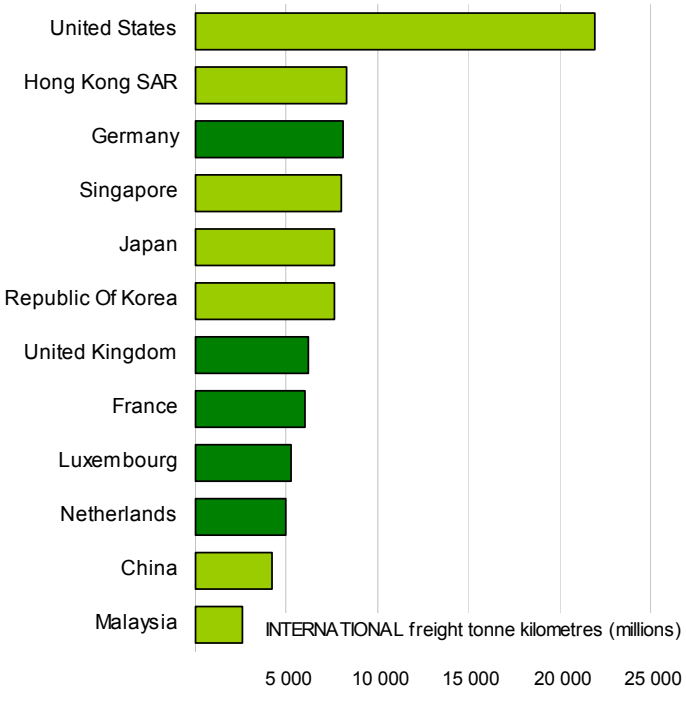
Figure 3-8: Top twelve countries / autonomous regions in terms of air freight, 2005-2006



Source: ICAO

The world league of air freight is dominated by the USA (Figure 3-8). France, Germany, Luxembourg, the Netherlands and UK are placed within the top twelve nations in terms of total (domestic and international) freight carried by their airlines. When only international freight is considered, the EU countries move up the ranking while the USA's lead shrinks significantly.

Figure 3-9: Top twelve countries in terms of INTERNATIONAL air freight, 2006



Source: ICAO

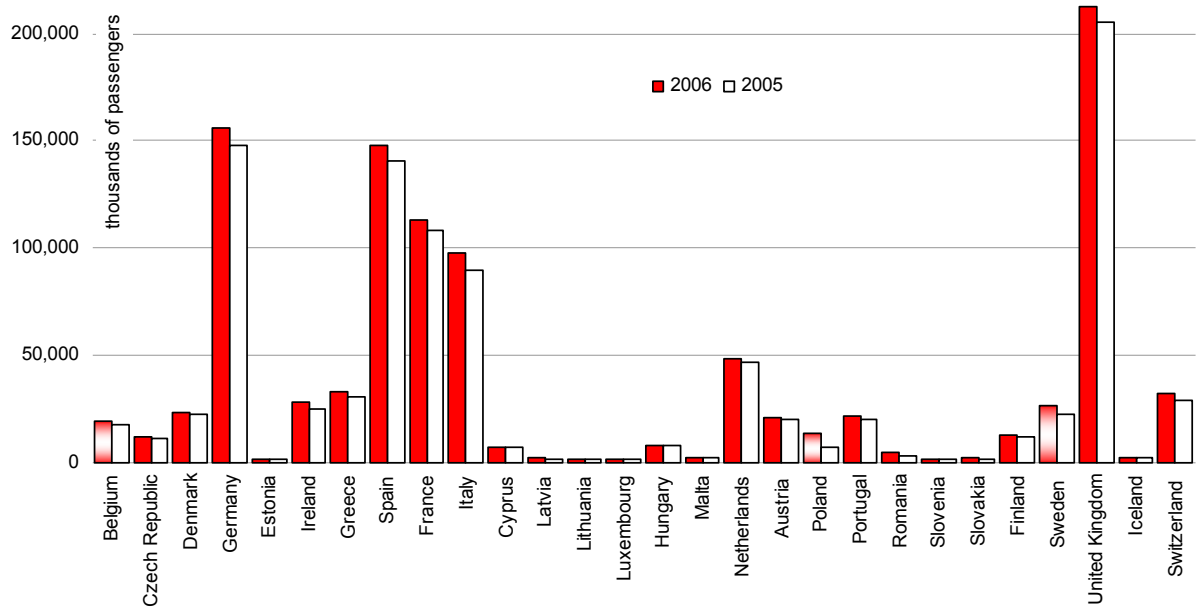
3.5 European passenger traffic

Figure 3-10 shows the passenger traffic generated by European states, provided by Eurostat. There is an element of double-counting, where cross-border intra-EU passengers are recorded as arrivals in one state and as departing passengers in the other. Clearly there is a strong, positive correlation between traffic volumes and the size of a country, its economic activity and its population, other factors such as tourism flows and the relative isolation of a nation also have an effect on passenger numbers. Within the EU-25, just under two-thirds of the passenger traffic generated involves airports in four states: UK, Germany, Spain, and France.

The leading positions occupied by UK and Germany reflect the dominance those two countries enjoy in the European development of the market for low-cost air travel, with the leading airlines this field operating multiple bases in UK and in Germany. Spain, as Europe's principal leisure destination, attracts the services of many low-cost and charter carriers to its Mediterranean and Canary Island airports, and has attracted a number of carriers to establish bases in the country.

Traffic statistics recorded by Eurostat can be somewhat distorted where data include traffic from airports not previously reporting. In most cases the consequent distortion is insignificant, but this is not so in the case of Poland, and to a lesser extent Belgium and Sweden, where 2006 traffic includes data from a number of newly reporting airports. Further reference is made to this in the paragraph below referring to annual growth rates.

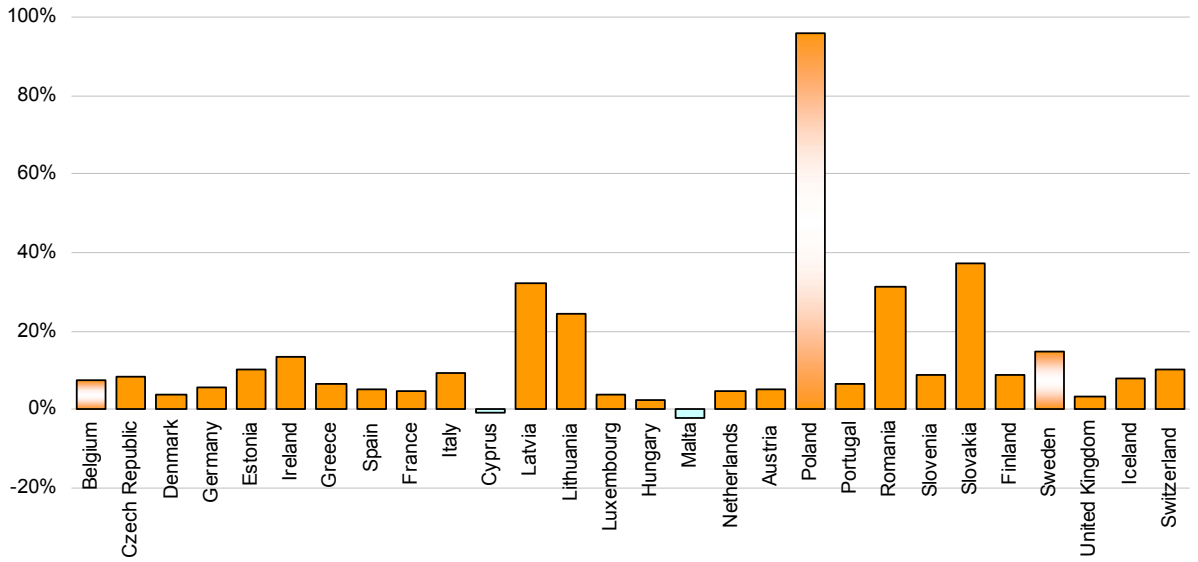
Figure 3-10: European air passenger traffic, 2006 and 2005



Source: Eurostat

The wide differences in traffic volumes among the countries represented in Figure 3-10 mask the very high year-on-year growth recorded by countries with relatively low levels of passenger traffic. Figure 3-11 shows the extent to which passenger traffic changed between 2005 and 2006.

Figure 3-11: Change in air passenger traffic, 2005-2006



Source: Eurostat

The impacts of two factors are apparent. Candidate states, and the newer member states, generally enjoyed very high rates of growth, albeit from relatively low levels of activity, coming from their involvement in a deregulated air transport environment, opening of borders and increasing economic activity. Latvia, Lithuania, Poland, Romania and Slovakia all recorded rates of increase in passenger traffic of over 20%.

Eurostat statistics are aggregates of airport traffic data. Changes in reporting airports are normally of no great significance to national air traffic totals, but in the case of Poland a very substantial part in the increased traffic reported between 2005 and 2006 can be attributed to Gdansk, Krakow, Katowice, Poznan and Wroclaw joining Warsaw as reporting airports. Warsaw itself, the only reporting Polish airport in 2004 and 2005, increased traffic by around 14% in 2006. The focus of LCC on provincial airports in Poland suggests that passenger traffic for all Polish airports increased at a rate substantially above that recorded by Warsaw.

Belgium's traffic statistics are boosted by Antwerp and Liege joining Brussels and Charleroi as reporting airports, while changes in the constituent airports in Swedish traffic reports also distort national statistics somewhat. Adjusting the traffic data to reflect like-for-like, i.e. including only airports reporting in both years, Belgium's growth rate drops from 7.8% to 5.4%, and Sweden's 11.8% increase falls by three-quarters to 2.8%.

Malta recorded a decline in passenger traffic, for the second consecutive year. Changing patterns in tourism also had an impact on Cyprus air transport, where the 2005/2006 drop was just over half of one percent.

Table 3.5: Passenger flows between EU states, in thousands of passengers, 2006

	AT	BE	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	SE	SI	SK
BE	398																							
CY	116	60																						
CZ	171	219	79																					
DE	4,972	1,254	368	1,134																				
DK	358	438	66	232	2,052																			
EE	9	25	1	84	215	142																		
ES	1,017	3,345	6	609	20,899	1,657	40																	
FI	189	242	63	131	1,312	788	199	841																
FR	813	975	135	754	6,920	1,183	16	6,813	420															
GR	981	799	1,072	672	4,796	645	26	415	302	1,453														
HU	85	227	70	163	1,512	204	< 1	267	171	484	307													
IE	201	420	59	259	1,436	172	18	3,040	48	1,738	131	168												
IT	844	2,257	80	732	10,583	846	28	8,447	309	6,964	2,258	575	1,066											
LT	38	27	4	98	218	218	39	19	76	20	31	3	136	20										
LU	47	1	< 1	12	195	83	< 1	230	< 1	170	57	7	< 1	113	< 1									
LV	49	36	3	92	368	165	32	29	181	25	21	< 1	189	43	21	< 1								
MT	63	78	53	7	362	49	1	30	17	144	30	18	27	415	< 1	5	1							
NL	464	245	113	376	2,735	975	48	4,620	437	2,186	1,519	381	775	2,710	76	72	101	76						
PL	217	257	47	143	2,332	324	17	361	125	683	382	156	736	836	68	< 1	31	10	321					
PT	89	606	5	39	2,324	196	3	2,334	94	2,022	11	32	560	926	< 1	142	< 1	7	1,026	47				
SE	286	429	184	155	2,175	1,745	157	1,747	1,422	1,052	696	212	163	586	61	< 1	159	28	889	340	158			
SI	74	67	2	33	204	21	< 1	18	< 1	115	86	20	3	8	< 1	< 1	< 1	6	14	6	< 1	< 1		
SK	31	34	12	213	192	21	< 1	54	< 1	141	153	< 1	76	233	< 1	< 1	< 1	< 1	59	7	< 1	< 1	< 1	
UK	1,781	1,614	3,009	2,153	11,465	2,321	133	34,600	903	11,849	5,522	1,000	12,297	10,604	276	211	409	1,015	8,264	3,098	4,741	2,340	183	456

Source: Eurostat

Table 3.5 shows passenger flows between pairs of EU states in 2006. In the table, intersects with over five million passengers are highlighted with a border, while those recording less than one thousand passengers in the year are shown in a lighter font. Passenger flows are the average of arriving passengers and departing passengers reported by each state. The two countries generating the most passenger traffic between them are Spain and the UK, followed by Germany and Spain.

States with significant levels of scheduled domestic air transport can be seen in Table 3.6, wich shows passenger growth over 2005. Total increase in passenger traffic was 4.2%, pushed upwards by growth in the very large markets of France and Spain (up 5.6% and 6.6%, respectively), although the size of the UK domestic market shrank slightly.

Table 3.6: Passenger traffic on domestic scheduled services, European states, 2005 - 2006

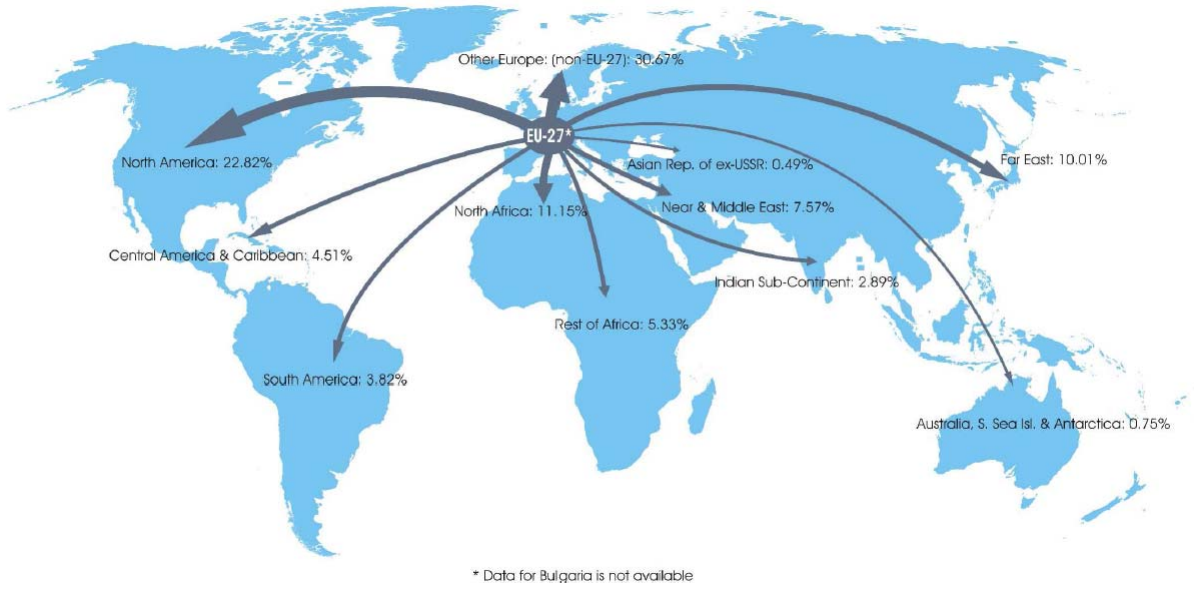
	2005	2006	change
Austria	598,572	641,659	7.2%
Cyprus	85,313	86,817	1.8%
Czech Republic	186,007	246,580	32.6%
Denmark	1,558,631	1,695,238	8.8%
Estonia	21,027	21,200	0.8%
Finland	2,817,599	2,899,779	2.9%
France	25,168,595	26,578,531	5.6%
Germany	22,650,367	23,268,871	2.7%
Greece	5,715,291	6,073,878	6.3%
Ireland	975,216	1,197,129	22.8%
Italy	24,689,264	26,504,495	7.4%
Lithuania	17,531	3,984	-77.3%
Netherlands	79,526	51,464	-35.3%
Poland	864,833	929,490	7.5%
Portugal	2,905,644	2,413,971	-16.9%
Romania	280,668	411,343	46.6%
Slovakia	62,910	115,693	83.9%
Spain	37,404,668	39,874,562	6.6%
Sweden	7,299,066	7,173,857	-1.7%
Switzerland	740,204	709,453	-4.2%
United Kingdom	26,013,298	25,881,861	-0.5%

Source: Eurostat

Figure 3-12 demonstrates the important cultural and economic links between EU states and North America. North Atlantic routes carry more than one in five passengers leaving the EU, second only as a destination to Europe destinations outside the EU.

Passenger traffic to destinations outside the EU increased by 5.3% in 2006 (Table 3.7). The powerful traffic generation of the hub airports of France, Germany and the UK is evident.

Figure 3-12: Extra-EU-27 passenger transport by world region, 2006



Source: Eurostat

Table 3.7: Passenger traffic on international ex-EU services, EU-25, 2005 and 2006

	2005	2006	change
Austria	6,965,196	6,926,457	-0.6%
Belgium	4,978,978	5,168,018	3.8%
Cyprus	1,267,926	1,301,279	2.6%
Czech Republic	3,018,175	3,357,415	11.2%
Denmark	6,290,078	6,255,475	-0.6%
Estonia	179,875	233,238	29.7%
Finland	1,954,184	2,149,115	10.0%
France	38,299,923	39,765,134	3.8%
Germany	50,891,598	52,463,316	3.1%
Greece	3,637,606	4,194,925	15.3%
Hungary	2,085,272	2,249,908	7.9%
Ireland	2,592,712	2,951,862	13.9%
Italy	17,748,988	19,213,002	8.2%
Latvia	299,468	485,659	62.2%
Lithuania	237,354	299,528	26.2%
Luxembourg	225,297	253,108	12.3%
Malta	295,700	257,956	-12.8%
Netherlands	20,213,110	20,193,121	-0.1%
Poland	1,604,084	2,624,193	63.6%
Portugal	3,262,956	3,526,989	8.1%
Slovakia	378,354	372,536	-1.5%
Slovenia	431,311	463,938	7.6%
Spain	14,406,964	16,578,881	15.1%
Sweden	3,893,269	4,084,958	4.9%
United Kingdom	61,747,113	64,505,359	4.5%

Source: Eurostat

Together these nations account for more than six out of every ten passengers traveling outside the EU. The networks established by national carriers focus passenger flows from certain states on particular regions of the world. For example, while Spain accounts for 40% of all passenger departures between EU and South America, Portugal dominates the Brazil market. On routes between the EU and North America, 38% of all passengers used UK airports as their entry/exit points.

European network carriers

Not surprisingly, the traffic carried by AEA airlines mirrored the world picture. Their system-wide passenger numbers advanced by 7.4% while passenger-kms rose by 6.2%, indicating a small fall in the average passenger trip length (Table 3.8). Europe's carriers performed most strongly in terms of RPK on routes to Australia and the Pacific, where traffic was up by 9.8% over 2005. On the important North Atlantic a 2.0% increase in capacity was met by 0.7% increase in traffic, generating a drop in passenger load factor of just over one decimal point, to 81.5%.

European routes (domestic and cross border) carried 78% of AEA airlines' passengers, but just 31% in terms of RPK. The North Atlantic had the most important international routes in terms of RPK, with a quarter share of AEA airlines' total.

Table 3.8: Performance of AEA members, 2006

	Passengers thousands	RPK milions	ASK milions	passenger load factor	TFTK millions
Domestic	108,906	59,494	88,509	67.2%	127.2
Europe cross border	158,674	166,825	240,851	69.3%	760.0
Europe to N Africa/M East	11,069	31,964	45,396	70.4%	1,182.4
North Atlantic	27,504	187,928	230,479	81.5%	10,254.7
S and Mid Atlantic	11,273	91,414	108,917	83.9%	3,800.5
Europe - rest africa	7,686	51,186	65,683	77.9%	3,055.6
Europe - Far East/Australia	17,779	147,548	182,765	80.7%	17,288.1
other	862	612	1,081		
TOTAL	**343,753**	**736,972**	**963,681**	**76.5%**	**36,507.9**

Source: AEA

On Asia/Pacific services, passenger numbers and RPK produced were up by 11% and 10% respectively. An 8.4% increase in capacity supplied (ASK), below the increase in RPK, resulted in average increase of one decimal points in passenger load factor.

Table 3.9: Scheduled passenger services of AEA members, 2006 vs 2005

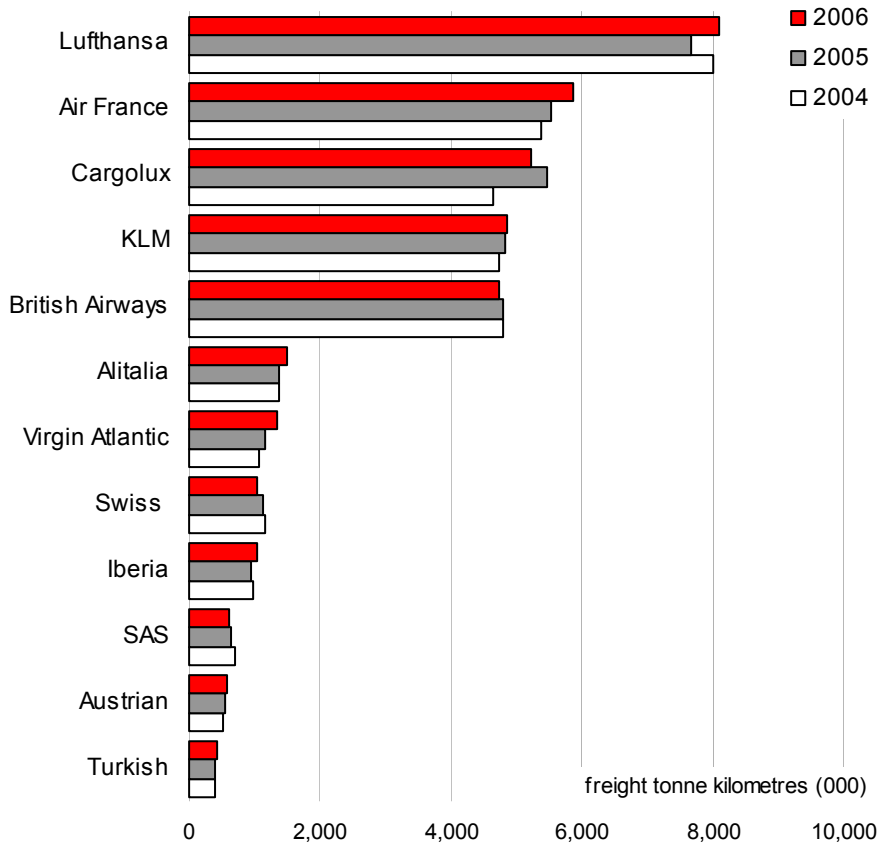
	Passengers	RPK	ASK	LF	TFTK
				decimal points	
Domestic	7.7%	9.1%	7.4%	1.0	-5.5%
Europe cross border	7.8%	8.9%	6.1%	1.8	-6.0%
Europe to N Africa/M East	6.2%	7.8%	9.9%	-1.4	7.3%
North Atlantic	0.5%	0.7%	2.0%	-1.1	3.0%
S and Mid Atlantic	7.9%	7.1%	4.9%	1.8	2.0%
Europe - rest africa	4.1%	3.0%	3.0%	0.0	4.6%
Europe - Far East/Australia	11.3%	9.8%	8.4%	1.0	2.7%
TOTAL AEA	**7.4%**	**6.2%**	**5.5%**	**0.5**	**2.7%**

Source: AEA

Total freight tonne-kilometres (TFTK) was up system-wide by 2.7%, although the relatively small intra-European markets were down by six percent.

Lufthansa resumed its growth in air cargo traffic in 2006 (Figure 3-13), maintaining its lead amongst European carriers. Air France is still the second largest cargo airline and enjoyed some growth in 2006 in contrast to Cargolux, an all-cargo operator, which underwent some retrenchment. The integrated carriers such as FedEx, DHL, UPS and TNT do not report separate figures for their tonne-km traffic carried by air, and in fact use a number of different suppliers including the airlines shown in the graph. Traffic carried on the integrators' own services to, from and within Europe is small relative to that of the EU majors (and also relative to their US traffic)

Figure 3-13: Freight carried by major European scheduled carriers, 2004-2006



Source: AEA

Section 4

Airlines

4 Airlines

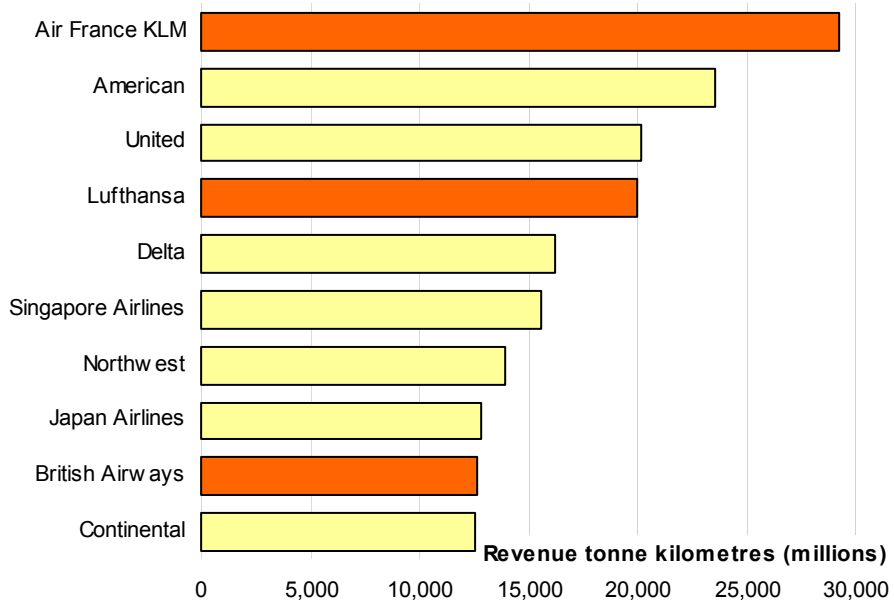
4.1 Airline traffic

When measured in terms of the number of passengers carried on international flights, European carriers (including LCC Ryanair and easyJet) take lead positions in the league of world airlines. If domestic traffic is considered, the size of the US, Chinese and Japanese markets means airlines from those countries dominate the ranking of passengers carried.

However, measuring airline performance in terms of passengers is not a particularly good indicator of the scale of air transport development, ignoring the contribution of cargo operations and of the lengths of sectors operated. *Revenue tonne kilometres* (RTK) include these additional dimensions, while *operating revenue generated* adds the important element of financial contribution.

European carriers performed 30% of world RTK in 2006, while North American airlines produced 33%. Of the European performance, just over three-quarters came from scheduled international operations, while these accounted for only 17% of North American performance. Figure 4-1 shows the sum of passenger and freight RTK (including both international and domestic operations) performed by the top ten world airlines,.

Figure 4-1: The position of European carriers among the world's top airlines in terms of total RTK performed in 2006

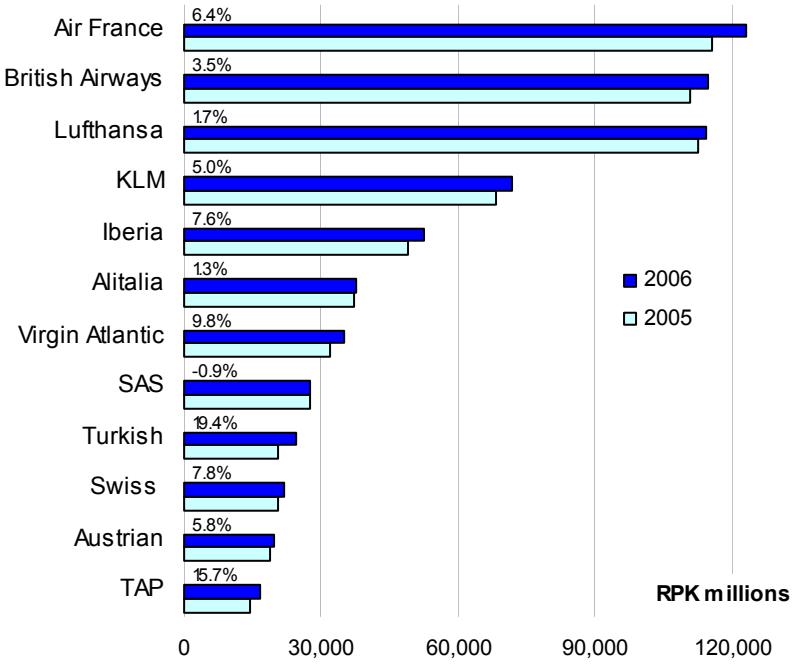


Source: ICAO

Ranking regions of the world by the total operational revenue generated by airlines registered in those regions shows that European airlines create approaching one-third of world airline revenue. This share of world operating revenue increased from 28.9% in 2000 to 31.3% in 2006. In absolute terms the average increase in European airline revenues was 6.8% per annum over the six year period.

Figure 4-2 shows the traffic generated in 2006 and 2005 by the twelve top performing AEA airlines. Air France, British Airways and Lufthansa generally cluster at the top of the league, jockeying for top position. In 2006 Air France increased its RPK by 6.4%, moving ahead of its competitors.

Figure 4-2: Scheduled service RPK of selected AEA members, 2005 & 2006, with % change



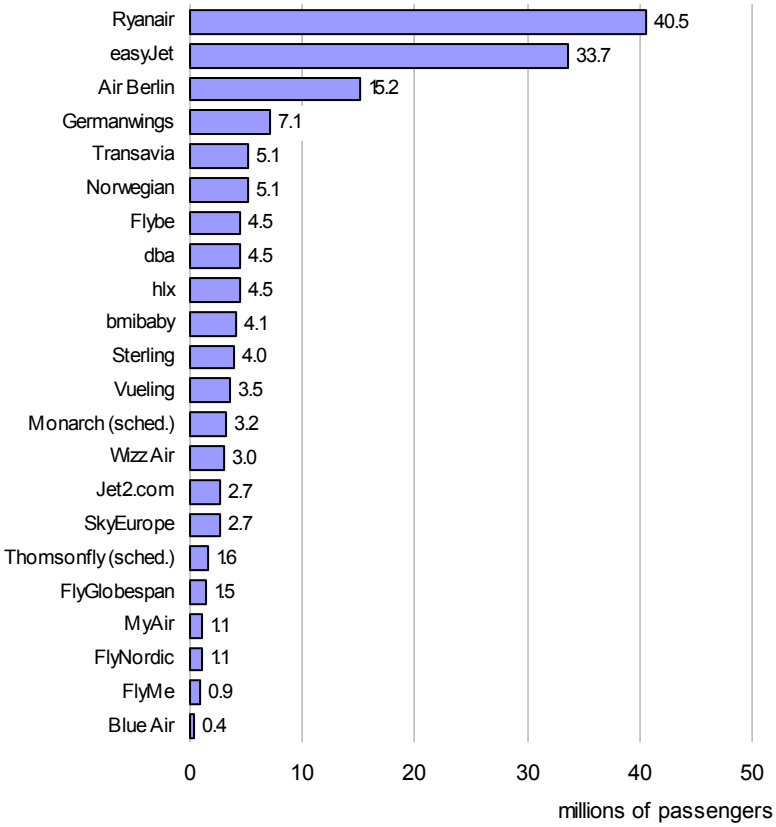
Source: AEA

All but one these twelve airlines experienced growth in 2006. SAS recorded a small fall in RPK, down by just less than one percent over 2005. An average RPK growth across AEA airlines of 5.7% was comfortable beaten by Turkish and TAP, both recording double-digit growth in RPK.

European low cost carriers (LCCs)

In 2006 the total number of passengers carried on low-cost airlines on intra-European routes was in excess of 150 million, an increase of around 30% on 2005. Figure 4-3 shows the continued dominance of Ryanair and easyJet who transported nearly 50% of all passengers travelling on scheduled low-cost flights in 2006. Air Berlin's clear third place is due to the inclusion this year of its charter traffic which still accounts for a significant proportion of its business. Transavia's more prominent position is also down to the inclusion of its charter traffic. On both of these airline seats are available for 'seat-only' purchase on most of the charter routes operated. Smaller LCCs for which no traffic figures were available for 2006 were Blu-Express, Centralwings, niki, Virgin Express, Volareweb and Windjet.

Figure 4-3: Total scheduled passengers by LCC, 2006



Source: Airline reports, Airline websites, Cranfield estimates

Ryanair again grew twice as fast as easyJet in 2006, increasing its passengers by 22% compared to easyJet's 11%. Ryanair grew by 7.2 million passengers which is more passengers than fourth ranked Germanwings carried across its entire network. Other LCCs grew very rapidly to try and establish critical mass. Leading the way were Vueling (+75%), FlyGlobespan (+57%), Norwegian (+55%), SkyEurope (+48%), Wizz Air (+40%) and Germanwings (+31%). Average annual load factors for the top six were 80% or above showing how fares can stimulate demand in off-peak months, days and even times of day.

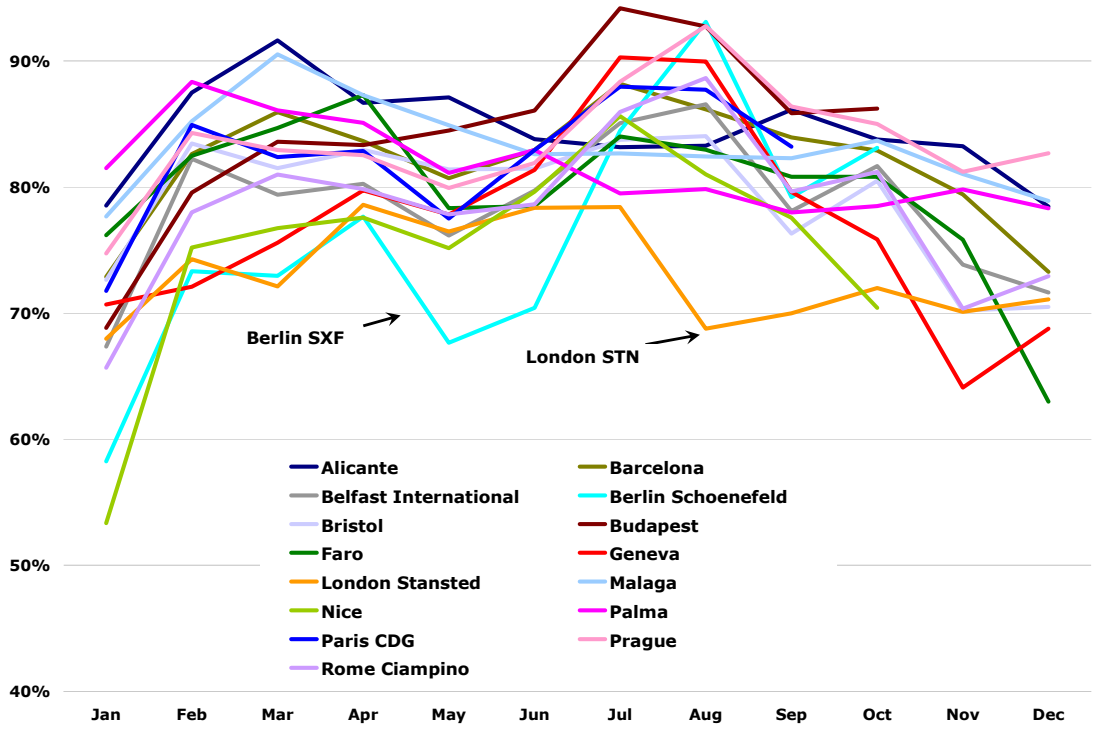
Europe's LCCs established a number of new bases across Europe in 2006. These included:

- easyJet at Milan Malpensa (10 March)
- FlyMe at Gothenburg (30 March)
- Norwegian at Warsaw (13 July)
- Ryanair at East Midlands (7 March), Marseille (8 November) and Madrid (22 November)
- SkyEurope at Prague (10 April)
- Smartwings at Budapest (29 October)
- Sterling at Helsinki (27 March: aborted less than five months later)
- Transavia at Eindhoven (30 October)

Compared with last year when most of the new bases were established in the airline's home country this year's bases show a determination by LCCs to look further afield and develop networks where demand and existing services suggest a potential for new growth.

Figure 4-4 and Figure 4-5 show details of individual route performance (measured by monthly load factor) for two quite different airlines within the low-cost spectrum.

Figure 4-4: easyJet load factors on routes from Newcastle 2006

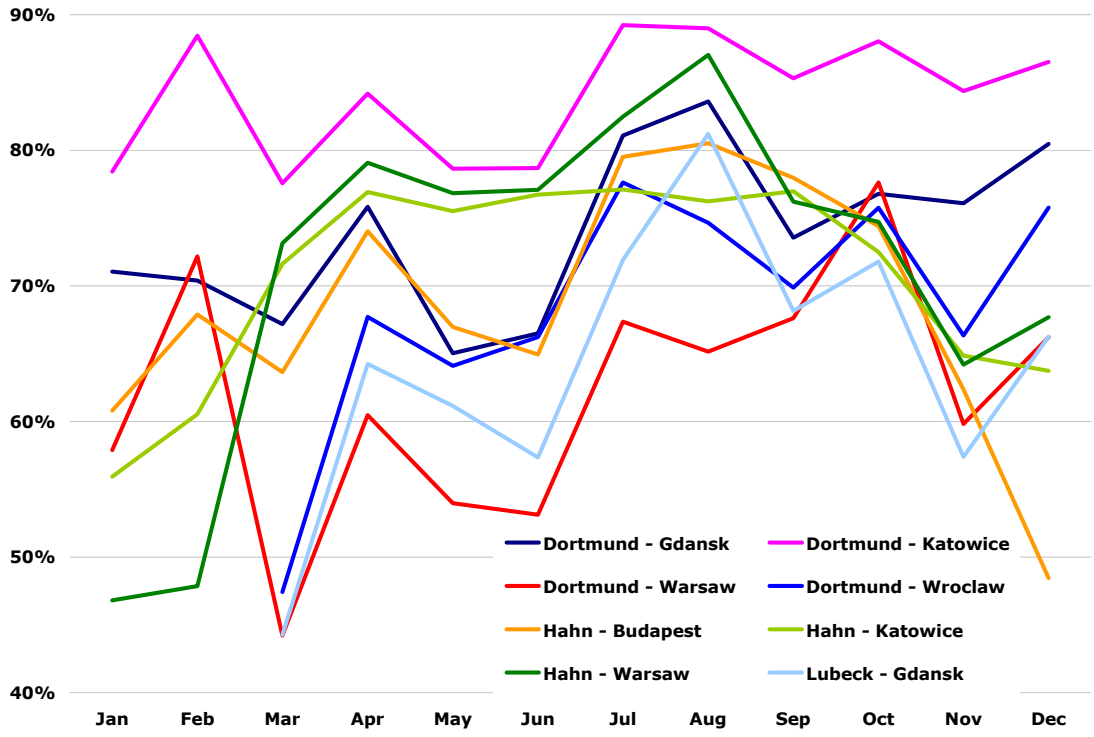


Source: UK CAA Airport data (assumes all services operated by 149-seat B737s)

EasyJet started a base at Newcastle in March 2003 with routes to Alicante, Barcelona and Belfast. Since then the base has grown to serve 16 routes. Figure 4-4 shows the seasonality of the various destinations served. Impressively only in January, November and December do load factors fall significantly below 80%. During the rest of the year load factors are fairly similar: what does vary from month to month is the average fare paid by passengers, reaching a maximum on most international routes during the peak summer vacation period. The relatively poor performance of the route to Berlin helps explain why the route was dropped at the end of the summer season. It should be noted that the London Stansted route which performs less well in August and September is served four times per day, increasing to five times per day for the later months.

The second set of routes analysed in more detail are those operated by Wizz Air from various Polish airports (and Budapest) to German airports in 2006. Wizz Air is headquartered in Budapest but has operating bases in Poland, Hungary and now Romania. After the UK, the German market is the second biggest Western European market served by the airline.

Figure 4-5: Wizz Air load factors on routes to/from Germany in 2006



Source: destatis data (assumes all services operated by 180-seat A320s)

Of the eight routes, two were started in March 2006 and their progress from start-up to a level of maturity can clearly be seen in the graph. The route between Dortmund and Katowice has the highest load factor in every month, an impressive achievement considering that it also has the highest frequency of any of the routes. The Germany - Poland market is characterised by strong VFR traffic so the traditionally quiet months around Christmas perform well for the airline, though with reduced frequencies compared with summer months. The average load factor is several points lower than for easyJet's Newcastle base, and there is more variation between routes, but given the larger aircraft size the average number of passengers per flight is actually greater for Wizz Air at 131 than for easyJet with 118. Only Dortmund to Katowice is served daily year round so any business passengers on these routes have to be fairly flexible about travel dates. However, as far as Wizz Air is concerned business traffic is a bonus as the airline's cost base is low enough to be able to focus on stimulating new leisure and VFR demand with low fares.

Charter/leisure airlines

In 2006, there were 107 charter airlines based in Europe[3] operating commercial services with aircraft seating over 50 passengers[4]. The average length of time these carriers had been in existence is 10 years. Table 4.1 provides a listing of the 107 carriers; indicating country of

[3] Europe here includes the 25 EU Member States, Bulgaria, Croatia, Iceland, Norway, Romania, Switzerland and Turkey.

[4] Air Berlin is excluded from this listing, given its low cost scheduled services focus. It does however continue to operate a significant number of charter services.

registration, date established and fleet size. As may be seen, the countries with the largest number of passenger charter airlines are the Turkey (14), Spain (13) and the UK (12). The fleets operated by the 107 airlines totaled 846 aircraft, of which 209 were flown by UK carriers, 132 by German carriers, 110 by Turkish carriers and 89 by Spanish companies. The charter airlines owned by tour operators accounted for 39% of these aircraft, with 39% operated by independent carriers and 22% by carriers owned by other airlines. In 2006, the charter airlines owned by tour operators for which data could be obtained accounted for 50.1% of passengers.[5]

Table 4.1: Europe's Passenger Charter Airlines in 2006

		Started	Fleet size	Comments
Austria	LTU Austria	2004	1	
	MAP	2002	9	
Belgium	Jetairfly	2004	9	
	Thomas Cook (Belgium)	2002	6	
Bulgaria	BHAir	2001	7	
	Bulgarian Air Charter	2000	11	
	VIA	1990	3	
Croatia	Air Adriatic	2000	6	
	Dubrovnik Airline	2005	5	
	Trade Air	1994	2	
Cyprus	Eurocypria	1990	4	
Czech	Travel Service Czech	1997	7	
Denmark	MyTravel A/S	1994	11	
Finland	Air Finland	2002	3	
France	Aigle Azur	1970	9	
	Air Mediterranee	1997	9	
	Axis Airways	2001	4	
	Blue Line	2002	4	
	Corsair	1981	11	
	Eagle Aviation	1999	4	
	XL Airways France	1995	5	Previously named Star
Germany	Blue Wings	2002	5	
	Condor	1955	22	
	Condor Berlin	1997	14	
	Germania	1978	-	Operates for other airlines
	Hamburg Int'al	1998	7	
	LTU	1955	27	
	Privatair Gmbh	2003	4	
	TUIfly.com	1972	50	Previously named Hapagfly
	XL Airways Germany	2006	3	
Greece	Alexandair	2005	1	
	Greece Airways	2003	1	Ceased operations 11/06
	Hellas Jet	2002	1	
	Hellenic Imperial A/ways	2006	1	
	Sky Wings	2004	1	
Hungary	Travel Service Hungary	2001	1	
Iceland	Air Atlanta Icelandic	1986	23	
	Jet X	2004	3	
Ireland	EIR Jet	2004	3	Ceased operations 10/06
Italy	Air Europe	1989	1	
	Air Italy	2005	4	
	Blue Panorama	1998	6	
	Eurofly	1989	13	
	Itali Airlines	2003	3	
	Livingston	2003	6	
	Neos	2001	6	
Latvia	LAT Charter	1993	2	
Lithuania	Aurela	1996	2	
Netherlands	Arkefly	2004	5	
	Interstate Airlines	2005	1	
	Martinair	1958	15	
	Transavia	1966	27	
Poland	Prima	2005	1	
	White Eagle	1992	3	
Portugal	EuroAtlantic	1993	7	
	Luzair	2000	2	
	White	2000	1	
Romania	Jetran Air	2005	6	
	Romavia	1991	5	
Spain	Airclass Airways	2003	2	
	Air Madrid	2003	6	Ceased operations 12/06
	Air Plus Comet	1996	10	
	Audeli	2006	7	
	Flightline SL	2006	2	
	Futura	1989	23	
	Girjet	2002	7	
	Hola	2002	4	
	Iberworld	1998	10	
	LTE	1987	5	
	Privilege Style	2003	1	
	Pullmantur Air	2003	3	
	Swiftair	1986	7	
Sweden	Falcon Air	1986	3	Ceased operations 9/06
	Fly Nordic	2004	9	
	Novair	1997	5	
	TUIfly Nordic	1997	5	
	Viking	2003	4	
Switzerland	Belair	2001	3	
	Edelweiss Air	1995	4	
	Hello	2004	6	
	Privatair	1977	6	
Turkey	Atlasjet International	2001	17	
	Best Air	2006	2	
	Corendon	2004	4	
	Fly Air	2002	9	Suspended operations 9/06
	Freebird	2001	5	
	Golden International	2005	1	
	Inter Airlines	2002	4	
	Onur Air	1992	29	
	Pegasus	1990	15	
	Saga Airlines	2004	3	
	Sky Airlines	2001	6	
	Sunexpress	1990	12	
	Tarhan Tower Airlines	2005	2	
	World Focus Airline	2004	3	
UK	Air Atlanta Europe	2002	1	Merged into XL Airways 04/06
	Astraeus	2001	10	
	European Air Charter	1993	6	
	First Choice	1986	31	
	Flightline	1989	7	
	FlyJet	2002	2	
	Monarch	1967	28	
	MyTravel	1986	21	
	Thomas Cook (UK)	1998	24	
	Thomsonfly	1962	47	
	Titan	1988	9	
	XL Airways	1994	19	Previously named Excel

Sources: JP Airline-Fleets International, ICAO, IATA, ATI, Airline Business, DGAC France, UK CAA.

Table 4.2 provides 2006 traffic statistics for 48 of the 107 carriers referred to in the previous table, sufficient data being unobtainable for the remaining airlines. Overall, the number of passengers carried by these 48 companies increased by 2.7% in 2006 compared to the previous year. In terms of RPK, the equivalent increase was 2.6%.

[5] This figure relates to the 54 airlines for which data could be obtained.

Table 4.2: Europe's charter airlines' demand in 2006, and change over 2005

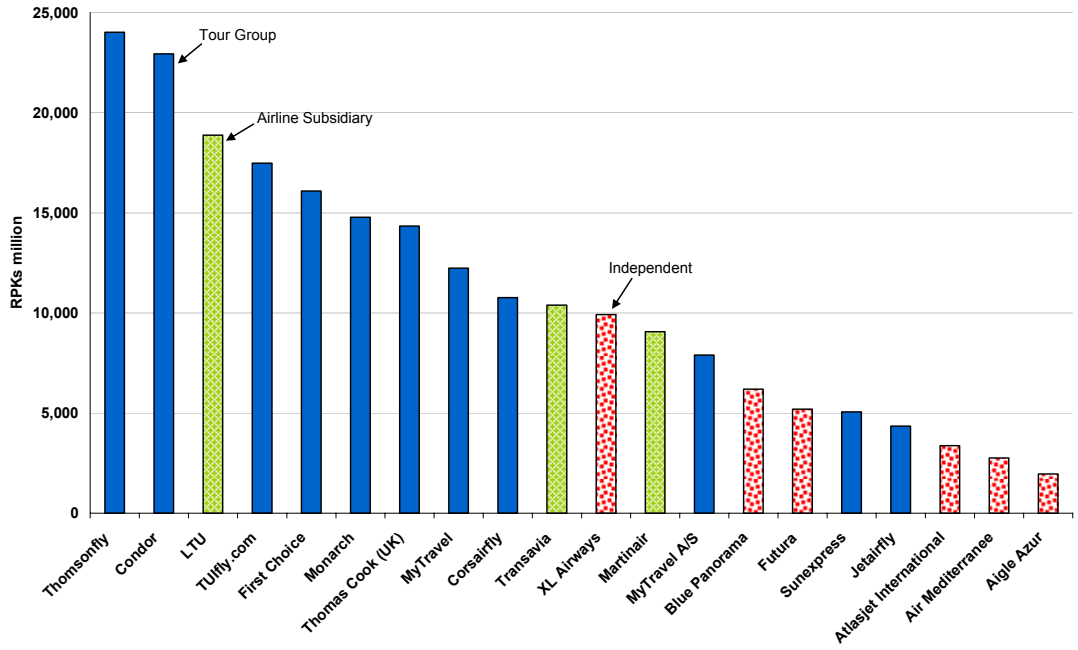
Airlines	passengers		RPK	
	millions	% change	millions	% change
Thomsonfly	9.617	0.7%	24,019	2.9%
Condor	7.696	4.3%	22,945	3.2%
TUIfly.com	6.700	-8.3%	17,483	1.4%
Monarch	5.788	7.1%	14,781	9.1%
LTU	5.751	2.7%	18,876	3.7%
First Choice	5.517	-8.0%	16,091	2.3%
Transavia	5.140	7.1%	10,397	4.5%
Thomas Cook (UK)	4.873	-1.3%	14,344	-0.1%
MyTravel	3.568	-18.6%	12,239	-11.4%
Atlasjet International	3.370	24.4%	3,372	-0.7%
XL Airways	3.194	23.3%	9,919	29.9%
Futura	2.980	20.6%	5,194	15.2%
Sunexpress	2.358	33.6%	5,062	23.5%
MyTravel A/S	2.040	-2.9%	7,900	5.3%
Martinair	1.707	-9.7%	9,068	-3.0%
Corsairfly	1.636	-19.4%	10,766	-14.7%
Jetairfly	1.600	14.3%	4,348	15.0%
Air Mediterranee	1.314	49.7%	2,759	60.2%
Blue Panorama	1.300	27.5%	6,197	-22.5%
Aigle Azur	1.250	34.7%	1,960	23.0%
ArkeFly	1.220	-3.2%	2,992	91.8%
Travel Service Czech	1.205	-33.4%	2,079	-36.3%
Fly Nordic	1.181	-1.6%	973	64.9%
TUIFly Nordic	1.160	22.1%	4,292	31.2%

Airlines	passengers		RPK	
	millions	% change	millions	% change
Iberworld	1.128	-3.2%	4,275	9.0%
Livingston Energy Flight	1.113	113.2%	4,445	232.2%
Thomas Cook (Belgium)	1.020	2.0%	2,560	7.8%
Air Atlanta Europe	0.097	-82.5%	1,219	-75.8%
LTE	0.863	-1.4%	1,891	-11.1%
Astraeus	0.810	1.3%	2,862	-2.9%
Novair	0.800	n/a	3,816	7.7%
Hamburg Int'al	0.720	-1.4%	1,149	-4.9%
XL Airways France	0.688	-19.5%	2,788	1.1%
Hello	0.671	107.1%	1,745	107.0%
Edelweiss Air	0.613	6.8%	2,106	12.1%
Axis Airways	0.405	-1.0%	935	2.3%
Belair	0.346	-7.2%	1,103	-5.0%
FlyJet	0.269	-12.1%	876	-8.0%
Blue Line	0.254	-30.2%	378	n/a
Swiftair	0.231	216.6%	266	245.5%
Flightline	0.176	-6.9%	135	-4.3%
European Air Charter	0.162	-50.6%	266	-82.4%
LAT Charter	0.161	48.9%	496	83.7%
White	0.066	-36.3%	427	-22.8%
Titan	0.065	-67.8%	365	13.0%
Romavia	0.015	-45.6%	21	-34.4%
EuroAtlantic	0.010	-91.4%	55	-85.8%
Eagle Aviation	0.001	-97.8%	3	n/a
Total	**92.848**		**262,238**	

Sources: ICAO, IATA, ATI, Airline Business, DGAC France, UK CAA.

The top twenty airlines account for 83.4% of passengers carried by these 48 carriers and 83.0% of RPK. Figure 4-6 ranks the 20 carriers by RPKs, indicating which form part of a major tour-operating group, which are independent and which are owned by another airline.

Figure 4-6: Top 20 European charter airlines in RPKs in 2006



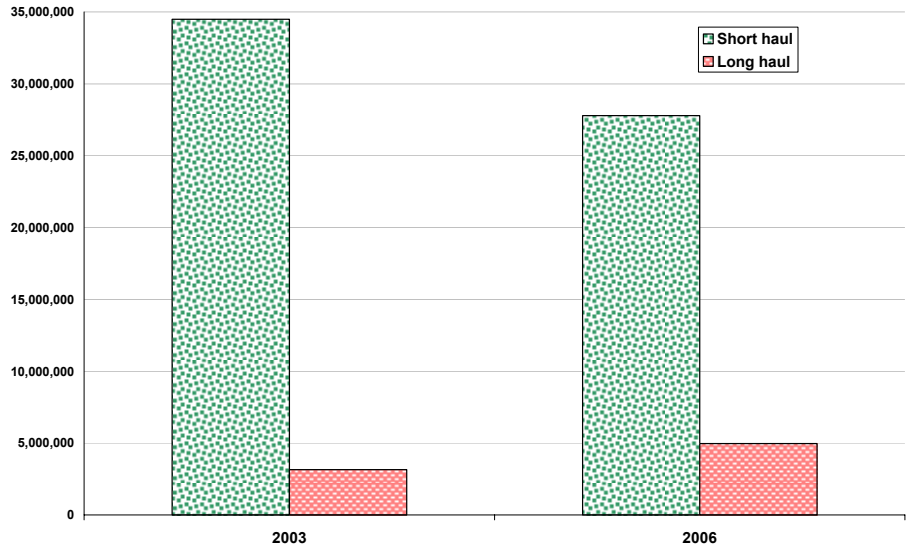
Sources: ICAO, IATA, ATI, Airline Business, DGAC France, UK CAA.

Key factors affecting operating and financial performance of LCC in 2006

The much greater flexibility provided by LCC in short haul markets continues to attract travellers away from the conventional charter product. Demand for short haul charter flights

from the UK fell by 20% between 2003 and 2006. This decrease has been partly offset though by an increase in passengers flying to long haul destinations (Figure 4-7).

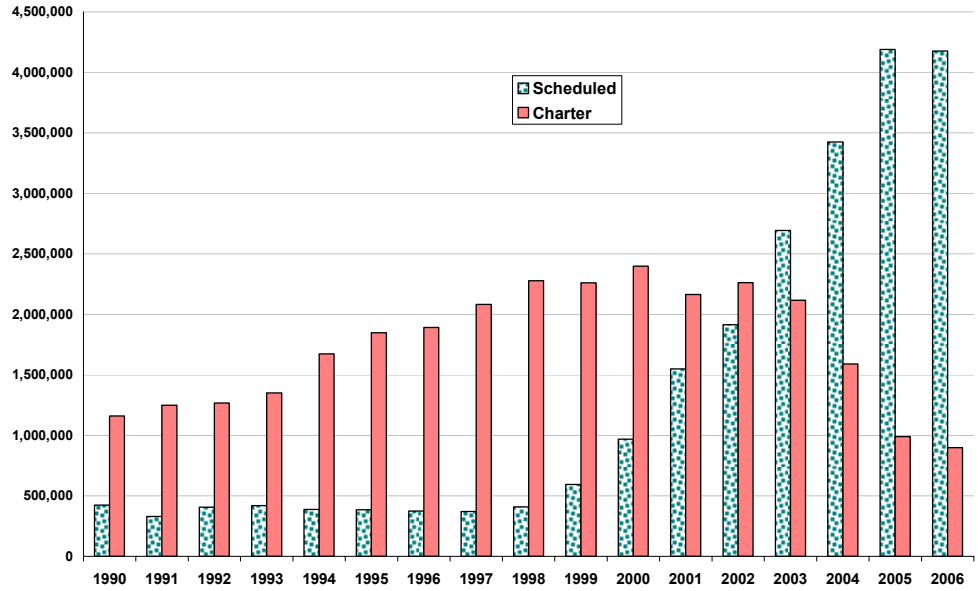
Figure 4-7: UK long and short haul charter demand 2003-2006



Source: UK Airports, CAA

A good example of the targeting of charter passengers by low cost carriers is shown by what has happened in respect of traffic to the UK's largest short-haul holiday destination, Malaga in southern Spain. Figure 4-8 shows the traffic split between scheduled and charter carriers between UK airports and Malaga between 1990 and 2006.

Figure 4-8: Passenger traffic between UK Airports and Malaga

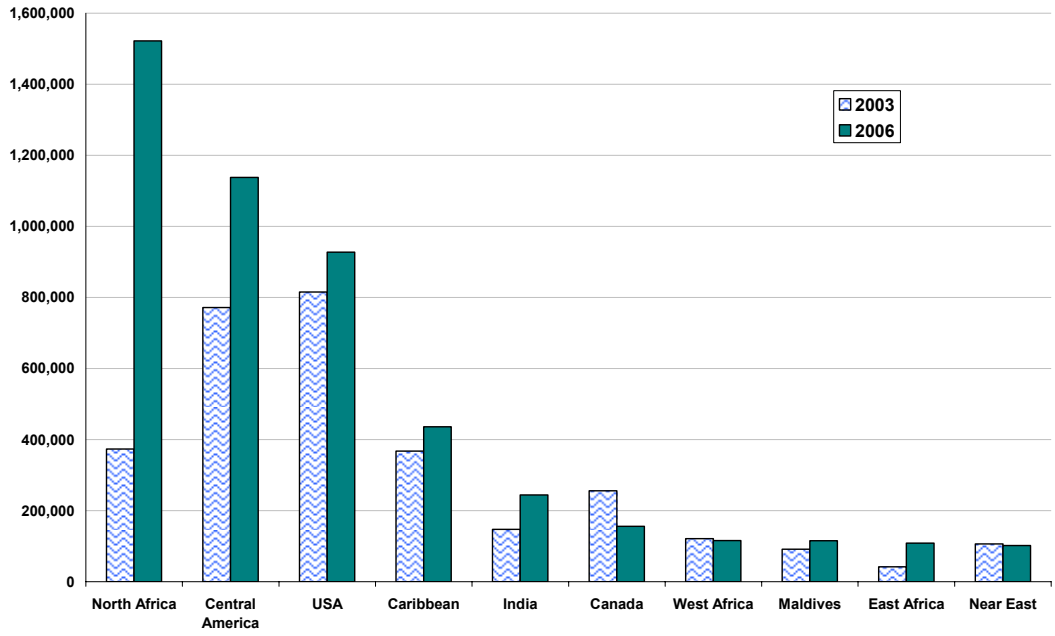


Source: UK Airports, CAA, 1990 - 2006.

Charter traffic peaked in 2000 with 2.4 million passenger journeys undertaken, but by 2006 this had fallen to less than 900,000. By contrast, scheduled traffic had quadrupled over the same period to over 4 million, nearly all of the increase attributable to low cost airlines.

There are as yet very few long haul services provided by low cost scheduled airlines. As such the long haul holiday market provides charter operators with opportunities for growth. Figure 4-9 shows the changes in traffic to long haul destinations from the UK between 2003 and 2006. Charter flights to North Africa, predominantly Egypt, and Central America, mainly Cuba, the Dominican Republic and Mexico, have increased substantially.

Figure 4-9: Changes in UK Long Haul Charter Demand 2003 - 2006



Source: UK Airports, CAA, 2003 - 2006.

The policy of tour operating groups adopting common branding for the various elements of their businesses became evident in respect to their charter subsidiaries from 2004, with TUI for example appending the word fly to the names of its airlines. The company has announced that all of its airline subsidiaries will adopt the name TUIfly from 2008. Various cost synergies are claimed from the common branding being adopted by many of the tour operating organisations.

Aside from a comparatively small number of aircraft intended as replacements, the only significant development has been the ordering of the Boeing 787 by Blue Panorama and First Choice. The latter airline has been re-equipping its long haul fleet with fewer seats, offering its customers a better quality of service. It has also been reducing its dependence on traditional short haul markets, concentrating instead on markets that the LCC have not encroached. This upmarket move has been followed by some other charter operators, but not by all. Monarch, for example, has rapidly expanded its short haul scheduled flights as demand for its charter operations have declined. Overall, charter fleets of the vertically integrated tour operators have not changed very much in 2006, the only significant downsizing being that of MyTravel.

With many former charter only airlines now providing large numbers of scheduled services, it is becoming increasingly difficult to separate charter operations and the economics thereof from their overall operating performance. Hybrid leisure carriers providing both types of service are continuing to grow, representing a flexible response to the changes in traditional charter markets resulting from the rapid growth of LCC.

4.1.1 Air Cargo

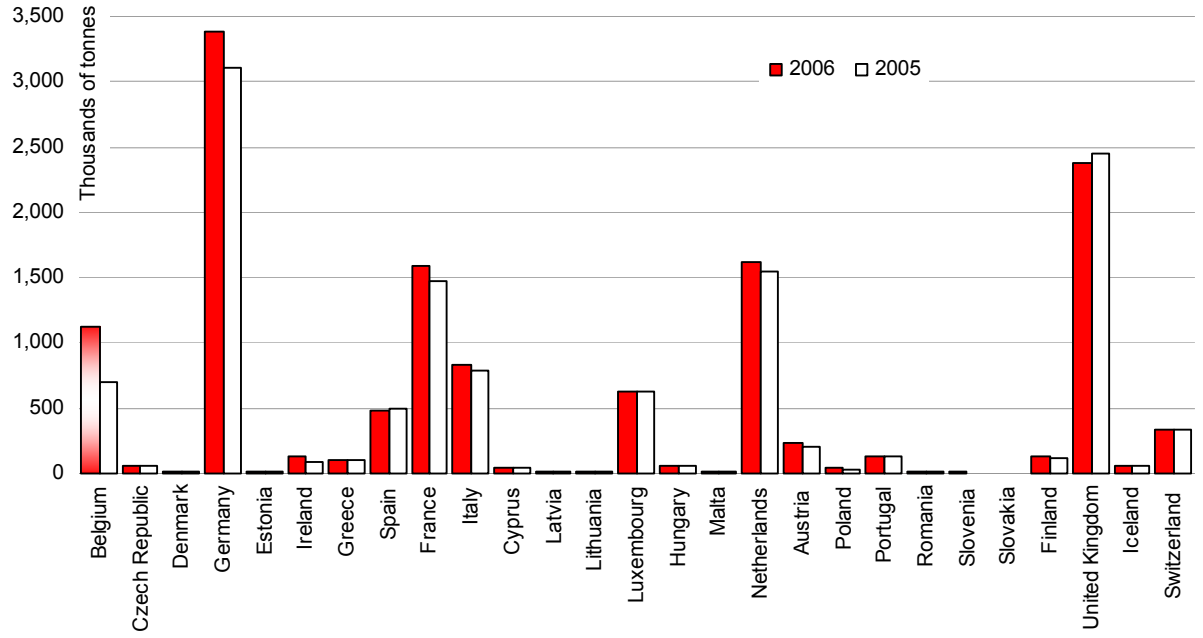
European overview

In 2006, just under twelve million tonnes of freight and mail were transported within the EU, and between the EU and other nations. This represented an increase of 7.9% over the amount carried in the previous year.

As in the case of passenger traffic, the overall figures mask very great differences in the traffic generated by European states (Figure 4-10). Within the EU-25, over half of all cargo traffic generated involves airports in just three countries: Germany (29%), UK (20%), and France (13%). Both Germany and France increased their freight and mail air transport over 2005 by around 9%, but the UK's cargo market fell 3%.

Some data exhibited in Figure 4-10 are distorted by the absence of key reporting airports in both of the years (the case of Swedish airports, and Copenhagen), or a change in the constituent airports reporting traffic figures to Eurostat (around one half of Belgium's 2006 freight throughput is accounted for by the newly reporting airports of Liege and Antwerp).

Figure 4-10: European air freight and mail transport by state, 2006 and 2005

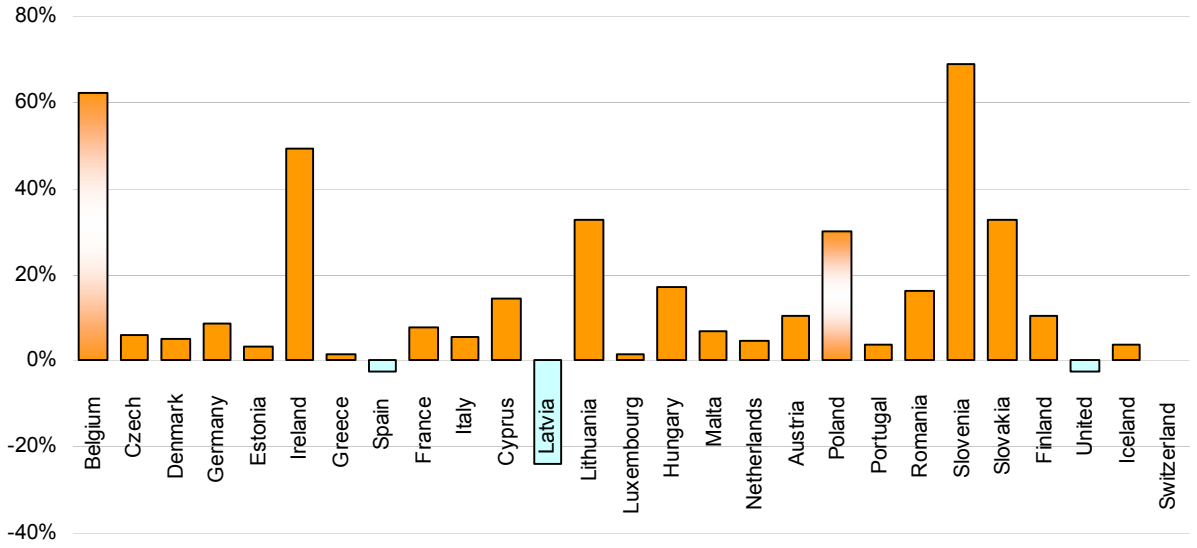


Source: Eurostat

The rates of growth between 2005 and 2006 in cargo traffic among the countries represented in Figure 4-10 are shown in Figure 4-11. The extent and variation in changes in cargo volumes generated by countries vary considerably. The apparent dramatic increase in Belgian freight is due to the inclusion of Liege in 2006 air transport statistics. In fact, on a like-for-like basis, Brussels (the only airport reporting freight traffic in both 2005 and 2006) increased its throughput by just 3.5%. In the same way, if Polish air cargo is considered from the base of Warsaw, its only reporting airport common to both years, annual growth represents a 19% increase over 2005.

In absolute rates of growth Slovenia was ahead of the other states, but from a very low base. Only Latvia (down 27%) and Spain (3% lower) joined the UK in recording reductions in the volumes of cargo generated.

Figure 4-11: Annual growth in air freight and mail, 2005-2006



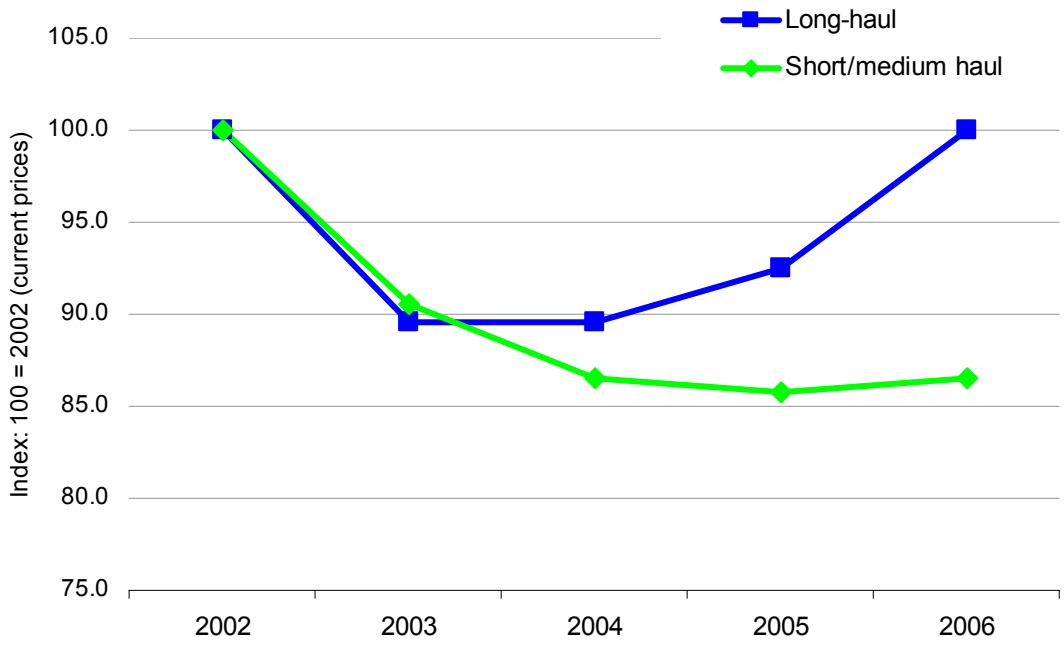
Source: Eurostat

4.2 Financial performance, network airlines

4.2.1 Yields and air fares

The growth of low-cost airlines in Europe and the increase in the use of the internet as a primary method of search and travel booking have put great pressure on airline yields. This has kept short/medium haul yields of European network carriers depressed in spite of continued high oil prices.

Figure 4-12: Passenger yields in current Euros: AEA member airlines (revenue per RPK)

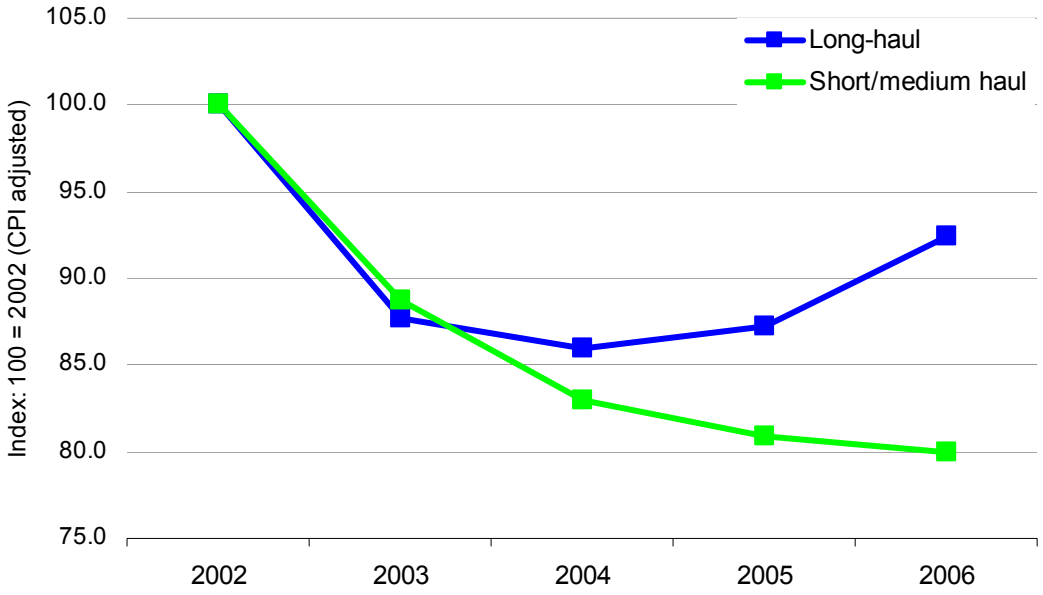


Source: AEA State of the Industry, May 2007

This did not apply to long-haul operations where fuel surcharges have helped lift yields in current price Euros, at least since 2004. This occurred in spite of a slightly weaker US$, which meant that US dollar related revenues would be worth slightly less in Euros.

Figure 4-13 adjusts the yields in current Euros by the euro area consumer price index (CPI, all items). This shows that yields both on short/medium and long-haul services were below 2002 levels, with the shorter haul ones down by 20%.

Figure 4-13: Passenger yields in CPI adjusted Euros: AEA member airlines



Source: AEA State of the Industry, May 2007

Table 4.3 shows how overall yields, both passenger and cargo, have changed in 2006 for the major European network airlines. Fuel surcharges are included in the revenues used to calculate these yields, and this helped British Airways and Lufthansa to register reasonably good increases. SAS's route rationalisation resulted in its average length of haul decreasing significantly, thus helping it to record higher yields. Alitalia and Air France were both faced by greater LCC competition in their home markets which prevented large yield gains.

Table 4.3: Total revenue (USD cents) per RTK - selected European network airlines

	2005	2006	+/-%
Aer Lingus	99.6	103.7	4.1
Air France-KLM	98.8	98.3	-0.6
Alitalia	111.6	99.9	-10.5
Austrian Airlines	99.9	107.5	7.6
British Airways	92.4	99.6	7.8
Czech Airlines	124.5	135.7	9.1
Finnair	120.1	119.0	-0.9
Iberia	112.3	115.4	2.8
Lufthansa Group	94.6	102.8	8.7
SAS Group	141.3	150.1	6.2
Swiss	97.7	95.3	-2.4
Turkish Airlines	91.3	95.1	4.2
Total (12)	104.5	108.2	3.6

Source: ICAO and airline annual reports

4.2.2 Costs

Table 4.4 shows labour trends for the following European network airlines: Aer Lingus, Air France-KLM, Alitalia, Austrian, British Airways, Czech Airlines, Finnair, Iberia, Lufthansa, SAS, Swiss, and Turkish

It can be seen that total employment was down in 2006 (after little change occurring in 2005) compared with the previous year. Some carriers such as Alitalia reduced their headcount sharply in 2006, with small reductions at British Airways. On the other hand, some additions were noted at major carriers Lufthansa and Air France-KLM, with expansion at Turkish Airlines.

Table 4.4: Labour costs and productivity: 12 European network airlines, 2005 vs 2006

	2005	2006	%(pts) change
Total employees (year average x 000)	356,360	349,174	-2.0
Total labour costs (US$ million)	26,390	26,975	2.2
Average cost per employee ($)	74,054	77,254	4.3
Average ATKs per employee (000)	402	422	5.0
Unit labour costs (US cents)	20.7	20.7	0.0

Source: ICAO and airline annual reports

Total labour costs for the sample airlines rose slightly by 2.2% in 2006 to reach US$23.3 billion, with most of this due to small increases in the US dollar/€ exchange rate. Average cost per employee rose to US$77,254, or 2.2%, while the European rate of inflation in the euro zone rose by around 1.9%. Productivity was up by 5.0% in 2006 following a similar gain in 2005.[6] Some of this gain may have been illusory since outsourcing switches the emphasis from managing labour to managing suppliers. However, the resultant stabilisation of unit labour costs was welcomed in another year of rapidly rising fuel costs. It could even be argued that rising fuel costs helped airline management keep other costs in check, the most significant being labour. Figure 4-14 shows labour productivity, expressed as ATKs per employee, for twelve of the largest European airlines. Alitalia reported a large fall in staff numbers in 2006, but this was due to the transfer in 2005 of the following employees to Alitalia Servizi:

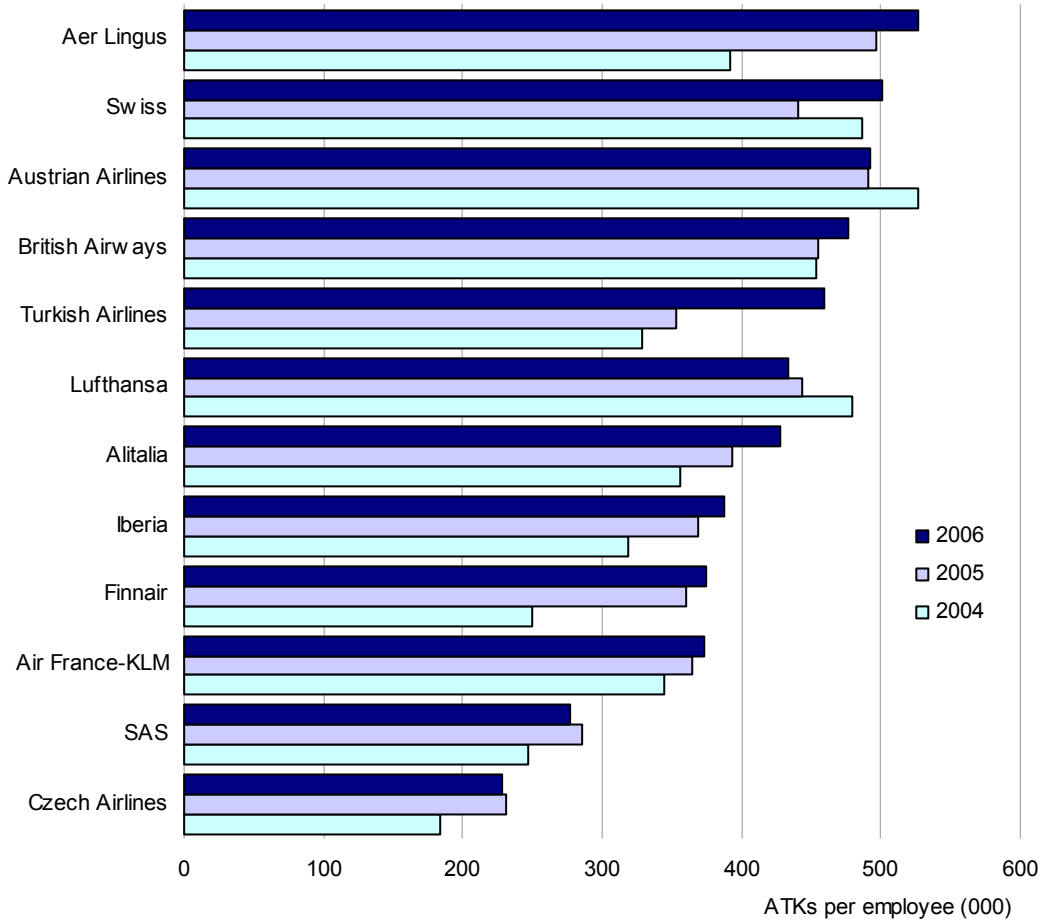
- Airport services
- Maintenance and overhaul
- IT
- Telecommunications (including call centres)

Staff were gradually transferred to the new entity from the beginning of May 2005. Alitalia Servizi was first 100% owned by Alitalia, but by 2006 the Italian Ministry of Finance had gradually taken control, and in 2006 it was no longer consolidated in the financial statements of Alitalia.

For the purposes of the analysis here, the average number of Alitalia Servizi employees in 2006 have been allocated and included with Alitalia's staff numbers based on the percentage of 2006 revenues that were purchased by Alitalia from Servizi (87%).

[6] For Lufthansa and SAS this measure was calculated using employee numbers for their passenger, cargo and MRO divisions only.

Figure 4-14: Labour productivity for selected network carriers, 2004 - 2006



Source: ICAO

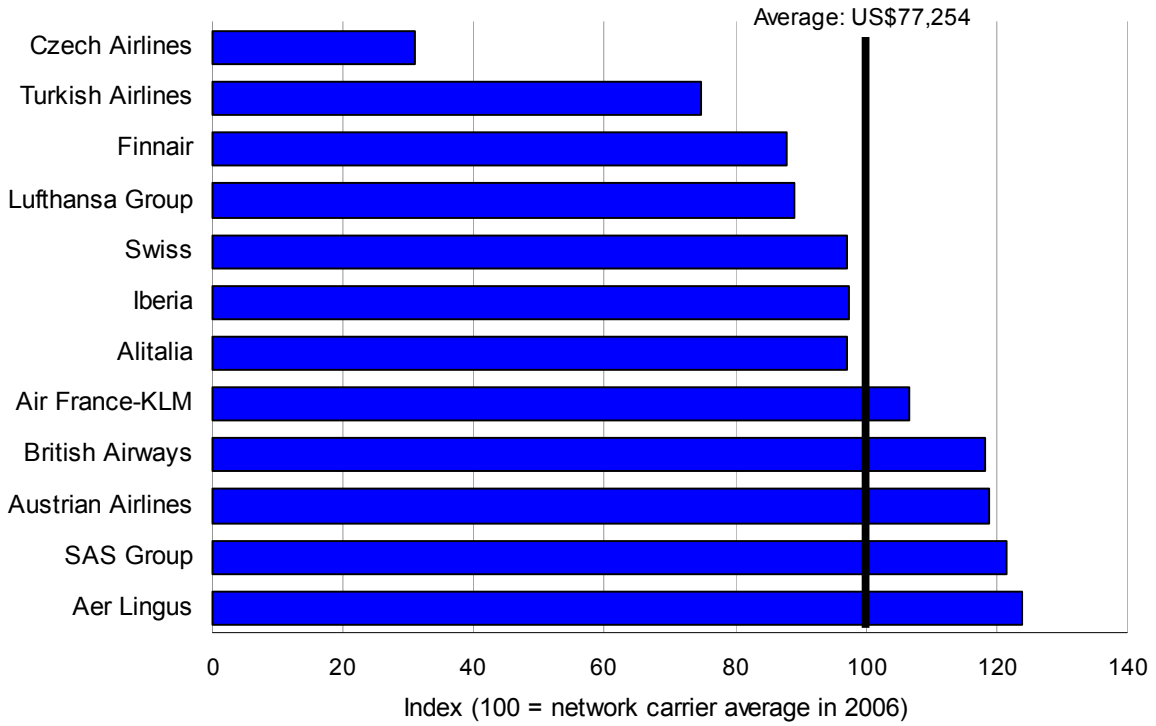
Labour productivity is clearly improved considerably by outsourcing, but it should be noted here that the two airlines that lead the European network carriers on this measure, Aer Lingus and Swiss, have also achieved the greatest improvement in financial results over the past few years.

The other dimension of unit labour costs is the average cost per employee. Lower productivity companies often also pay low wages. This was the case for the Czech airline, but SAS combined relatively low productivity (albeit partly as a result of operating shorter sectors) and high pay. The latter is shown in the next graph, most of the data extracted from both airline annual reports and the ICAO Personnel statistical series.

Scandinavia and Switzerland are high wage countries, and their airlines are no exception to this. Finland is also high cost, but Finnair's average was not so high: this might be explained by the staff working for travel and tour elements of Finnair, which tend to be much lower paid than many of the scheduled airline functions.

Airlines with the largest increases were Aer Lingus, Turkish and Malev. The latter would have been helped by the outsourcing of lower paid handling staff. Icelandair and Czech Airlines experienced some reductions.

Figure 4-15: Cost per employee for selected network carriers, 2006



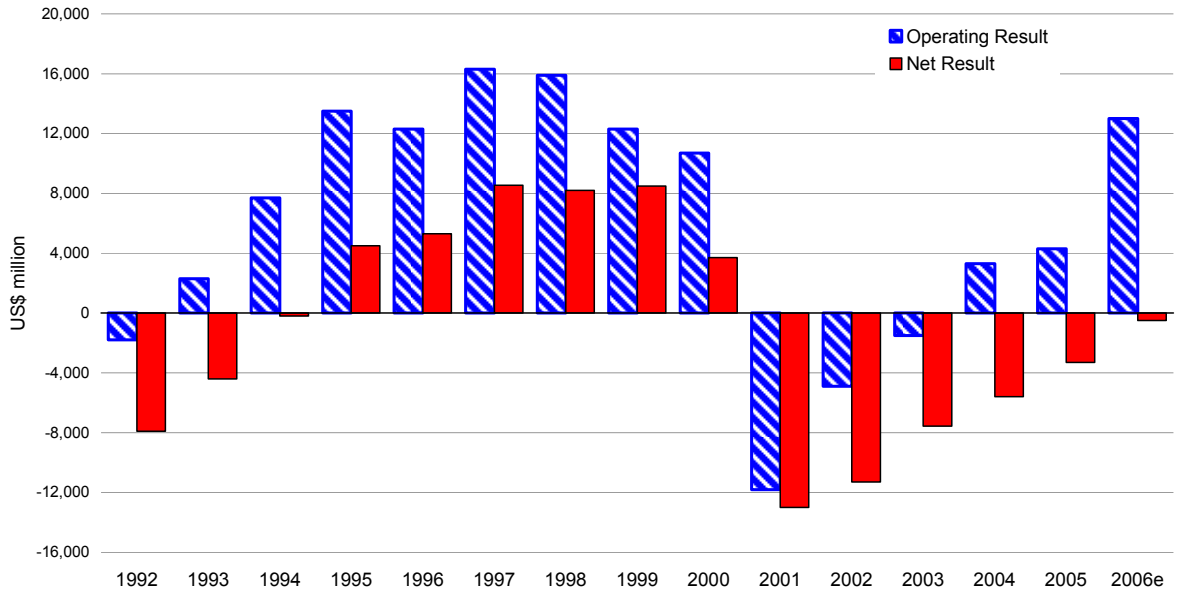
Source: Airline annual reports and ICAO

4.2.3 Network airlines: financial results

The world's airlines continued their recovery in 2006, collectively making US$13 billion in operating profits (Figure 4-16). This level of profitability had only been achieved three times (in 1995, 1997 and 1998) in the last 20 years. However, their net result was just below breakeven, after allowing for financial charges and provisions. The US carriers have a large weight in the world total, and have heavily influenced trends since 1991, but they achieved a positive operating result in 2006 (see below).

The 2006 results were achieved in spite of persistently high fuel prices, with other factors discussed above and in earlier chapters.

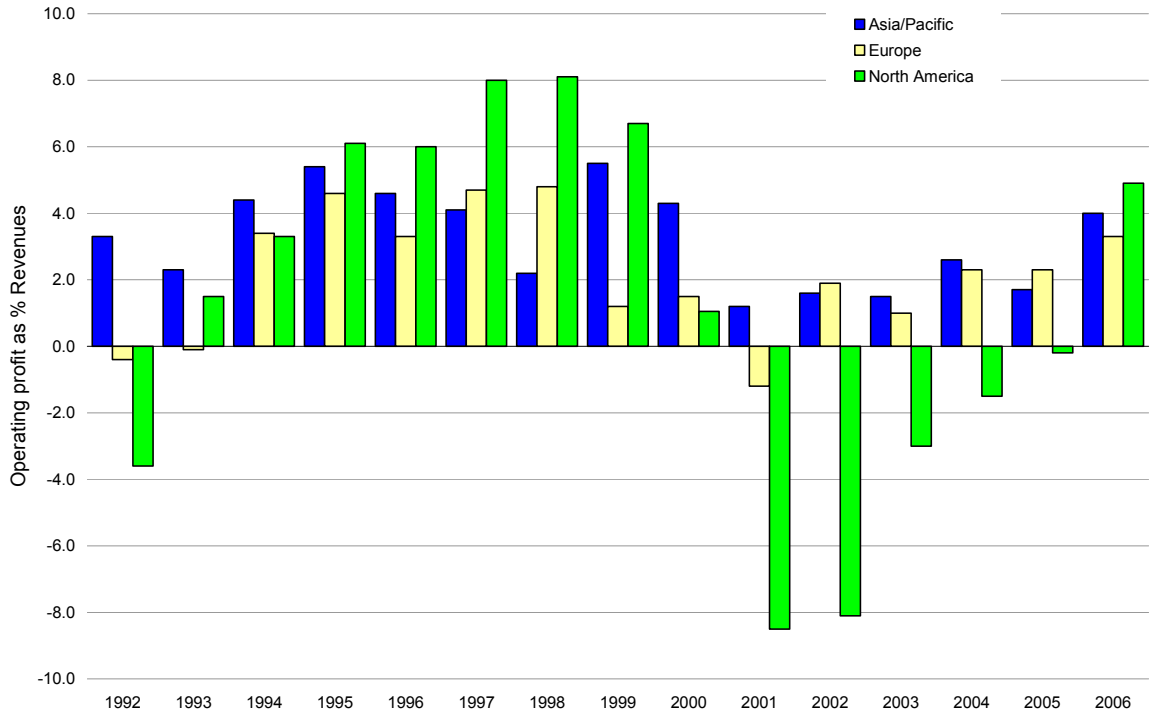
Figure 4-16: Operating and net results of the world's airlines, 1992 to 2006



Source: ICAO and IATA, 2006

The recovery in operating profit looks less substantial when allowance is made for the expansion of revenues since the late 1990s. Operating margins averaged only 2.9% in 2006 compared to levels in excess of 5% in the 1990s (Figure 4-17). IATA forecasts a further improvement in 2007, with the first positive net result since 2000.

Figure 4-17: Operating margins of the world's airlines, 1992 to 2006



Source: ICAO, and Airline Business (August 2007)

The financial results of the major European network airlines are analysed below, followed by an analysis of results from airlines from the other two largest regions of the world: USA and Asia.

Table 4.5 summarises the financial results for the twelve largest European network carriers for which data was available. Notable omissions were TAP, Air Malta and Cyprus Airways, as well as the airlines from the Baltic States. These are the largest AEA airlines in terms of passenger-kms apart from Olympic Airways (no data) and Spanair (part of SAS group).

Table 4.5: Financial results: major European network carriers

	2005*	2006*	%(pts) change
Operating margin (%)	3.2	3.2	0.0
Pre-tax margin (%)	4.6	3.5	-1.1
Total revenue per RTK (US cents)	104.5	108.2	3.6
Operating cost per ATK (US cents)	69.5	72.9	4.9
Overall load factor (%)	68.7	69.5	0.8
Debt/equity ratio (average over year)	1.14	0.90	-0.24
Pre-tax profit as % long-term capital	5.4	5.4	0.0
After tax profit as % equity	16.5	11.2	-5.3
Operating leases as % long-term capital	38.8	38.0	-0.8
Average passenger haul (kms)**	2,265	2,230	-1.6

* Aggregate of airlines reporting different financial year ends: largest part of FY falling in 2006 or 2007

** based on IATA data for calendar year

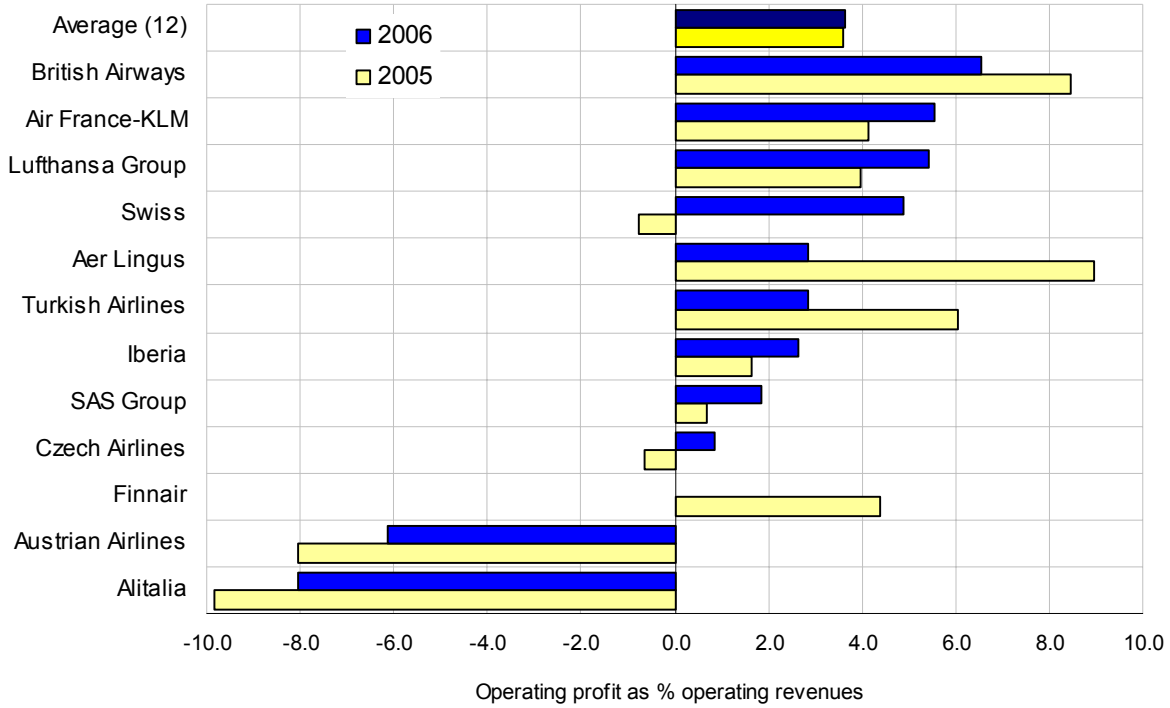
Table 4.5 shows that the European airlines achieved a small operating margin of 3.2% in 2006, unchanged from 2005, in a difficult year of further increases in fuel costs. This however disguises a large variation across the sample. These results would have been worse were it not for an increase in overall load factor to almost 70%. Yields increased by 4% helped by fuel surcharges, but unit costs advanced faster in spite of the contribution of lower unit labour costs discussed above.

The weighted average rate of exchange used to convert local currencies to the US dollar was slightly up on the year. Average spot fuel prices were up by 16% in calendar year 2006. Some airlines end their financial year on 31 March: for example, British Airways which experienced an increase in fuel price of 11% in US dollars for the year ending 31 March 2007, compared to a 38% increase in the previous year.

The twelve airlines made a pre-tax profit of USD4.1billion in 2005, falling slightly to USD3.4billion in 2006. Pre-tax losses were made in 2006 by Aer Lingus, Alitalia, Austrian, Czech Airlines and Finnair. However, Swiss and SAS both moved into profit in 2006, after reporting pre-tax losses in 2005.

Long-term capital has been calculated as the total of shareholders' equity, long-term debt and capitalised finance leases. Around 38% of the total capital was accounted for by operating leased aircraft (estimated by multiplying aircraft lease rentals by seven) in 2006 (little changed from the previous year), showing the importance of their inclusion in financial ratios.

Figure 4-18: Operating margins for major European network airlines, 2005 vs 2006



Debt/equity ratios (including operating leased aircraft) were relatively high in both years, but with a marked improvement over the year. These are normally higher for airlines compared to other industries, due to the widespread use of asset based finance. However, they were still recovering from the severe financial problems following 9/11, with airlines such as British Airways focusing strongly on debt reduction. Alitalia, Iberia, and Swiss managed to reduce their debt/equity ratio by a substantial amount, as did British Airways in spite of a reduction in equity through a large provision for future pension liabilities. Lufthansa and Air France-KLM made smaller reductions in debt/equity, but for most airlines the level was still above 2:1.

4.2.4 Network carriers: key developments

There were a number of important acquisitions and disposals in 2006. TAP signed an agreement in November 2006 to acquire the regional airline, Portugalia, from Banco Espirito Santo for €140m. TAP will take 99.81% of the voting shares of Portugalia and will also acquire the handling company Groundforce for an additional €4m.

Meridiana acquired 29.95% of the share capital of Italian leisure airline, Eurofly, in December 2006. The shares were bought from investment group Spinnaker Luxembourg for €16m, to be adjusted depending on Eurofly's performance in 2006. It also acquired an option to buy a further 14.2% of Eurofly.

Lufthansa sold its 50% share in Thomas Cook AG to KarstadtQuelle just before Christmas 2006. However, as part of the deal, Lufthansa increased its direct stake in the leisure airline, Condor, from 10% to 24.9%. This puzzled one analyst who thought that 'the strategic relevance of (Lufthansa's) continued participation in Condor is not obvious to us, given Lufthansa's own Betterfly low fares and Germanwings' position in the low cost market' (AMB Amro e-mail circular, 8 January 2007). Lufthansa also acquired Thomas Cook's 50% shareholding in Turkish leisure airline, SunExpress.

British Airways announced on 15 November 2006 that it has purchased American Airlines' remaining stake in Iberia which amounts to around one per cent of Iberia's issued share capital for approximately 19 million Euros (or £13 million). This now takes BA's total shareholding from some nine to ten per cent. The transaction is intended to preserve British Airways' two seats on the Iberia board.

British Airways announced that it had reached agreement in principle to sell the regional operation of its subsidiary airline BA Connect to Flybe. BA Connect also operates from London City Airport and between Manchester and New York. These services will not form part of the proposed sale nor will the regional ground handling business, British Airways Regional Ltd.

Privatisation:

The Italian government announced their intention to sell 30.1% of Alitalia, forcing any company or consortium that buys the stake to make a full takeover bid for the loss-making airline with the deadline for initial offers set at 29 January 2007. Important conditions were attached to the sale notably that the buyer must present a detailed industrial plan and guarantee jobs, domestic routes and the airline's 'Italian' identity.

In December 2006 Ryanair decided not to proceed with its bid for Aer Lingus following rejection of their offer by major shareholders and the decision of the European Commission to investigate the competitive implications of the tie-up.

Fuel costs

The continued high levels of fuel costs helped European airlines to focus on reducing other cost items in 2006. However, real progress was made by BA and others on distribution costs both through increased direct sales and e-ticketing (see Chapter 11). Air France continued to cement their relationship with KLM, launching a common frequent flyer programme, Flying Blue in June. The two airlines also harmonised the services that they offered on economy class flights. The also continued to introduce self-service kiosks, with 320 in use at around 50 airports. Their combined number of full-time equivalent staff slightly up on 2005 over the previous year (+0.8%).

Labour

There were both encouraging and disturbing signs on the European airline labour front. Austrian Airlines announced in July 2006 that it was seeking more flexibility in its labour agreements to help counteract the seasonal nature of the aviation business, and provide a 'stronger correlation' between salary and the group's performance. In this regard it had begun exploratory talks with staff representatives and the trade union over new collective agreements. Austrian's previously-announced revamp of its organisational structure, establishing a new streamlined, merged network and sales department, is also designed to support the shift in emphasis.

British Airways announced in July 2006 that it hoped to generate annual savings of £13.2 billion ($24.1 million) after striking a deal covering work practice changes with unions representing its 1,800 London Gatwick-based cabin crew. The new agreements with the T&G and Amicus unions bring together the two previously separate cabin crew operations for short and long-haul.

On the other hand, in late September 2006, cabin crew at Scandinavian Airlines' Swedish division were planning to start industrial action on 5 October should a fresh round of arbitration talks over working conditions fail. The HTF union, which represents around 1,000 of the Swedish division's 1,200 cabin crew, started an initial round of arbitration talks.

Furthermore, a number of Alitalia unions had called a 24 hour walkout for 29 September 2006 as they continued to protest over the company's continued financial difficulties and additional restructuring initiatives aimed at securing its turnaround. These are reported to include the sale of part of its ground services division Alitalia Servizi, a plan hotly opposed by unions. The strike was called off after securing a meeting to discuss their concerns with Italian Government ministers.

Finally, two unions representing Iberia flight attendants had called three days of strike action later in July 2006, adding to the woes the Spanish national carrier is already facing from a planned seven-day strike by its pilots. Both unions were concerned that job losses would result from Iberia's involvement in Catair, which was scheduled to launch operations from Barcelona in October as LCC Click Air . The pilot's strike did take place over three days in July, and was estimated to have cost the airline €15m.

Product

Austrian Airlines rolled out in September 2006 the first part of its plan to shift emphasis from quantitative to qualitative growth with the introduction of its new business class service. The carrier was in the process of reconfiguring nine Boeing 777 and 767 aircraft with its new business class suite, which included 49 lie-flat sleeper seats.

In September 2006, the French government announced its intention to implement its new airline quality label, which it has named 'Horizon', with initial audits planned for November. This is a voluntary certification scheme aimed at helping tour operators and travellers to judge carrier reliability and safety. Overseen by the national committee for security, quality and transparency in leisure travel (CNTT), the plan to create a list of audited operators was spurred by the Egyptian Flash Airlines Boeing 737 crash in 2004 which killed a number of French tourists.

As from November 2006 Air France will be offering a new seat to its business passengers travelling in the long-haul business class (l'Espace Affaires) cabin. The airline has installed a more comfortable new seat in this cabin, which offers much improved features. The first aircraft to be equipped with this new generation of seats is the Boeing 777-200, which came into service at the beginning of November 2006. By May 2007, one quarter of the Air France long-haul fleet will be fitted with these new seats

British Airways also unveiled its next generation business class flat bed in November 2006. The new Club World bed is 25 per cent wider and offers more privacy, greater comfort, with more storage space. The £100 million overhaul of Club World is part of an investment programme in the airline's products and services that includes enhancements to its First Class cabin and the introduction of an on-demand in-flight entertainment system in every cabin across the long-haul fleet.

4.3 Financial performance, low-cost carriers and charter airlines

The financial results of the LCCs have been combined in this section with the charter carriers. This is because of the overlap and difficulty in deciding which category to allocate, for example, Air Berlin (which had just over 40% of its traffic wholesaled to tour operators).

The tables below include the following airlines:

- Air Berlin
- easyJet
- Norwegian

- Ryanair
- SkyEurope
- Transavia
- Vueling

This covers a large part of the LCC sector, but little of the charter industry. The latter do not provide such data in their annual reports, and so far few have reported 2006 to ICAO (via their governments). FlyMe went into liquidation in the early part of 2007 and did not report its last quarterly result for 2006.

The two largest LCCs, Ryanair and easyJet both took the opportunity to raise average fares and yields in 2006. This was eased by the fuel surcharges imposed by network carriers, but also necessary to cover their own increased fuel costs. However, Norwegian and SkyEurope both experience a drop in yield with no compensation changes in load factor or average length of haul.

Table 4.6: Average revenue per RTK: selected LCC and charter airlines

	2005	*2006*	*+/-%*
Air Berlin	73.7	91.7	24.4
easyJet	105.8	113.5	7.2
Norwegian	136.4	130.8	-4.1
Ryanair	73.4	80.1	9.1
SkyEurope	80.0	77.4	-3.2
Transavia	81.3	88.7	9.1
Vueling	93.8	101.1	7.7
Total (7)	85.1	94.2	10.7

Source: ICAO and airline annual reports

Air Berlin's sharp rise in yield must be viewed against a background of a further shift in scheduled rather than charter services. Scheduled services have higher associated costs and so an increase in yield would be expected.

Air Berlin's increase in scheduled services and related costs is supported by the next table, where it can be seen that their unit costs increased almost as much as their yield. Norwegian's unit costs remained the highest of the sample in spite of managing a small reduction in 2006. Norwegian has one of the shortest average passenger length of haul of the sample which explains its high level of yields and unit costs. Both easyJet and Vueling kept unit cost increases down, while Ryanair faced upward pressure from airport charges.

Table 4.7: Average cost per ATK: selected LCC and charter airlines

	2005	*2006*	*+/-%*
Air Berlin	57.3	68.6	19.7
easyJet	83.9	86.6	3.2
Norwegian	101.2	100.3	-0.9
Ryanair	48.9	52.6	7.6
SkyEurope	80.7	79.1	-2.0
Transavia	67.9	73.3	7.9
Vueling	71.8	73.2	2.0
Total (7)	64.8	69.7	7.6

Source: ICAO and airline annual reports

LCCs expanded employment by 15%, with the average pay per employee increasing at well below the EU consumer price index by 0.9%. This reflects these airlines continued strong focus on cost control. Labour productivity, which is higher than the average for EU network carriers, declined by a 5.6% to give an increase in unit labour costs of just under 7%. This was worse than the network carriers (see previous section), and is evidence that this gap narrowed in 2006.

Air Berlin's labour productivity declined sharply, in part due to a growth in single seat sales from 56% in 2005 to 60% in 2006. More significantly Air Berlin incorporated the shorter haul carrier, dba, into its workforce and results for 2006.

Table 4.8: Labour costs and productivity: selected LCC and charter airlines

	2005	2006	%(pts) change
Total employees (year average x 000)	12,718	16,215	27.5
Total labour costs (US$ million)	838	1,078	28.7
Average cost per employee ($)	65,889	66,502	0.9
Average ATKs per employee (000)	826	780	-5.6
Unit labour costs (US cents)	8.0	8.5	6.9

Source: ICAO and airline annual reports

Figure 4-19 and Figure 4-20 show how labour cost and productivity changed over 2005 by individual airline, for both LCCs and charter carriers. Ryanair continued to increase productivity, as did easyJet, helped by further increases in output and the benefit of economies of scale. Norwegian's continued increase in labour productivity was not sufficient to prevent its reverting to a financial loss in 2006, having achieved its first profitable year in 2005.

Figure 4-19: ATK per employee, LCC/charter airlines, 2005 v 2006

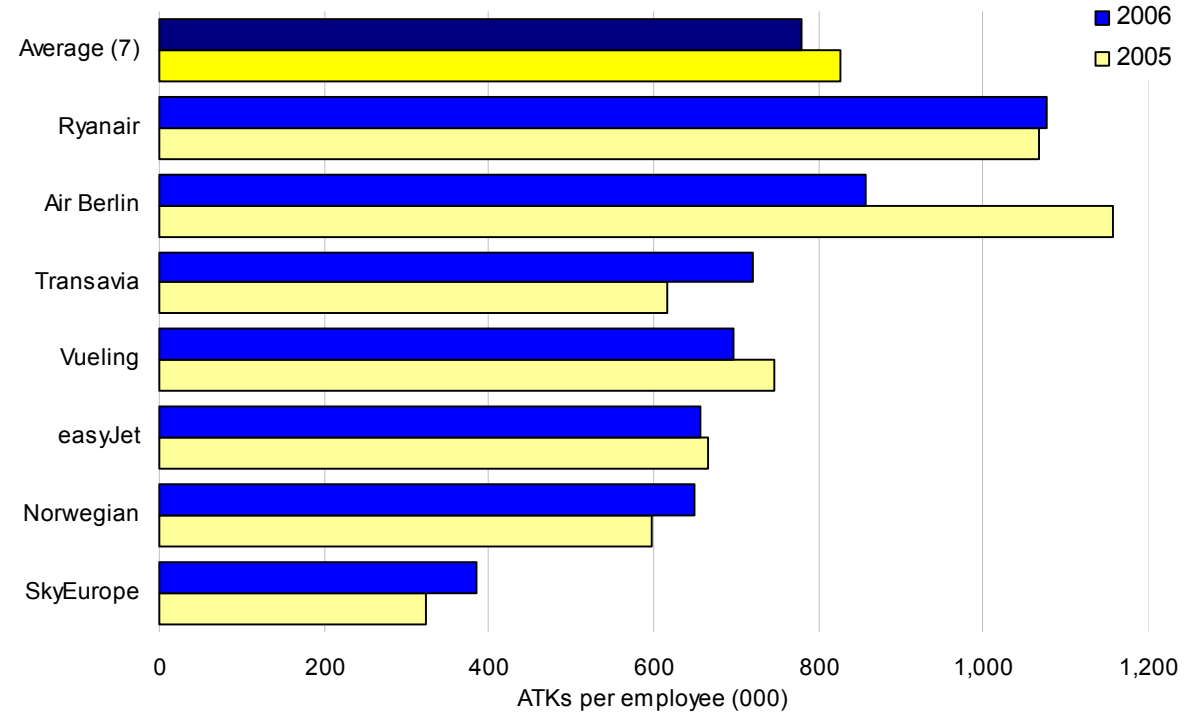
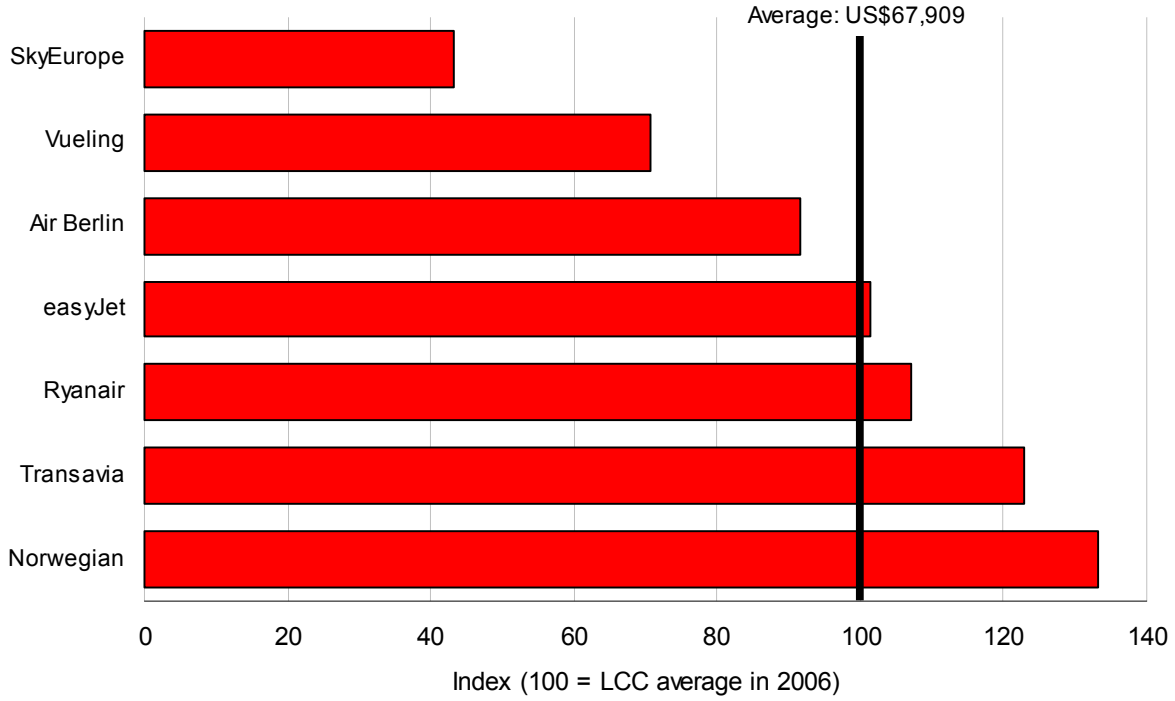


Figure 4-19 shows the large difference in productivity across the LCC/charter airline sample. Transavia and to a lesser extent Air Berlin are helped by flying longer sectors on their charter operations, which in turn are also less labour intensive. For example, sales and distribution costs for charters are almost entirely incurred by the tour operators. The chart does show the clear lead that Ryanair has in this respect, without a stage length advantage.

SkyEurope had low productivity but, as the next chart shows, also pays lower wages and salaries than others in the sample. Ryanair's average labour cost per employee was somewhat higher than that of easyJet in 2006, but the former outsource more jobs that tend to be lower paid.

Figure 4-20: Labour cost per employee, LCC/charter airlines, 2006



4.3.1 Financial result, low-cost carriers

Table 4.9 includes the seven LCC/charter airlines listed at the beginning of Section 2.1. Some of the other important EU LCCs were omitted from the analysis: Germanwings is consolidated with Eurowings, which did publish financial results, but these were heavily influenced by contract revenues for Lufthansa, which consolidated both Germanwings and Eurowings into its financial statements for the first time in 2006. In 2004, the LCC part of Eurowings only accounted for €240 million out of a total of €473m in turnover, increasing to €511m out of the total Eurowings turnover of €759m in 2005 (with no breakdown available in 2006).. Bmibaby is also combined with parent company bmi, with no breakdown given.

Table 4.9: Financial results: European LCC and charter airlines, 2005 and 2006

	2005	2006	%(pts) change
Operating margin (%)	7.3	8.9	1.6
Pre-tax margin (%)	6.0	8.5	2.5
Total revenue per RTK (US cents)	85.1	94.2	10.7
Operating cost per ATK (US cents)	64.8	69.7	5.8
Overall load factor (%)	82.1	81.2	-0.9
Debt/equity ratio	0.72	0.72	0.0
Operating profit as % long-term capital	7.3	9.4	2.1
Pre-tax profit as % equity	10.5	15.5	5.0
Operating leases as % long-term capital	49.2	47.9	-1.3
Average passenger haul (kms)	1,061	1,067	0.6

* Aggregate of airlines reporting different financial year ends: largest part of FY falling in 2005 or 2006

** based on IATA data for calendar year

The operating margin of the LCC/charter group improved in 2006, despite increases in fuel costs, and was well above the average for the network carriers. Unit costs rose by only 5.8%, mainly due to large fuel cost increases, but yield increased by an impressive 10.7% against a background of network carrier fuel surcharges on competitive routes

Average load factors fell by 0.9% points to just over 80%. Ryanair's and easyJet's load factors both dropped slightly, but remained above the average at 83% and 82% respectively. Transavia had the highest load factor (87%) due to its high percentage of charter flights. Air Berlin's charter operations did not make enough of an impact on its overall load factor of 78% in 2006, below the average for the sample.

Figure 4-21: Operating results for LCC/charter airlines, 2005 v 2006

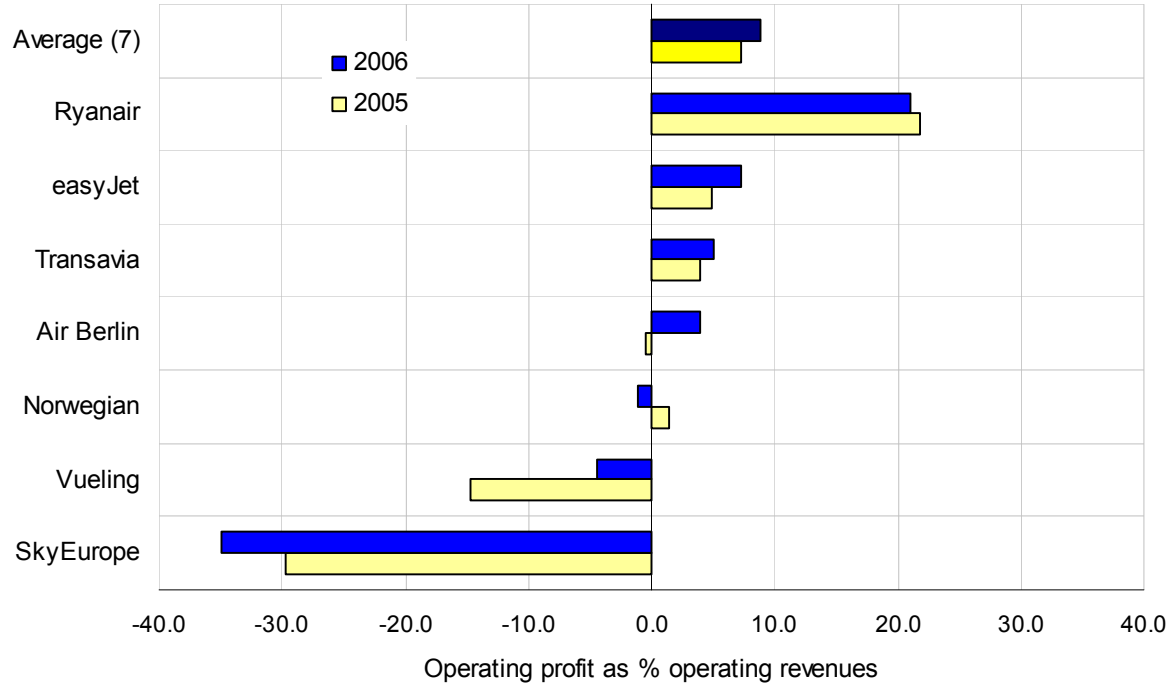
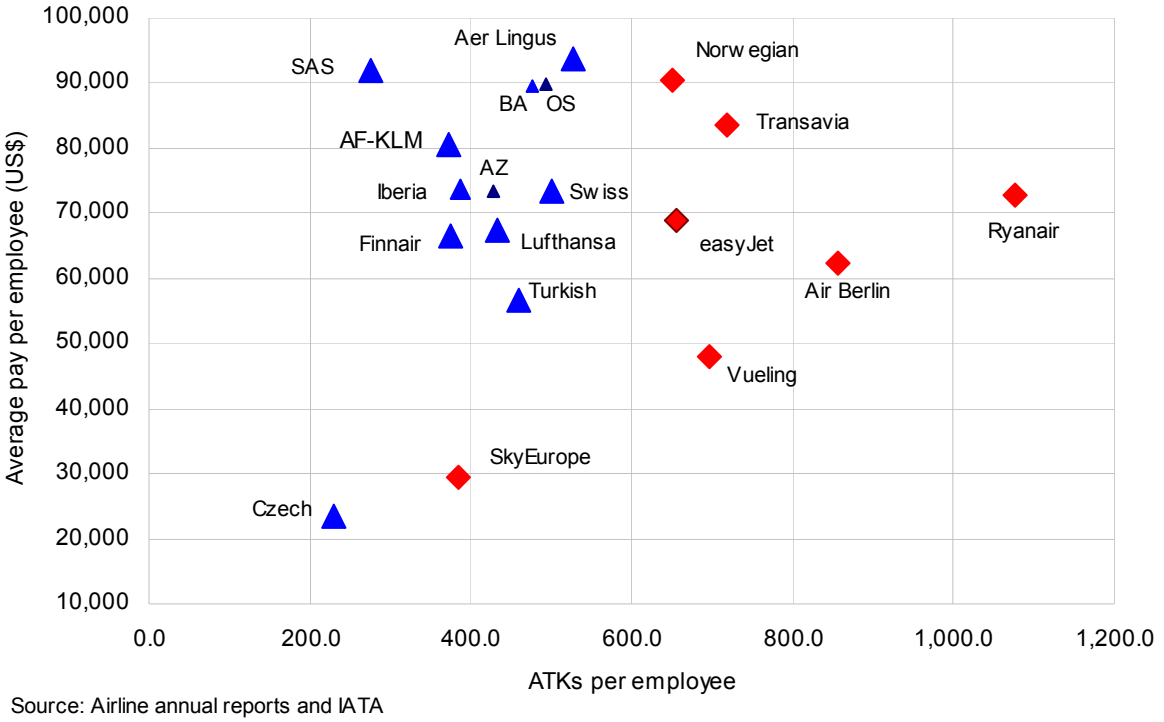


Figure 4-21 shows the operating results for the sample of seven airlines included in Table 4.9. The LCC/charter picture is one of profitability for only four out of the seven airlines, with a marginally better position in 2006. Vueling moved closer to profitability, while SkyEurope's position worsened. Ryanair remained by far the most profitable of these airlines, a position that would also hold if all European LCCs were included.

4.3.2 Financial results: Network vs Low Cost Carriers

Figure 4-22 compares average remuneration and employee productivity for the selected network carriers and LCCs. For the LCCs there is quite a strong correlation between the two, with higher productivity being associated with higher pay. For the network carriers, however, this is not apparent, with similar levels of productivity accompanied by variations in pay. These carriers have outsourced less, and are also faced with higher pension and social costs in some countries.

Figure 4-22: Average pay v labour productivity for network carriers and LCCs in 2006



Source: Airline annual reports and IATA

There are also differences between the average passenger length of haul for the two types of airline. Table 4.10 shows that the network carrier passenger travelled on average a distance of 2,242 km compared to only 1,067 km on the LCC.

Table 4.10: Length of haul (km): LCC and charter airlines, 2005 and 2006

	2005	2006	+/-%
Network carriers:			
Aer Lingus	1,562	1,548	-0.9
Air France-KLM	2,703	2,715	0.4
Alitalia	1,586	1,590	0.3
Austrian Airlines	2,262	2,157	-4.6
British Airways	3,383	3,413	0.9
Czech Airlines	1,496	1,470	-1.8
Finnair	1,965	2,039	3.7
Iberia	1,788	1,904	6.5
Lufthansa Group	2,111	2,065	-2.2
SAS Group	1,460	1,173	-19.7
Swiss	2,105	2,009	-4.5
Turkish Airlines	1,508	1,498	-0.7
Total (12)	2,279	2,242	-1.7
LCCs:			
Air Berlin	1,308	1,241	-5.1
easyJet	927	958	3.3
Norwegian	822	827	0.7
Ryanair	935	982	5.0
SkyEurope	1,152	1,094	-5.1
Transavia	2,086	2,096	0.5
Vueling	842	927	10.1
Total (7)	1,061	1,067	0.6

Among the network airlines, SAS's traffic moved to shorter sectors, while Iberia cut some of their short-haul network, especially from Barcelona. The largest LCCs, Ryanair and easyJet, both expanded more on longer stage lengths.

4.3.3 Financial results: major tour operating groups

Table 4.11 lists the large European tour operators with charter airline subsidiaries in operation in 2006. There were two changes of name of the carriers owned by the TUI Group during the year. Hapagfly has been renamed TUIfly.com and Britannia Nordic has been renamed TUIfly Nordic, reflecting the adoption of common branding by TUI.

Table 4.11: Charter airline subsidiaries of Europe's largest tour operators in 2006

TUI	Thomas Cook	MyTravel	REWE*	First Choice	Iberostar	Kuoni
ArkeFly	Condor	MyTravel	LTU	First Choice	Iberworld	Edelweiss
Corsairfly	Condor Berlin	MyTravel A/S				Novair
Jetairfly	SunExpress					
Thomsonfly	Thomas Cook (Belgium)					
TUIfly.com	Thomas Cook (UK)					
TUIFly Nordic						

* REWE sold its 40% shareholding in 2006.

First Choice

First Choice increased its earnings by 2% in 2006 compared to 2005 giving the organisation an operating margin of 4.3% (Table 4.12). Its turnover rose by 11.2% over the same period. The organisation's strategy of reducing its dependence on short haul mainstream holiday destinations, developing a better quality long haul product, and acquiring specialist niche market tour operators continues to be proving successful. Table 4.13 gives details of the company's share of passengers by length of haul. First Choice Airways operated with a fleet of 31 aircraft in 2006, one more than in 2005.

Table 4.12: Financial performance of First Choice

	Earnings (£m)[7]	Turnover (£m)
2002	75.7	2,183
2003	90.7	2,249
2004	98.6	2,318
2005	115.0	2,442
2006	117.4	2,715

Source: First Choice Annual Reports

Table 4.13: Split of First Choice passengers by length of haul

	Short-haul (%)	Medium-haul (%)	Long-haul (%)	Total (000)
2003	44.6	49.9	5.6	2,906
2004	41.0	52.8	6.2	2,809
2005	36.5	56.4	7.1	2,703
2006	34.4	55.3	10.3	2,542

Source: First Choice Annual Reports.

MyTravel

MyTravel continued to improve its financial performance in 2006, increasing its operating profit by 22.7% to £61.6 millions. The tour operating group's turnover fell by 3.9% compared to 2005 (Table 4.14). MyTravel reduced the fleet operated by its two in-house airlines in summer 2006 by five to 31 compared to a year earlier. Overall, the group's turnover has fallen by 36% since 2002.

Table 4.14: Financial performance of MyTravel

	Earnings (£m)*	Turnover (£m)
2002	(11.9)	4,379
2003	(411.3)	4,190
2004	(47.1)	3,204
2005	50.2	2,910
2006	61.6	2,797

* Profit before tax and exceptional items.
Source: MyTravel Annual Reports

TUI

The TUI group's Tourism division earnings increased by €29 million in 2006 compared to 2005 yielding an operating margin of 2.8% (Table 4.15). Overall, the Tourism division's turnover was virtually unchanged over the same period. While earnings increased by 36% to

[7] Profit (loss) before tax, exceptional items and goodwill.

€89.5 million in the Central Europe division, TUI recorded a loss of €53.7 million in its Western division and a reduction in its Northern Europe division earnings of €21.9 million.

Table 4.15: Financial performance of TUI's tourism division

	Earnings (£m)*	Turnover (£m)
2002	336	12,416
2003	208	12,671
2004	353	13,319
2005	365	14,097
2006	394	14,084

Source: TUI Group Annual Reports.

Thomas Cook

The Thomas Cook Group returned to profit in 2005 after incurring losses over the previous four years. In 2006, the group increased its earnings to €205.8 million, up by over €50 million compared to the previous year (Table 4.16). Turnover rose by just 1.0% during the year to €7780 millions. Its improved financial performance was due to a major restructuring involving a continued reduction in staffing (down from 23,306 in 2005 to 19,775 in 2006).

Table 4.16: Financial performance of Thomas Cook Group

	Earnings (£m) EBITA.	Turnover (£m)
2002	(26.8)	8,059
2003	(151.0)	7,242
2004	(34.5)	7,479
2005	154.4	7,661
2006	205.8	7,780

Source: Thomas Cook Group Annual Reports.

Kuoni

While turnover rose by 10.7% in 2006 compared to 2005, Kuoni's earnings increased by only 1% yielding an operating margin of 3.0%. Kuoni Group employees averaged 7,502 during 2006, up by 8% compared to the preceding year.

Table 4.17: Financial performance of Kuoni Group

	Earnings (CHFm) EBITA.	Turnover (CHFm)
2002	120.7	3,739
2003	102.4	3,295
2004	127.6	3,581
2005	120.4	3,688
2006	121.7	4,082

Source: Kuoni Group Annual Reports.

4.4 Financial performance, regional airlines

Europe's regional airlines are characterised by operating shorter sectors than LCCs and usually operating regional jets or turbo-props. One airline that cuts across this definition is UK based FlyBe: it describes itself as a LCC but operates turbo-props and has recently acquired most of the regional operations of British Airways.

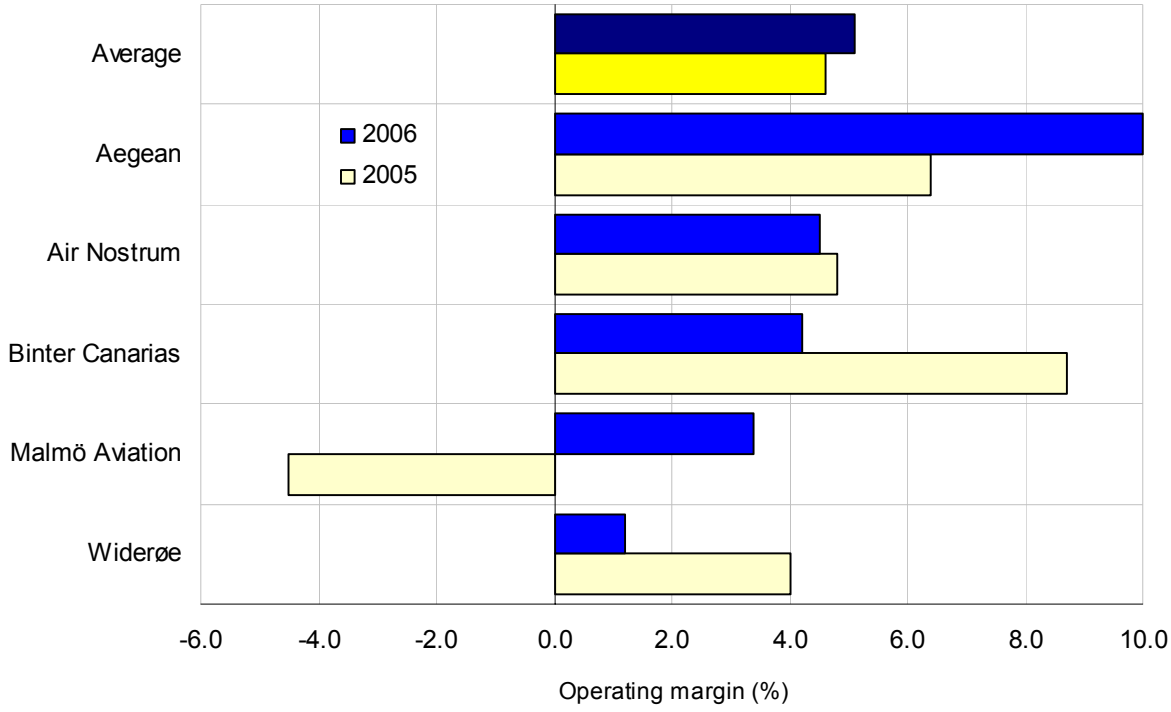
FlyBe had not reported its financial results for 2006 and could not be included in this section. Neither could the regional subsidiaries of major European network carriers such as Brit Air and Régional (Air France-KLM) or CityLine (Lufthansa). Eurowings released some financial data for 2006, but more than half of these operations were accounted for by Germanwings.

However, five airlines have published summary financial results, and these are financially independent from the network airlines, although some of them undertake contract work for them (and also operate PSO routes). Together they generated 7,626m passenger-kms in 2006, compared to Brit Air's 1,570m and Régional's 1,790m and CityLine's 4,035m. CityLine is 100% owned by Lufthansa which reported a €4m loss for CityLine in 2006, and a €4m profit for each of its regionals, Air Dolomiti and Eurowings (the latter including Germanwings).

Figure 4-23 shows the operating margins for the five regionals analysed. Malmö Aviation moved from loss to profit, helped by a large increase in average passenger load factor from 55.7% in 2005 to 70.2% in 2006. This was achieved at the expense of some decline in average yield, down by 5%. However, even with 10% higher unit costs, the airline managed to move to a 3% operating margin.

Figure 4-23 also shows a significant improvement in operating results for Aegean Airlines which improved its margin to 10% in 2006, managing to keep unit cost increases down to 7.7% with a small increase in load factor. Widerøe also saw some deterioration at the operating level with an almost 2% points rise in load factor offset by 12% higher unit costs. Similarly Binter Canarias's margin fell sharply helped by a drop in load factor and a 13% decline in average yields.

Figure 4-23: Operating margin for selected European regional airlines, 2006

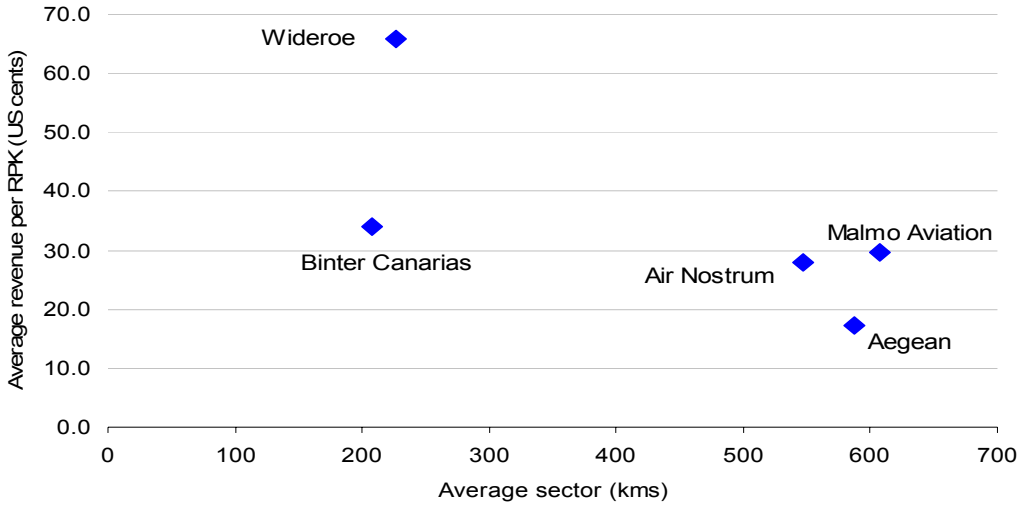


Source: ATI

Figure 4-24 shows average yield in 2006 for each airline together with its average sector length. It can be seen that, as expected, yield declines with sector distance, but Malmö Aviation's yield was higher than might be predicted from this relationship and Binter

Canarias's yield much lower. Costs and input prices may have played a part in these two cases.

Figure 4-24: Yield versus sector length for selected European regional airlines, 2006



Source: ATI

Total net profits for the five airlines in 2005 were US$68.6m increasing by 4% to US$71.4m in 2006. All the airlines were operating profitably at the net level in 2006 in spite of a difficult year on the cost side.

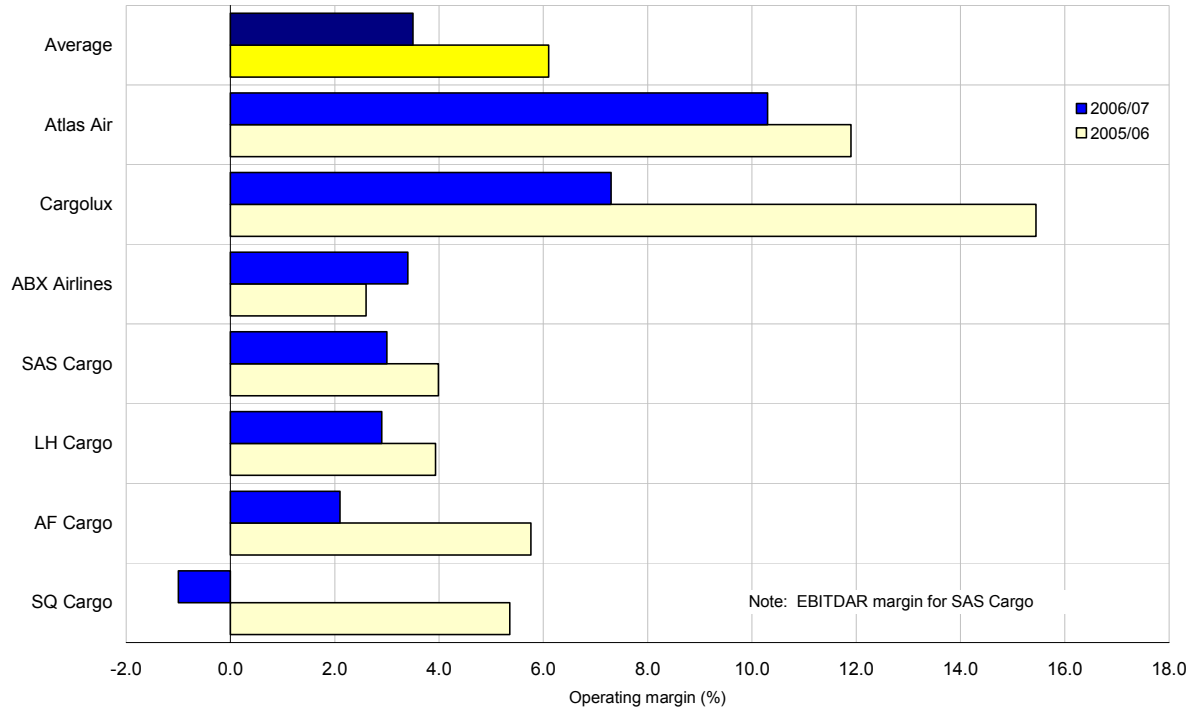
4.5 Financial performance, cargo airlines

Air cargo is carried on both passenger and freighter services. The latter are operated by aircraft with trucks used on many of the shorter sectors in Europe. This section will focus on air services with freighter aircraft, since there is little data available on airport to airport truck services.

Airline Business (November 2007) reported that air cargo revenues earned by the top-50 cargo carriers in 2006 were US$63.7 billion. In this total, revenues for the all-cargo airlines were US$31.1 billion in 2006, of which $22.7 billion was accounted for by one carrier, FedEx. The profitability of cargo carried on passenger flights depends on the method of cost allocation, and IATA no longer publishes these estimates.

However, it is possible to examine the financial results of all-cargo airlines, as well as those combination carriers that have established cargo subsidiaries (e.g. Lufthansa). These are shown in Figure 4-25. The seven companies included (Nippon Cargo did not report operating results) had combined revenues of US$16.2 billion in 2006 and produced operating profits of US$500m. The seven carriers plus Nippon Cargo made a net profit was US$322m, or 2.0% of revenues in 2006 (versus 2.3% for the same airlines in 2005). The only European all-cargo carrier, Cargolux, made an operating profit of US$137m in 2006, with an operating margin of 7.3%, and a net margin of 5.6%. Singapore Airlines Cargo was the only company in the sample to make an operating loss in 2006.

Figure 4-25: Top all-cargo airlines worldwide in 2006 (and % change over 2005)



Source: ATI and airline annual reports and accounts

FedEx and UPS have been excluded from Figure 4-25 because they do not report the profitability of their air cargo operations, only their total operations including door-to-door and logistics products. Together they generated US$25 billion of air cargo revenue, compared with the total revenue of the sample shown in Figure 21 of $14 billion, although a large part of their air cargo turnover is from domestic US operations.

Lufthansa, Singapore Airlines and SAS have all formed air cargo subsidiaries, entirely separate from their air passenger operations. However, in terms of turnover, none of these approaches the size of FedEx. UPS is also significantly smaller, but has a much larger ground transport operation than FedEx. It should be noted that Atlas Air has a somewhat different business model to the mainly scheduled freighter operators: its 2006 revenues were split into 41.4% scheduled freighters (through their Polar Air Cargo subsidiary), 27.6% ACMI (aircraft wet leasing to airlines such as British Airways), 22.1% military charters and 5.6% commercial charters.

In addition to the airlines shown in Figure 4-25, the largest cargo revenues generated in 2006/07 by European passenger carriers were British Airways with $1,168m in revenues, Martinair with $1,000m (the airline also operates passenger charters), and Alitalia with $640m and Iberia with $372. AF-KLM's cargo revenues only accounted for 13% of total group operating revenues in 2006, with 7% for British Airways, 65% for Martinair and 11% for Alitalia.

4.6 Financial performance, other major world airlines

4.6.1 North American airlines

ATA member airlines made an overall net profit in 2006 following five consecutive years of losses totaling US$35 billion. This excludes any bankruptcy related charges provided for in these years. This includes data from 141 US airlines, including Majors (20 including LCCs such as Southwest, JetBlue and AirTran). The operating profit of $7.5 billion was reduced to a profit of $3.0 billion in 2005. Improved cash flow allowed long-term debt to be somewhat reduced to $46 billion, and with the first positive net equity position for some years, a debt/equity ratio of 4:1 was recorded, although before capitalised operating lease obligations.

Table 4.18: Financial results: US airlines (ATA members)

Calendar Year	2005	2006	%(pts) change
Operating margin (%)	0.3	4.6	4.3
Net margin (%)	-3.8	1.9	5.7
Passenger revenue per RPK (US cents)	7.46	7.89	5.8
Operating cost per ASK (US cents)	9.34	9.65	3.3
Passenger load factor (%)	77.6	79.2	1.6
Debt/equity ratio*	negative	4.0	-
Average trip length (kms)	1,697	1,723	1.5

Source: Air Transport Association of America, Economic Report, 2007
* excluding capitalised operating leased aircraft

Passenger traffic rose (by 2.4%) faster in 2006 than capacity which was largely unchanged from 2005 to give a 1.6% point increase in average passenger load factor, with yields well up on the previous year. However, cost control continued to be a problem, given the rise in fuel costs that could not be passed on in surcharges (at least not in domestic markets). ATA's passenger airlines managed to increase fuel efficiency by 6.5% (passenger miles per gallon), but this was overwhelmed by the 18% higher fuel price paid by the airlines. Labour costs per employee advanced by only 1.1% over the year to $73,197 more than offset by an increase in labour productivity 3.6% (ASMs per full-time equivalent (FTE) employee). Total employment fell by around 18,000 jobs to 544,540 FTE airline employees.

Domestic operations accounted for 73.4% of passenger-mile traffic in 2006, but only 45.3% of cargo ton-mile traffic, compared to 74.5% and 48.2% respectively in 2005. Although domestic cargo traffic carried by the integrated carriers such as FedEx and UPS is included, a large part of that is trucked, and thus excluded from the traffic shown here. Transatlantic services were also more important for cargo traffic (19.9% of total traffic) than passenger traffic (12.0% of total). Their passenger load factors were highest on transatlantic and transpacific routes (81% and 83% respectively) compared to 79% on domestic flights and 75% on Latin American routes. Overall, passenger load factors have increased from 67% in 1995 to 79% in 2005.

Passenger yields in 2006 expressed in current US dollars rose by 5.7% in domestic markets compared to 2005. This was slower than the increase in the US consumer price index (+3.2%). International passenger yields advanced by 6.2% in current terms. In real terms, domestic air fares have fallen by 53.1% since the first year of deregulation (1978).

4.6.2 Asia/Pacific airlines

The Asia/Pacific airlines continued their recovery from the SARS affected financial year 2002/03, with a strong increase in both operating and net profits (Table 4.19). Operating

margin for the group as a whole, however, was still only 4%, up by 0.7% points but on significantly higher revenues.

Asia/Pacific airlines with the highest operating profit for the year were Qantas ($1,475m), the Singapore Airlines Group ($844m), ANA Group ($790m), Cathay Pacific ($672m) and Korean Air ($523m). Qantas was the only airline to achieve an operating margin of over 10% (14.5%).

Airlines with the largest operating losses were China Eastern (-$376m), Pakistan International (-$142m), EVA Air (-$103m), Malaysia (-$83m) and Garuda (-$62m).

Table 4.19: Financial results: Asia/Pacific airlines in top 150 world airlines

	2005	2006	+%(pts) vs 2005
Revenues (US$m)	110,155	124,034	12.6
Operating results ($m)	3,678	4,952	34.6
Operating margin (%)	3.3	4.0	0.7
Net result ($m)	1,791	3,313	85.0
Net margin (%)	1.6	2.7	1.1

Source: Airline Business, August 2007

China Eastern Airlines suffered from higher fuel prices but was the only Chinese 'major' to record an operating loss. China Southern managed a small operating profit of $39m in 2006, recovering from its large loss in 2005. Air China was the best performer with an operating profit of $449m in 2006 and operating margin of 5.6%.

The largest low-cost airline in the region was Virgin Blue of Australia, with revenues of $1,039m in 2006 and an operating margin of 9.6%. Air Asia was still relatively small with revenues of only $230m for the year to end June 2006 (and an operating margin of 11%) and did not feature in the top 150 world airline table. Jet Airways of India increased turnover by 20% but its operating margin plunged from 11.9% in 2005 to 0.7% in 2006.

4.6.3 South American airlines

The South and Latin American airlines in the top 150 suffered a decline in revenue in 2006 but improved their operating margin overall by 1.6% points to 6.1% (the highest of any regional group). Net profits were also well up for the group.

TAM (Brazil) and LAN Group (Chile) are the largest of the group, with revenues of $3,381m and $3,034m respectively in 2006. Aeromexico was the next largest with revenues of $1,934m and then low-cost airline Gol ($1,750m). Varig's revenues were down 59% as a result of its retrenchment following entering bankruptcy in 2005. This was also the major reason for the improved results on lower revenues of the group as a whole. Aerolineas Argentinas also recorded reduced revenues, but did not provide financial results. TAM, on the other hand, expanded strongly but also did not report any financial results.

Table 4.20: Financial results: Latin American airlines in top 150 world airlines

	2005	2006	+%(pts) vs 2005
Revenues (US$m)	15,870	14,870	-6.3
Operating results ($m)	707	909	28.6
Operating margin (%)	4.5	6.1	1.6
Net result ($m)	62	859	n/a
Net margin (%)	0.4	5.8	5.4

Source: Airline Business, August 2007

Gol achieved the fourth highest operating margin of the top 150 at 18.4% in 2006, down from 23.3% in 2005. The LAN Group was profitable with an operating margin of 10%, and profits were also reported by Aeromexico and Avianca.

4.6.4 Airlines from other regions

The Middle Eastern airlines in the top 150 expanded rapidly in terms of revenue in 2006 and achieved an operating margin overall of 3.1%. Emirates is by far the largest of the group, with revenues of $8,477m in 2006, the next largest being Saudi Arabian Airlines with revenues of $3,914m. Qatar Airways is the third largest and now ranks 50th in the world with revenues growing by 75% in 2006 to $2,000m. The region's other fast growing airline, Etihad Airways, increased its revenues by 170% to $785m.

Table 4.21: Financial results: Middle East airlines in top 150 world airlines

	2005	2006	+%(pts) vs 2005
Revenues (US$m)	16,952	20,631	21.7
Operating results ($m)	788	630	-20.1
Operating margin (%)	4.6	3.1	-1.5
Net result ($m)	606	89	-85.3
Net margin (%)	3.6	0.4	-3.2

Source: Airline Business, August 2007

It should be noted that the operating margin shown in the above table excludes data from Qatar and Etihad. The Emirates Group, however, maintained its operating ratio at just under 12% in 2006 with a net result of $941m. On the other hand, Saudi Arabian Airlines made a small operating loss of $48m compared to a profit in the previous year, and the next largest reporting airline, El Al, also made an operating loss. Gulf Air's operating loss increased from $211m in 2006 to $321m in 2005, faced with strong competition from Qatar and Etihad. Gulf's operating margin was the worst of the 150 top airlines (-23.5% in 2006).

The African regional group only numbered seven airlines in the top 150 that reported. South African Airways was the largest with revenues of $2,920m followed by Royal Air Maroc ($1,232m) and Egyptair ($1,053m). The others were Kenya Airways, Tunisair, Air Algérie and Comair.

Table 4.22: Financial results: African airlines in top 150 world airlines

	2005	2006	+%(pts) vs 2005
Revenues (US$m)	8,242	8,530	3.5
Operating results ($m)	321	168	-47.7
Operating margin (%)	3.9	2.0	-1.9
Net result ($m)	386	202	-47.7
Net margin (%)	5.0	2.4	-2.6

Source: Airline Business, August 2007

The highest operating margin in 2006 came from Kenya Airways with 13.4% and Royal Air Maroc (6.3%). Egyptair made a very small profit, while South African moved from a small profit in 2005 to a loss in 2006.

Russia extends from Europe to Asia and thus does not fit the categories above, neither do its airlines report to regional airline associations. However, Aeroflot is in the top 50 airlines in terms of international passenger traffic carried. In 2005, Aeroflot's turnover was US$2,983m, up by 17% compared to 2005. Its operating profit was $377m, with a margin on

revenues of 12.6%. None of the other larger Russian airlines report profits, and do not approach Aeroflot in size (e.g. S7 Airlines with revenues of $920m and Transaero having only $504m of total revenue in 2006, both loss making).

4.7 Aviation fuel

Average spot fuel price in 2006 was 194.4 US cents per gallon, an increase of 42.9% compared to the previous year. However, the range for the year was smaller than it had been since 2002. The average price in 2006 equates to US$82 per barrel, which includes a significant margin over the average spot price for crude oil (Table 4.23).

The average fuel cost per gallon paid by airlines depends on market prices, individual contracts and gains or losses from hedging activities. Individual contracts tend to be similar, with some discounts for volume and variations depending on transport costs from the nearest refinery. Airlines that carry out fuel hedging operations can also offset their gains or losses from these contracts against their fuel costs.

The share of fuel costs in total operating costs reported by the world's scheduled airlines by IATA rose from13.6% in 2001 to 25.5% in 2006. The 2006 share varied from 20.5% of total costs for European airlines to 30.4% for airlines based in the Asia/Pacific region, with North American airlines averaging 26.6%. The latter has increased most sharply due to their success in reducing labour costs.

Table 4.23: Average aviation fuel price trends*

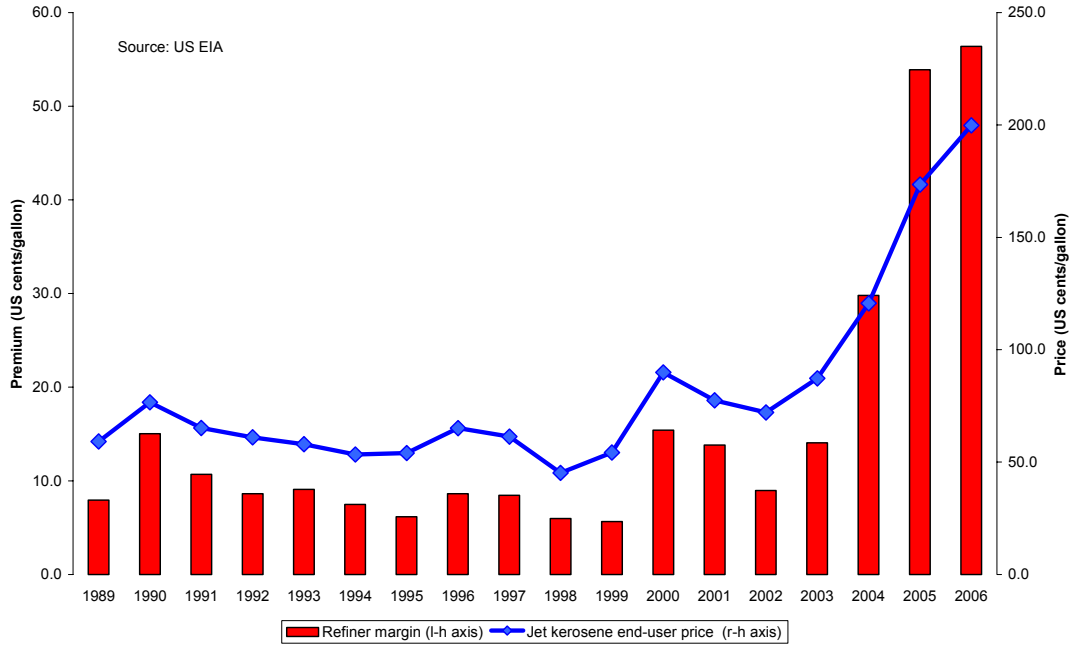
	US cents per US gallon			
	Average	High	Low	Standard deviation
2000	86.1	107.6	72.3	21.7
2001	71.5	81.9	50.3	16.1
2002	68.3	84.6	53.5	15.9
2003	82.7	104.9	69.6	17.8
2004	117.6	156.8	92.1	35.4
2005	168.1	223.2	118.8	43.4
2006	194.4	221.9	170.7	15.6

* Average of principal spot markets (Rotterdam, Mediterranean, Far East Singapore, US-Gulf, and US westcoast)
Source: Lufthansa Cargo website to 2005, and US EIA

Figure 4-26 shows the average aviation fuel price and the margin over crude oil, commonly called the crack spread. This has increased sharply since 2002, with the shortage of jet refining capacity and strong demand for the other middle distillates which are produced in much larger volumes. Some diversion to military supplies was also evident. The average margin for jet kerosene in 2006 was just under 40% above the crude price.

Table 4.24 shows the extent and type of hedging activity for the larger European airlines that provide the information. All the hedges locked in a crude price of between $50 and $60 per barrel, which was somewhat below the actual crude price levels for most of 2006, which were above $60 except for February, October and November. Ryanair had no hedges outstanding at the end of its financial year 2005/06, but at the end of their most recent year (2006/07) they had hedged 73% of their fuel needs for 2008.

Figure 4-26: Average aviation fuel price and margin over crude oil, 1989-2006



Some of the large increases in fuel costs were passed on to the consumer in the form of fuel surcharges. These are differentiated according to length of haul by many airlines.

Table 4.24: FY2006/07 fuel needs hedged at YE2005/06: European airlines

	% hedged	Average price (US$/barrel)	Products	Instruments
British Airways (2005/06)			n/a	Collars & swaps
April to June 2006	66	58		
July to September 2006	58	58		
October to December 06	60	58		
January to March 2007	47	62		
Air France (2005/06)			n/a	Options & swaps
Year 2006/07	83	52		
Lufthansa (2005)				Options & other
Year 2005	86	n/a		
Iberia (2005)				
Year 2005	50	50-60	Jet fuel	Swaps/options
Ryanair (2005/06)	0			

Source: Airline annual reports and websites.

Many LCCs now also levy fuel surcharges, some of them recouping total fuel costs rather than the increases incurred from a baseline. However, neither easyJet nor Ryanair do, although the surcharges imposed by their competitors allow them to adjust their prices accordingly.

The fuel surcharge applied by British Airways at the end of 2005 on long-haul tickets was £35, compared to €52 by Lufthansa and €37 by Air France (interestingly KLM's surcharge was €50). British Airways increased its charge to £35 in April 2006, followed by Air France to €44 ten days later (and again to €51 in August), and Lufthansa to €62 in May 2006. The

only reduction by these airlines in 2006 was by Lufthansa which reduced its surcharge from €62 to €52 in October.[8]

4.8 European airline financing

Table 4.25 shows the principal financial flows for the largest EU airlines in 2006. All the network airlines were able to finance fixed asset capital investment from internal cash flows. British Airways continued to impose strict controls on capital spending, using cash to pay off loans and lower the debt/equity ratio. Both the LCCs had relatively large numbers of aircraft deliveries to finance: easyJet did this from internal funds, sale/leasebacks and new debt. Ryanair more than covered aircraft purchases with cash, but also continued to take out ExIm Bank backed loans. Ryanair also made a major investment in 25.2% of Aer Lingus. In the previous financial year the two major LCCs had covered almost all of their aircraft purchases with cash, although easyJet had made greater use of operating leases.

Air France-KLM has had the largest investment programme of the sample of airlines in the above table, followed by Lufthansa. Air France-KLM covered the cash shortfall with new loans, while Lufthansa's cash generated was more than sufficient to meet capital expenditure. SAS continued to generate cash from sale and leaseback of aircraft, but had very modest purchases of fixed assets which were almost covered by internal cash, and it was able to make a significant reduction in its debt.

Table 4.25: Cash flow summary for major EU airlines, 2006/07

€ million	AF-KLM *to 31/3/07*	BA *to 31/3/07*	Iberia *to 31/12/06*	Lufthansa *to 31/12/06*	SAS *to 31/12/06*	easyJet *to 30/0/06*	Ryanair *to 31/3/07*	TOTAL
Cash flow from operations	2,850	1,429	546	2,105	283	410	870	8,493
Purchase of fixed assets	-2,378	-694	-116	-1,380	-294	-743	-495	-6,099
Acquisitions of subsidiaries/associates	-25	-25	-16	-133	16	0	-345	-527
Disposals of subsidiaries/associates	43	-178	0	58	772	0	0	695
Sale of fixed assets	160	13	0	204	547	356	0	1,281
New equity issued	0	95	22	0	0	33	11	161
New debt/loans	1,240	0	0	743	1,122	266	339	3,711
% new fixed assets from cash flow	120	206	471	153	96	55	176	100
Exchange rate €/local currency	1.00	1.89	1.00	1.00	0.13	1.82	1.00	

Source: Airline annual reports for 2006/07

Export credits also played a role in supporting the financing of new deliveries in 2006, although significantly reduced, at least from the Europeans, from 2005. ECGD, along with its French and German counterparts (Coface and Euler-Hermes), provided support for of 58 deliveries of Airbus aircraft for the financial year to the end of March 2007. This involved ECGD issuing guarantees amounting to some £483 million. The aircraft were delivered to 15 different airlines and operating lessors in Azerbaijan, Chile, Czech Republic, El Salvador, Malaysia, Morocco, Netherlands, Philippines, Qatar, Russian Federation, Turkey, USA and

[8] Collusion in setting fuel surcharges was subsequently investigated by competition authorities in the US and UK.

Vietnam. Only 27% of ECGD guarantees were for Airbus aircraft compared to 44% in 2005/06 when it guaranteed some £1 billion of Airbus financing on 86 deliveries.

In FY 2006, Ex-Im Bank authorized $4.4 billion to support the export of 79 US manufactured, large commercial aircraft and 10 spare engines to a total of 19 airlines and one aircraft leasing company located in 17 different countries. This was roughly unchanged from the $4.3 billion of support that they gave in 2005 to deliveries of 78 aircraft.

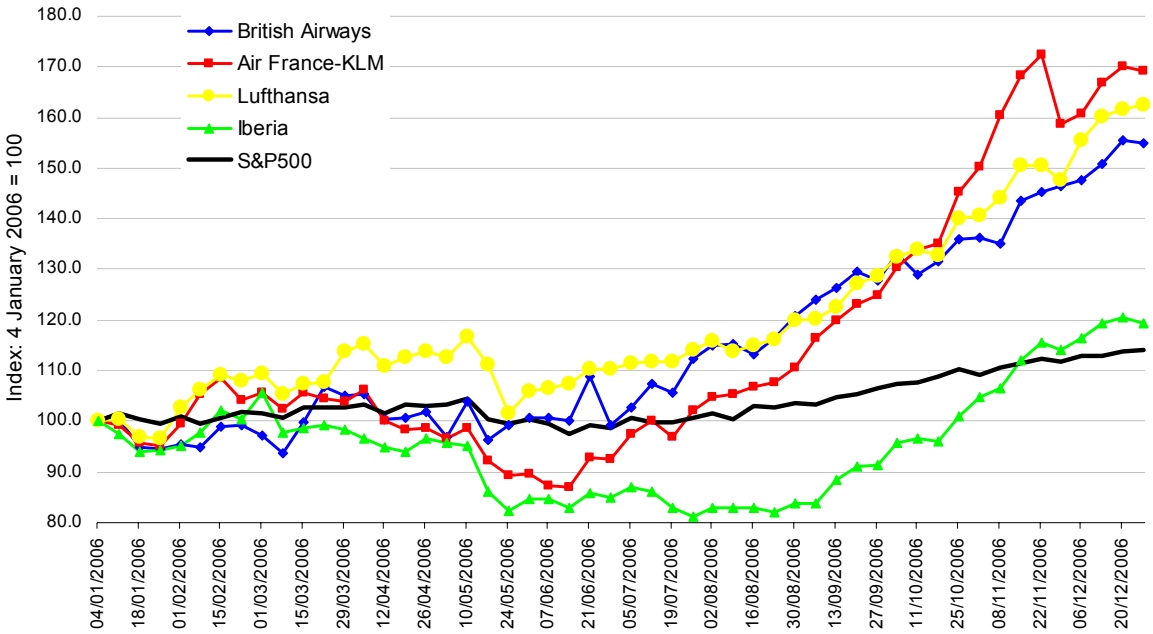
Some airlines raised new equity, with Austrian Airlines shareholders approved an issue of up to 51.68 million new bearer shares at a maximum value of €8.12 per share. The subscription period ran from 16 November until 1 December 2006, and successfully closed with a final offer price of €7.10 per share raising €366.9m. The proceeds will be used to strengthen the capital base of the airline. The announcement followed the decision of Austrian to axe its A330s and five long-haul routes, with associated job losses.

Air France-KLM increased its cash and cash equivalents available on its balance sheet at the end of their financial year, from €2.9 to €3.5 billion. This would cover 66 days of cash operating expenses at 2006 levels (up from 54 days in 2005). British Airways' cash and equivalents declined from £2.44 to £2.36 billion in 2006, covering 119 days of cash expenses (131 in 2005/06). The Lufthansa Group recorded a 30% drop in cash in 2006 from €3.6 to €2.5 billion, but it could still cover 52 days of cash expenses (82 in 2005). British Airways is thus the most conservative in building up cash reserves, but it has also deferred fleet renewal and thus has the greatest need for future acquisitions.

4.9 European airline share prices

The share price for the equities of the major EU airlines broadly tracked the world stock indices in the first half of 2006, but moved ahead of these in the second half, as pressure on fuel costs abated somewhat.

Figure 4-27: Major EU network airline share price index trends in 2006

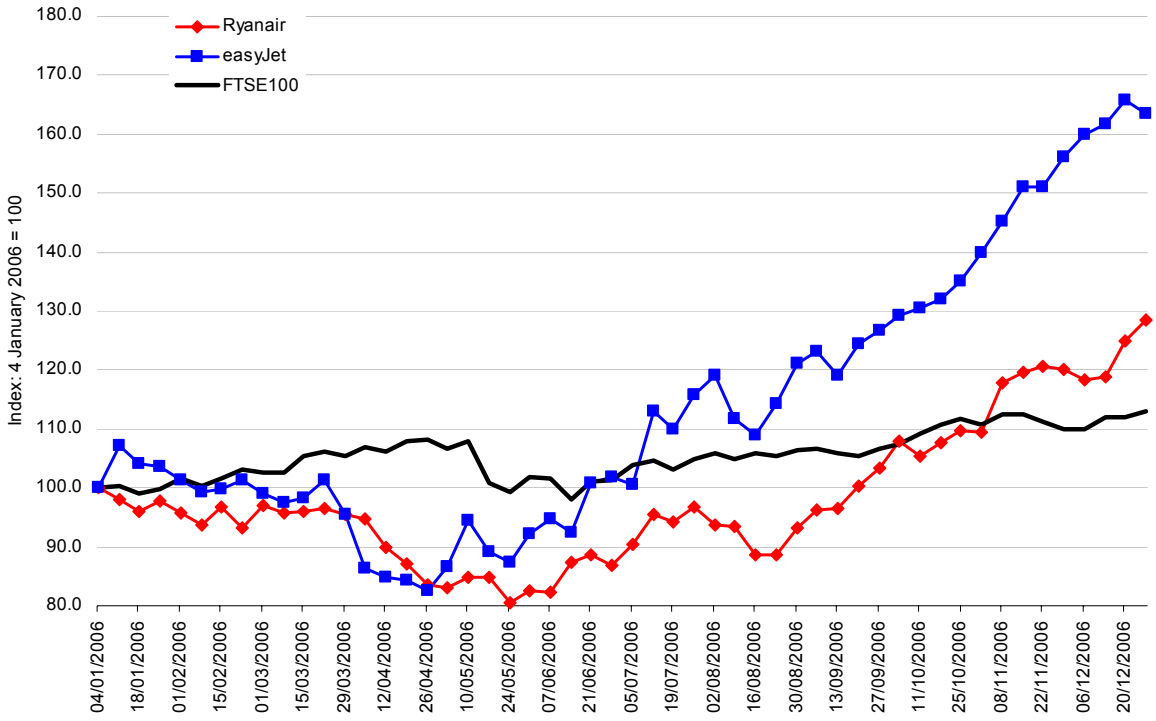


Air France-KLM end the year almost 70% higher than for the beginning of January, with British Airways and Lufthansa not far behind. Iberia, on the other hand, declined during the

middle of the year, picking up at the end of August, but over the year as a whole little above the S&P 500 index.

The two major LCCs are compared with the UK stock index (FTSE 100) in 2006. It can be seen that shares in easyJet strongly outperformed the market over the year, with a similar pattern to the network airlines. Ryanair performed less well up to September, since when it moved ahead strongly.

Figure 4-28: Major EU low-cost carrier share price index trends in 2006



4.10 Airline competition

4.10.1 Alliances

Very few major network carriers remained outside alliance groupings at the start of 2006. The group was reduced in number when one of the largest, Japan Airlines, opted for Oneworld membership. The JAL commitment puts Oneworld in a strong position in the Asia Pacific region, with Qantas and Cathay already members of the alliance. The JAL contribution could be expected to increase total alliance RPK by around one-fifth, and total revenues by close to one-third.

Elsewhere, the focus of interest was on India and China, where Cathay was the only established full member of a world-wide alliance (Oneworld). Star is to welcome Air China and Shanghai Airlines to its fold, while Skyteam acquired China Southern as a future member. As for India, Star has expressed interest in Jet Airways, but with Germany/India code-shares in place between Air India and Lufthansa, alliance groupings are likely to await the outcome of an Air India/Indian Airlines merger before committing themselves. Outside the Asian arena, Oneworld announced Malev and Royal Jordanian will join the alliance in 2007, while Star's footprint in Latin America weakened considerably as Varig struggled to survive.

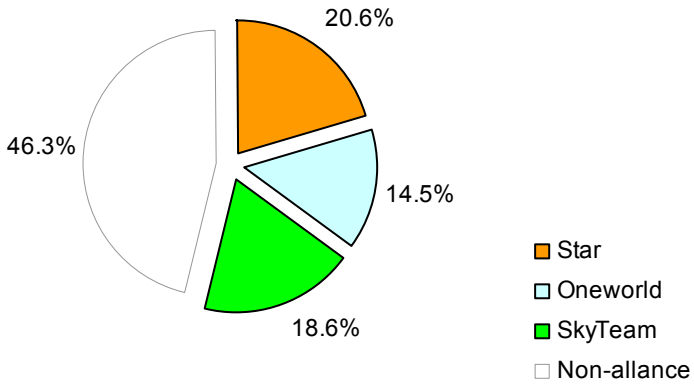
The activity to increase membership, outlined above, means that major carriers likely to remain uncommitted to any alliance grouping will be limited to Emirates, Malaysia, Virgin Atlantic and Saudi Arabian.

Further liberalisation between Europe and the US could shift the focus from alliance membership to consolidation in the form of full cross-border mergers between carriers, on the lines of Air France-KLM.

Competitive position of the major global airline alliance groups

The three global alliances, Star Alliance, Sky Team, and Oneworld, accounted for just under 54% of world capacity (ASK) in summer 2006. Star remained slightly ahead of SkyTeam in terms of capacity share in mid-2006.

Figure 4-29: Share of airline capacity (ASK) by alliance group, summer 2006



Source: Airline Business

However, Star did not dominate in capacity terms in all markets: between Europe and North America SkyTeam led its closest competitor by just over one percentage point, while Oneworld was a full seven points lower. The North Atlantic was the market most dominated by major alliance groups, with 84% of total capacity coming from these three groups. Europe Asia represented the routes with least alliance capacity share (just over one-third).

Table 4.26: Weekly global operations, summer 2006

	Total destinations	Duplicate destinations	Countries serves
Star Alliance			
July 2004	798	317	140
July 2005	770	270	140
August 2006	873	318	147
Change over 2005	**+103**	**+48**	**+7**
OneWorld			
July 2004	591	210	136
July 2005	549	157	133
August 2006	591	163	128
Change over 2005	**+42**	**+6**	**-5**
SkyTeam			
July 2004	512	120	125
July 2005	664	328	146
August 2006	730	366	141
Change over 2005	**66**	**-38**	**-5**

Source: Airline Business

4.10.2 Low cost carrier networks and route strategies

In the 2005 report the networks density of the two main low cost airlines, EasyJet and Ryanair, were examined. It was demonstrated that Ryanair pursues a strategy of low network density in small markets that it can dominate, while EasyJet has a more dense network in larger markets where it faces higher competition. This year it would seem that, as carriers spread their networks eastward in a bid to establish first mover advantage, the two carrier's networks have moved closer to one another in terms of density.

Table 4.27 shows that both carriers have a similar number of routes per airport served. Ryanair has, however, increased dramatically the routes is serves per airport and EasyJet has also increased this measure by a small amount.

Table 4.27: Evolution of service density of easyJet and Ryanair networks

	Routes served per airport		Aircraft per airport served	
	2005	2006	2005	2006
EasyJet	3.28	3.54	1.70	1.65
Ryanair	2.09	3.69	0.84	0.93

source: ATI, EasyJet and Ryanair

However Table 4.27 also shows that the average number of aircraft each airport has we see that Ryanair pushed up this number while the easyJet's ratio fell, suggesting that Ryanair's network is becoming more dense while easyJet's is becoming less so.

Indeed, Table 4.28 offers further evidence of this, showing the average number of weekly frequencies served across the two airlines' networks. EasyJet has dropped its average weekly frequency offered across its network by 15.5% between 2005 and 2006, while Ryanair increased its average frequency by 24%.

Table 4.28: Average weekly frequencies on routes operated by easyJet and Ryanair

	2001	2003	2004	2005	2006
Easyjet	25.1	36.3	32.1	31.6	27.1
Ryanair	17.1	17.3	15.1	14.8	18.4

source: ATI, EasyJet and Ryanair

To compare these two main low cost carriers with their competitors, the network of three other carriers networks were considered: SkyEurope; Norwegian; and Air Berlin. While Air Berlin's network is less than half of Ryanair's in terms of seat capacity, it has a similar number of routes. In fact it offers nearly a hundred more routes than EasyJet. The airline pays for this breadth of routes in terms of frequency and it only offers, on average, just over a daily service.

Table 4.29: Summary of LCC networks and capacity share, Summer 2006

2006	Average Weekly Freq	Tot Seats pw by airline	Capacity share on flights	Capacity share on seats	Routes	HHI	Average no of competitors	Average City size served
EasyJet	27.1	732746	62%	64%	176	6736	2.31	677,522
Ryanair	18.4	986958	78%	81%	284	8038	1.67	451,020
SkyEurope	8.2	61114	78%	79%	53	8216	1.66	438,881
Norwegian	16.4	135864	68%	71%	56	7631	1.77	307,038
Air Berlin	8.5	388513	63%	64%	273	6758	2.14	665,902

Source: OAG and airline websites

It is clear from Table 4.29, that although easyJet has reduced its average weekly frequency, it still has the highest frequencies in the sector. In terms of competitors Air Berlin and EasyJet face a similar situation. Ryanair and newcomer SkyEurope both compete with an average of 1.66 other airlines on their routes, significantly lower than the average faced by Air Berlin or EasyJet. This lower competitive position is further highlighted by their average share of capacity both in terms of flights, but particularly on seats. Norwegian has a similar number of competitors and offers a similar number of weekly frequencies to Ryanair suggesting that the carrier is adopting a similar network strategy to its much larger peer.

Looking at the weighted average population of the cities served, easyJet and Air Berlin tend to serve larger population centres than their peers. This statistic is clearly influenced by the size of the city where a carrier has its principal base and the proportion of flights from that airport. However, both easyJet and Ryanair serve the same home city and Ryanair's average is significantly lower than easyJet's, suggesting the former serves considerably smaller markets. SkyEurope serves similar markets to Ryanair and Norwegian, with its significant domestic Norwegian market, serves the smallest markets.

HHI by City Pair (Summer 2006)

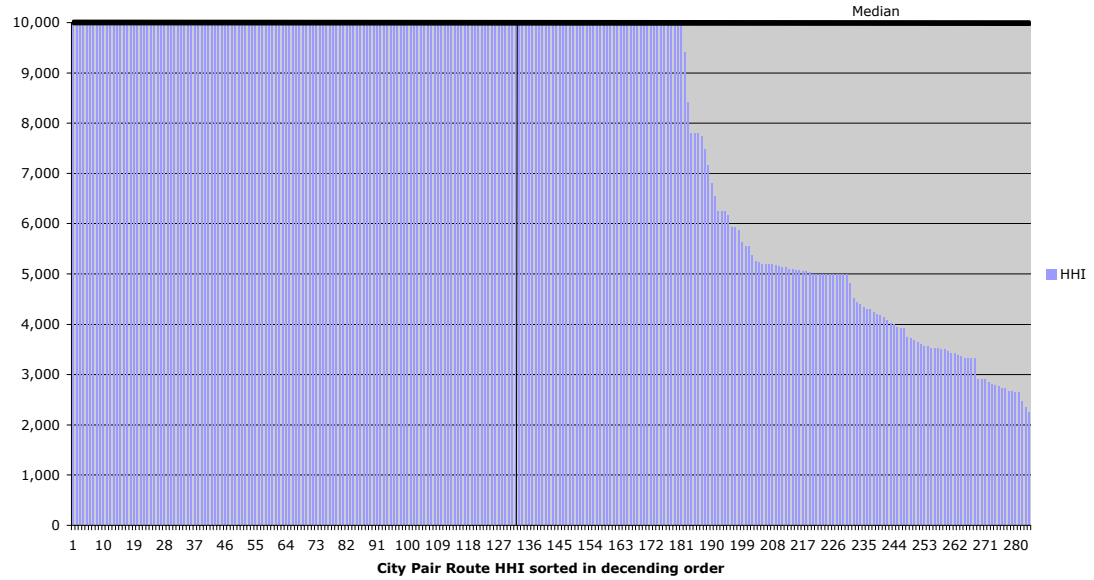
To look beyond the competitive position given by the average number of competitors, the Herfindhal-Hirschman Index (HHI) can be calculated for each of the carriers' routes. The HHI measures the level of competition. It is defined as the sum of the squares of the market shares (in this case based on capacity share) of each carrier in the market. A value of 10,000 indicates the carry has a full monopoly on the route. A score of 5,000 indicates two operators sharing the market equally. Here the route is defined on a city-pair basis.

The average HHIs given in Table 4.29 show that Ryanair and SkyEurope, with their lower density routes serving small populations, have the highest HHI values, indicating lower competition. Norwegian, with its strong domestic market, has an average HHI just slightly

lower than Ryanair and SkyEurope. The lowest average scores were found in easyJet and Air Berlin's networks highlighting their more competitive market conditions.

Arranging an airline's routes by highest HHI to lowest gives a clear picture of the airline's market positioning. For Ryanair we see that more than in two thirds of their routes they are the only airline, although this may understate the competion it faces in terms of city-pair (rather than airport-pair) markets.

Figure 4-30: Ryanair route competitive position, Summer 2006



For easyJet the picture is somewhat different, with the airline being the only operator in just over one-third of its routes, and an HHI of 3,000 or less where it faces very strong competition in 11% of its route (Figure 4-31). While these latter routes are the largest routes it offers and are very dense, making a profit in these markets is more difficult than where it is the only operator. Ryanair, by comparison, has an HHI of 3,000 or less in only 5% of its routes.

Figure 4-31: EasyJet route competitive position, Summer 2006

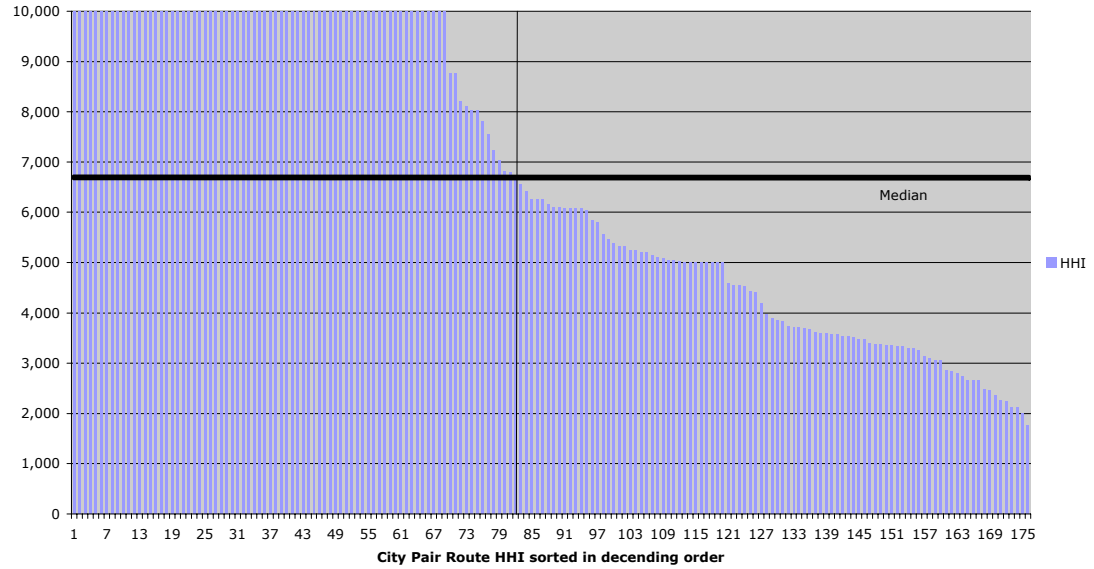
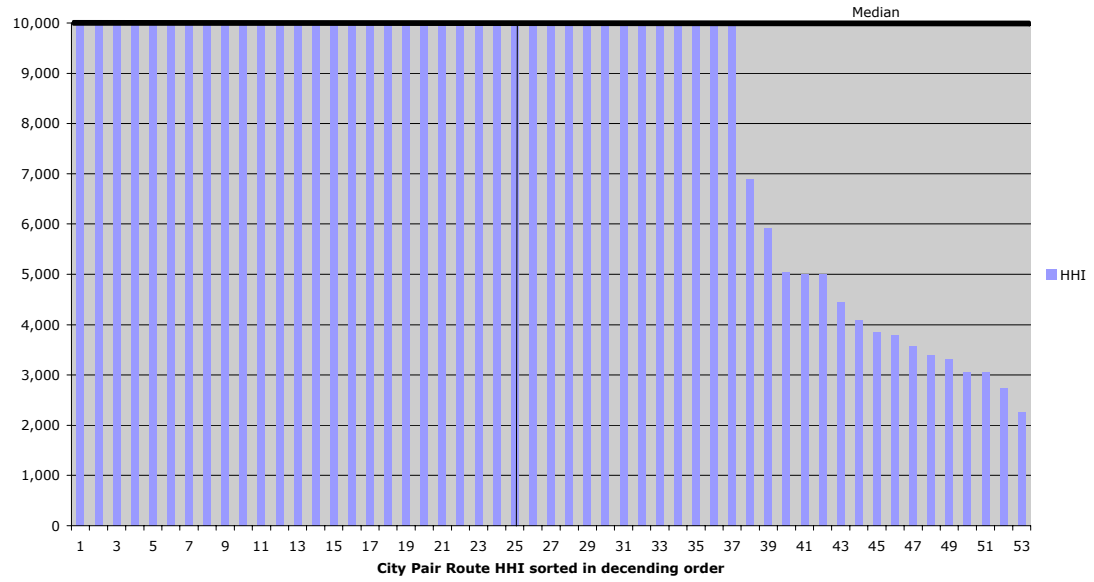


Figure 4-32 shows that the newcomer, SkyEurope, has a considerably smaller number of routes but its profile is similar to Ryanair's, suggesting this carrier is more closely following the network model of the much larger airline.

Figure 4-32: SkyEurope route competitive position, Summer 2006



With a similar number of routes to SkyEurope, Norwegian (Figure 4-33) seems to have sole occupancy on half of its routes while a further 32% of its routes are duopolies. On the rest of its routes its competitive position is reasonable with a shallow gradient of the curve and only one of its routes having a HHI of less than 3,000.

Figure 4-33: Norwegian route competitive position, Summer 2006

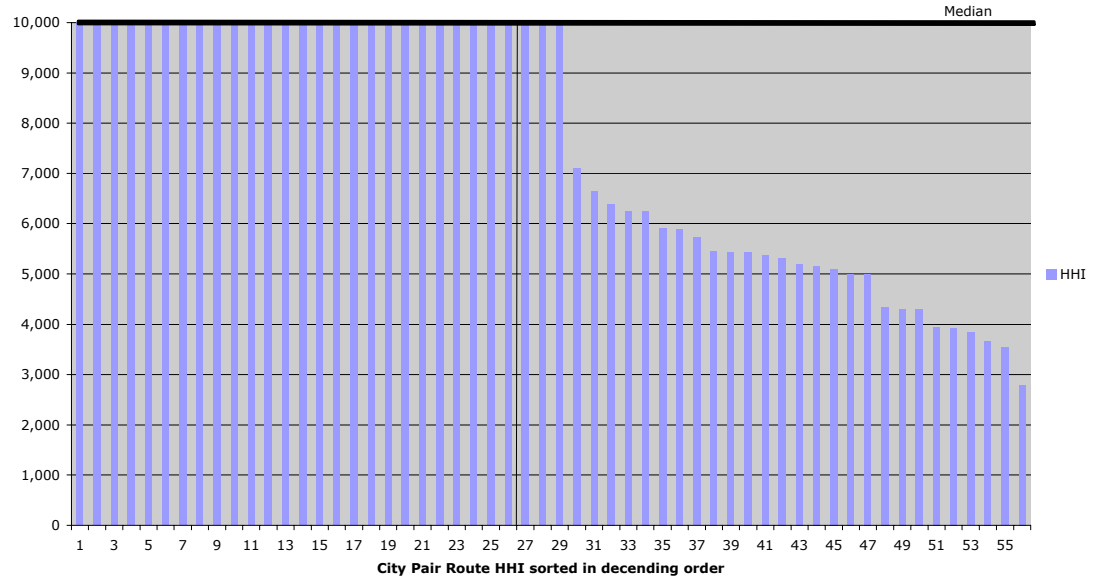
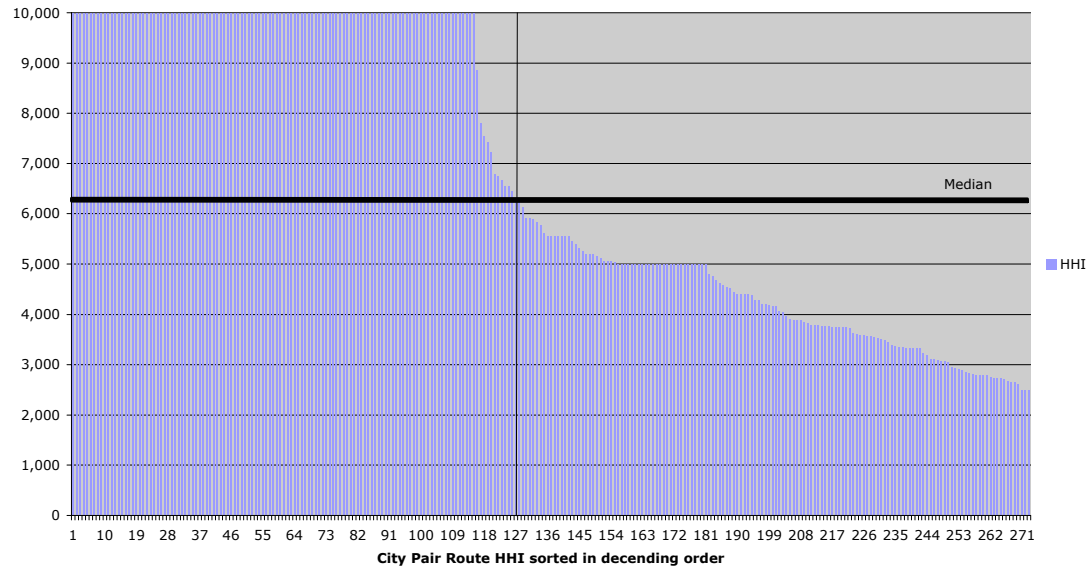


Figure 4-34: Air Berlin route competitive position, Summer 2006



For Air Berlin the profile is rather similar to easyJet's. Like easyJet, the carrier has just over a third of routes in which it is the only operator, with a further third having an HHI above 5,000 (duopoly routes). And like easyJet, thereafter the slope falls away rather quickly towards routes where the airline faces much greater competition.

This analysis of route network structures, densities, and competitive position suggests that the LCC market is still divided into two main approaches, with carriers such as Ryanair, SkyEurope and Norwegian seeking mainly low density, low competition routes while other carriers such as easyJet and Air Berlin seek more dense markets where they face more competition. Having said that, easyJet seem to be slowly evolving their model toward a less dense network.

4.11 Airline distribution

Distribution costs have continued a downward trend for the last ten years, reaching 12.1% of operating costs for the members of AEA member airlines by early 2006. In the US, American Airlines, for example, spends around $285 million a quarter on distribution.

Leaner sales structures, increasing sales via the Internet and the continuous diminution of travel agent commissions have been the primary components in the reduction of distribution costs. Figure 4-35 gives a breakdown of distribution costs from a global perspective.

Figure 4-35: Distribution costs as a percentage of ticket costs

	Cost as a percentage of ticket prices	
	between	and
GDS	8 %	11 %
Payments (Credit card)	2 %	3 %
Travel agent commission	1 %	2 %

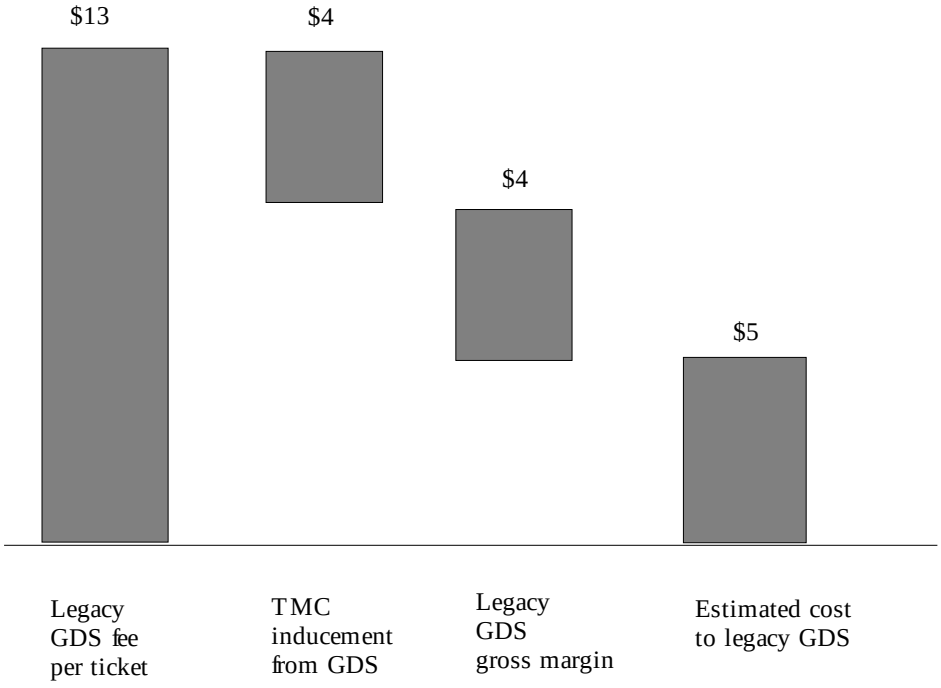
Source: UATP (Universal Air Travel Program), Airline Business, July 2006

The GDSs represent the largest single item of distribution costs, while travel agent commissions and payments represent the smallest proportion of the cost structure. In 2006, four major Global Distribution Systems (GDSs) remain, including (together with market

share): Amadeus (31%); Galileo (30.8%); Sabre (26.4%); and Worldspan (15.1%)[9]. The volume of global transactions through the GDS has risen 4% year-on-year. Along with the usual airline bookings, the GDSs also processed around 250 million reservations for hotels, cruises and other non-air content. Worldwide, the GDSs reaches some 350,000 points of sale and they remain a critical link in selling unused seat capacity.

However, the world's airlines pay the GDSs some $5 billion every year in fees, which represents around 2.5% of their revenues. Members of the Skyteam and Star alliances spent $1.2 and $2 billion respectively on GDS fees in 2006. GDS fees have risen over the years and GDSs enjoyed increased economies of scale as: technology costs plummeted; there was a 7.6% increase in traffic for 2005 followed by a 5.9% increase in traffic for 2006; steady inflation; etc. In the aviation sector, there is much criticism of the high GDS fees, and numerous surveys outline the difficulties encountered by airline managers in reducing this cost. The GDSs charge around $13 per ticket, and Figure 4-36 gives a breakdown of this structural cost. The legacy cost of the GDSs ($5) represents the largest single item as the 30 year old computing infrastructure continues to be patched and upgraded. In addition, the GDSs give a rebate to travel agents and Travel Management Companies (TMCs) of nearly one-third of the GDS fee ($4). Airline commissions to travel agents have largely disappeared, which has forced them to charge a management fee in order to remain in the business. However, the margins earned by GDSs far outweigh those earned by the airline industry. Figure 4-29 shows that legacy GDS gross margin is 31% of the average ticket fee it earns, while the corresponding operating margins for European airlines such as Lufthansa, Iberia and Finnair, were 5.4%, 2.4% and -0.5% respectively for 2006. Low cost carriers generally bypass the GDSs and this has positively impacted their financial bottom line.

Figure 4-36: Breakdown of the GDS cost structure



Source: Star Alliance, Commercial Sales, Airline Distribution Conference, Bangkok, 2005

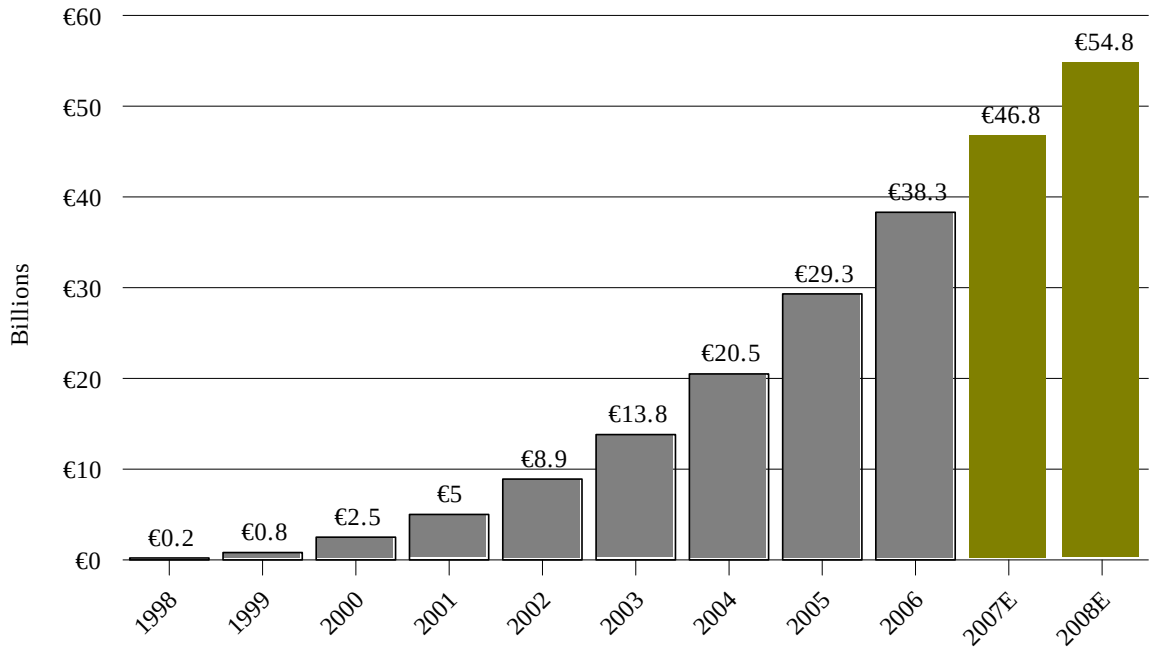
Currently, there are three issues that are changing the dynamics of the GDSs - these include:

[9] In 2007, Galileo and Worldspan merged into Travelport GDS.

- Online booking,
- Global New Entrants (GNEs)
- Regulatory changes.

Firstly, online booking is quickly becoming a prominent distribution channel and booking via an airline's website eliminates the GDS fee. ACNielsen research has pointed out that 627 million people worldwide had shopped online by mid 2005. Airline reservations were the third most purchased item with 135 million passengers shopping online. The report indicated that a large majority of the online payments were made by credit card, while almost half the online shoppers in the UK used debit cards. Furthermore, SITA estimates that around 255 million people travel each year from bookings that were made online with the world's top 20 airlines, and it estimated that this saved almost $900 million in GDS fees. Jupiter Research stated that there was $85 billion worth of online travel sold in the US in 2006 and forecasted that this will rise significantly to $128 billion by 2011. The US has a first mover advantage and its online market is maturing, with 37% of all airline tickets sold online. Figure 4-30 shows the prolific growth of Europe's online travel market, which sold over €38 billion in 2006, rising from zero just eight years earlier. However, Europe's online sales vary considerably from country-to-country, with the UK registering the highest proportion of online bookers with 34% of the European online travel market for 2006, followed by Germany and France with 20% and 14% respectively. Countries such as Greece, Italy, Portugal and Spain still purchase a small proportion of their tickets online, but this is changing quickly as passengers become more familiar with the concept of online booking. The web sales of Europe's network airlines also vary considerably. British Airways, for example, sold around one-third of its worldwide seats online in 2006, but within Europe that figure rises to around 60%, while Iberia only sold 15%. In contrast, Ryanair and easyJet sold around 98% and 95% respectively. Legacy carriers are now following the example of their low-cost rivals by developing their web sales.

Figure 4-37: The value of the European online travel market (€ billions)



Source: Carl Marcussen, Centre for Regional and Tourism Research, 22 May 2007

Secondly, Global New Entrants (GNEs) were expected to change the dynamics of airline distribution but have fallen a long way short of their proposed targets. Systems integration of companies such as ITA Software and G2 Switchworks, were expected to become the new frontiers of distribution as this would have allowed customers to access the airlines' inventories directly without using the GDS as a costly intermediary. The aim was to create a network of direct connections between suppliers, corporate clients and agents, offering complete automation. G2 was backed by nine US airline partners, including Northwest, United and US Airways, which pre-paid large sums to G2. ITA is an independent technology firm that secured $100 million in venture capital backing in January 2006. The GNEs had proposed that the entire GDS fee would become reduced to between 1 and 3 dollars. Airlines hoped that these companies could offer a "low-cost GDS" that would compete with the established GDS providers. Despite the hype and ground breaking potential, the GNEs still represent an insignificant part of airline distribution in the USA and are absent from the European market.

Thirdly, the GDSs became deregulated in the US by mid 2004. Deregulation allows airlines to participate in the GDS of their choice and to negotiate with GDSs to obtain fair value for the content they provide. Deregulation in the US and the entry of GNEs has forced GDSs not only to lower prices, but to improve technology and provide services outside of the scope of the "full content" agreements. This is due to a newfound competitive desire by GDSs to differentiate themselves from airline websites and less complex distribution intermediaries. In the brief history of U.S. deregulation, booking fees have declined for the first time - United, for example, has enjoyed a 20 percent decrease in GDS booking fees relative to the fees it would have expected if regulation had remained in effect.

A revision of the European Code of Conduct for GDS is currently being studied by the European Commission. A proposal is expected soon.

Another area of concern within distribution is credit card fees. Visa, for example, handles $3 trillion in purchases worldwide each year and has 1.6 billion cardholders - it is a powerful entity whose charges are not likely to be influenced solely by airlines. Credit card issuers typically charge online retailers 2.5% to 3% per transaction. Research by Airline Business in 2006 showed that airlines paid credit card companies vast sums of money - carriers in Germany, UK and Spain paid out $6.1, $3.2 and $2.5 billion respectively. Credit card fees, however, vary widely between European countries as the Czech Republic, Hungary and Portugal pay four times the fee than retailers in countries such as Sweden, Italy or Finland.

Ryanair stopped using the American Express because of its excessive charges, while British Airways refused to absorb credit card merchant fees on UK corporate net fares. Airlines are beginning to embrace payment plans that bypass the credit card schemes altogether. British Airways, British Midland and easyJet have no charge for debit card usage, while Ryanair and Flybe charge €0.60 per passenger per flight. In the US there are a variety of companies that offer alternative forms of payment, including PayPal, BillMeLater and CheckFree. This system is largely associated with value-conscious, low-yield leisure travellers and has the potential to spread to Europe. Around the world, airlines are looking for ways to reduce this cost: in Belgium internet-based pay from home is offered by ING bank; in Malaysia Maybank clients can buy direct from AirAsia; India's Air Deccan has hooked up with petrol retail outlets; Gol introduced a private label card for its home market in Brazil; and British Airways has partnered with AirPlus to use UATP accounts.

Airline commission to travel agents now represents the smallest component of distribution as commission has largely been reduced to zero percent within Europe. Travel agents are facing increasing competition from online retailers and direct sales, and all this has taken a toll on

the number of travel agents who have decided to leave the business. In the German market, for example, there were 15,000 full-time travel agents in 1998, but this had declined to 11,866 by 2006, with 773 agents going out of business in 2006 alone. However, some airlines are still paying domestic commission[8], including: Iberia paying 0.4%; Aer Lingus, Alitalia, Austrian Airlines, TAP and Tarom all paying 1%; Cyprus Airways and Croatia Airlines generously paying 7%; and Olympic paying between 6.9 and 8.5%. This commission is also expected to be eliminated in the near future.

IATA's enforcement that all tickets need to be electronically compliant by 2007 has shown remarkable progress as paper tickets will shortly become a collectors' item. E-ticketing has grown from just 16% in 2004 to around 74% by 2006. IATA figures released in December 2006 showed e-ticketing penetration at just 13% for the Middle East region, which is trailing well behind all regions except the CIS. That contrasts strongly with the US, which was close to 100% e-ticketing, while North Asia has made strong progress since early 2005, increasing e-ticketing penetration from around 20% to approximately 90% in 12 months**.** Europe has also shown a steady increase, registering 74% penetration by the end of 2006.

Airlines which are not 100% e-ticketing compliant by the end of 2007 will not only lose access to global distribution channels, but will not be able to continue their codesharing and interline agreements with compliant carriers. Conversely, e-ticketing delivers significant savings for airlines through faster and more efficient passenger processing and lower overheads. IATA extended the deadline to May 2008, which was aimed primarily at giving states with low penetration rates the time to update their computing systems and unblock the remaining legal restrictions. IATA's 2006 Corporate Air Travel Survey found that 88% of passengers prefer electronic tickets to paper tickets. The reasons included:

- 'I do not need to bring my airline ticket(s) when I check-in' (71%)
- 'I immediately receive my e-ticket confirmation by e-mail' (64%)
- 'I can access my e-ticket anywhere and at anytime' (49%)
- 'I receive a receipt of my booking by e-mail' (34%)

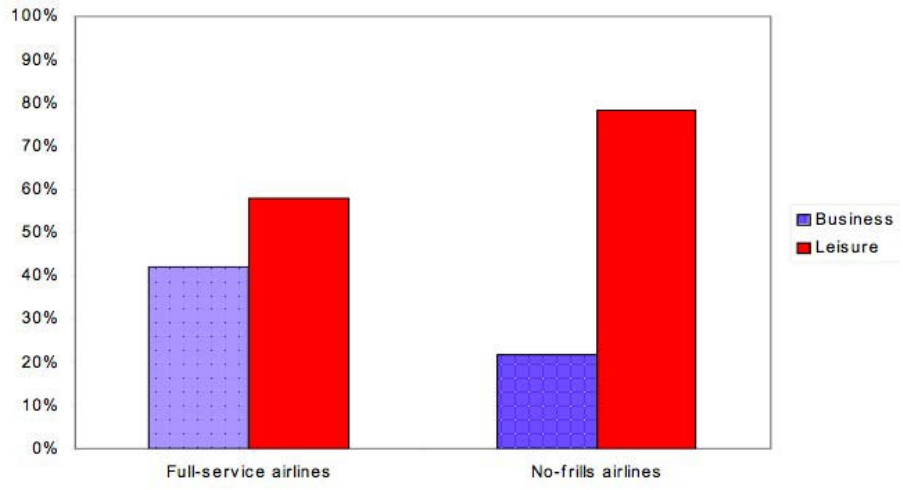
4.12 Consumer issues

4.12.1 Consumer demand EU 2006

Last year's report highlighted the shift in passenger demand from business to leisure as the growth in leisure travel outstripped the growth in business travel. The two groups of travellers are using both network and low cost carriers for air transport. A study by the UK CAA shows that 60% of full service airlines and about 80% of low cost carrier passengers are travelling for leisure purposes meaning that business travel accounts for 40% of full service airline passengers and 20% of low cost airline passengers (Figure 4-38).

Surveys from the BAA airports provide similar but more detailed evidence for network and low cost carriers and also show the purpose of trip for charter carriers. The lion's share of charter carriers' business is derived from inclusive (package) tour traffic. Neither network carriers or LCCs carry much of this traffic, but the low cost airlines carry a substantial element of visiting friends and relatives (VFR) traffic. The study suggests that about 40% of all low cost carrier traffic is VFR.

Figure 4-38 Passengers (UK-EU and domestic) on scheduled services by journey purpose

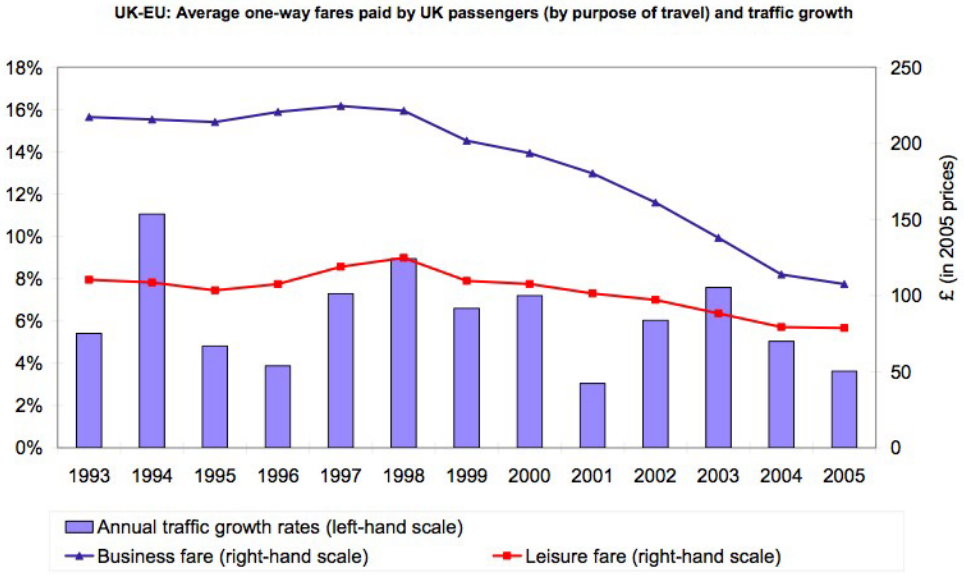


Source: CAA, 2006

Fares

Referring to a CAA report, the cyclical nature of airline passenger growth is evident. For UK-EU passengers, growth fluctuates from about 3% in 2001, to 11% in 1994. 2003 saw the highest growth since the millennium but the graph suggests the market is heading towards the bottom of a trough. What is perhaps more interesting is the average fares paid by both leisure passengers and business passengers has been falling steadily in real terms since 1998, following the full liberalisation of the EU air transport market in 1997. Business passenger fares for intra-European flights have almost halved while for leisure travel the fall has been about one third. Given the growth of low cost carriers in this time frame it is interesting that the more significant fall in real fares has been for the business passenger.

Figure 4-39: UK-EU Passenger growth and air fares, 1993 - 2005



Source: CAA, 2006

The CAA's report on the impact that low cost carriers[10] have had on the UK market is instructive from a European wide perspective as the market seems to be developing in other countries like it has done in the UK. The main finding is that the low cost sector has principally taken market share from network carriers but the overall growth in the market cannot be attributed to traffic generation, rather natural market growth.

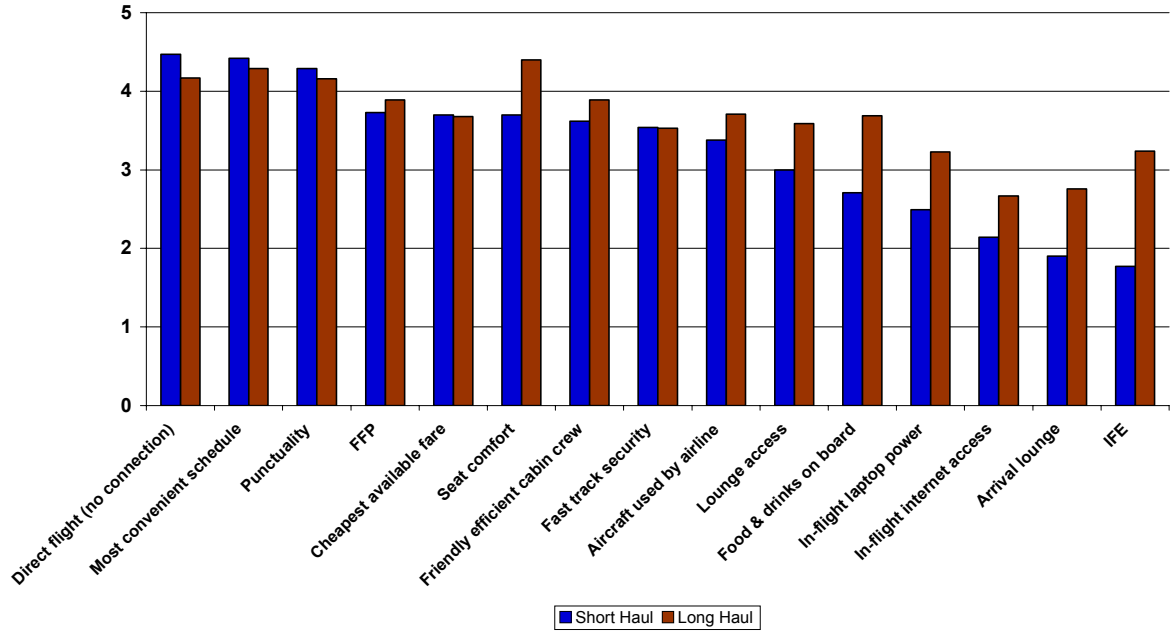
4.12.2 Business travel

A survey of nearly 300 European business travellers[11] showed the key purchase factors for business travellers remains convenient schedule, punctuality, followed by fare and frequent flier programme rewards.

For long haul flying, not surprisingly, seat comfort is the most important purchase consideration.

Regarding class of travel, most European business travellers regularly use economy or discount economy seats for intra-European travel, while over 40% of travellers are allowed by their company to fly in business class for long haul travel.

Figure 4-40: Airline choice factors (0-5 increasing importance)

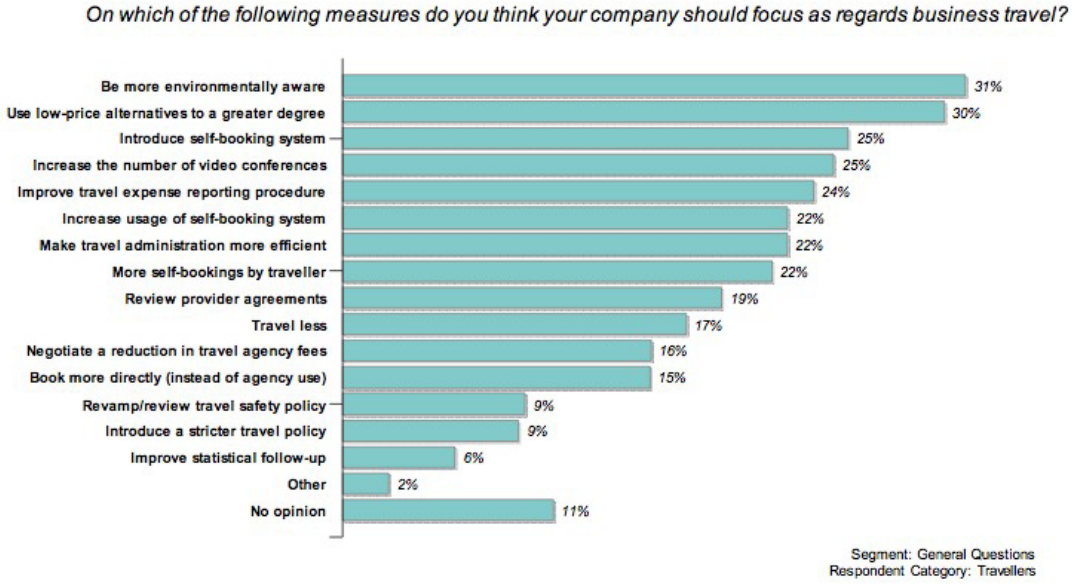


Source: BTRC, 2006

The following survey of Scandinavian business passengers highlights some of the key issues in the sector in 2006

[10] CAA, (2006), "No-frills carriers: Revolution or Evolution?", November.
[11] BTRC, (2006), "Annual Survey of Business Travellers 2006", Business Travel Research Centre, Cranfield University

Figure 4-41: Issues facing travel choice



Source: FlyNordic, 2007

The most important of these were:

- Business travel's environmental impact
- Use of low cost carriers
- Online booking
- GDS deregulation
- Delays, cancellations and other travel irritations.

4.12.3 Business travel's environmental impact

2006 can be seen as the year in which the business travel community began to take seriously its impact on the environment. Environmental concerns were the highest of any business travel concern in the survey above. BA, Virgin Atlantic were among carriers introducing schemes for passenger to offset the carbon created during their flights for a charge. The Association of Corprorate Travel Executives (ACTE), the UK's Institute of Travel Management (ITM) and its German counterpart, the VDR, all had environmental issues at the heart of their annual conferences.

The ITM has introduced Project Icarus[12] to promote carbon reduction in travel management programmes though the business travel industry. As part of the project companies that purchase business travel can apply for Icarus accreditation. This requires companies to measuring the carbon created by their travellers' flights and committing to reducing this amount to meet the a UK government target of a 60% reduction in CO_2 emissions by 2050.

One way in which travellers might reduce their travel is by reducing the number of "escapable" business trip such as internal company meetings and follow-up meetings with clients. A BTRC survey of European business travellers indicates that alternative forms of

[12] www.itm.org.uk/icarus

communication such as web and video conferencing have been used by over 40% of travellers in the past twelve months.

4.12.4 Use of low cost carriers

While the survey of Scandinavian business travellers seem to suggest this traveller group would be pleased to make great use of low cost airlines, another survey suggest that travellers are not too enamoured by these carriers. A study by Carlson Wagonlit[13] found that only 10% of European business travellers regularly use low cost carriers. However, this study seems to contradict Barclaycard's well respected annual survey of travellers which found that 74% of this group used a low cost carrier in the previous year and that 30% of their business trips were made with a low cost carrier.

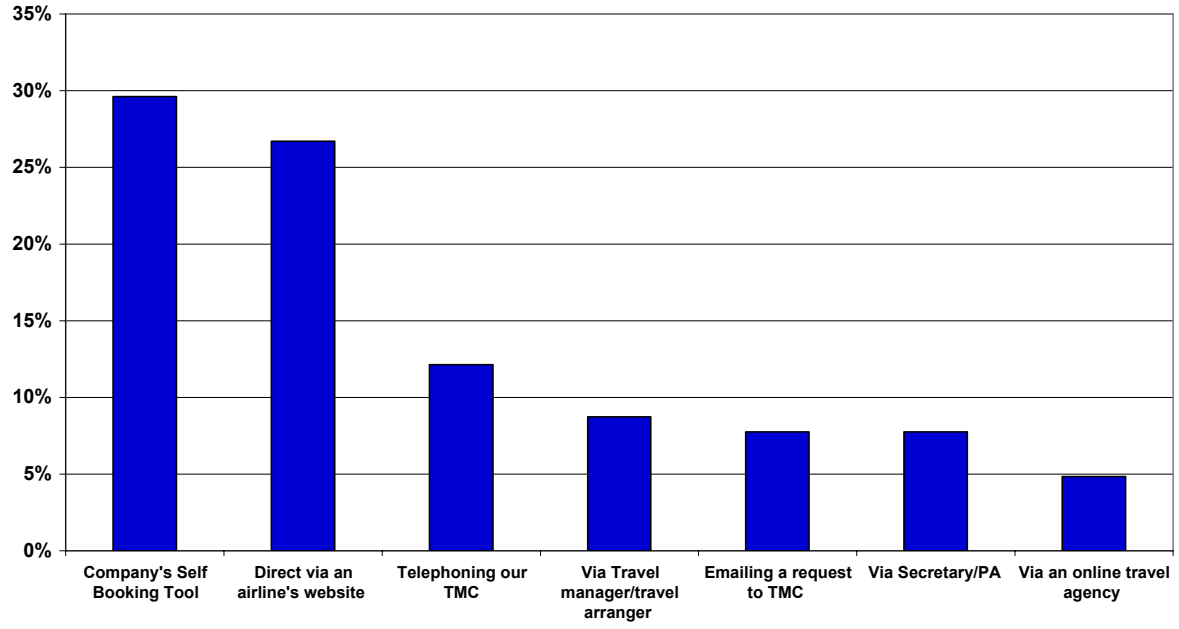
4.12.5 Online booking

A recent study by Carlson Wagonlit found that 83% of travel managers believed that virtually all bookings will be made online within five years. The figure shows that nearly 30% of respondents to a BTRC survey in 2006 booked their last business flight via their company's self booking system with a further 27% booking online direct from the airline's website. These figures are generally inline with other surveys published in 2006.

Estimates of the proportion of business travel booked online in 2006:-

- 58% American Express European Travel Management
- 51% Barclaycard
- 53% KDS/Association of Corporate Travel Executives

Figure 4-42: How business travellers make flight reservations



Source: BTRC, 2006

[13] TravelMole (2006), "Low cost a turn-off for business travellers", www.Travelmole.com, 23rd Jan.

The move online will provide companies with savings both in terms of lower air fares but also in terms of lower travel management company fees14

4.12.6 Delays and other travel issues

Delays and cancellations were, not surprisingly, identified as the main irritation to business travellers in a survey by TripAdvisor. 48% of the 2,100 travellers in this survey put this item as being most annoying. Being away from home and family was the second highest item at 25%. Given that the average number of days away is increasing (2.0 days per trip in 2005, 2.4 days per trip in 2006 according to Barclaycard), business travellers may find their travelling increasingly stressful and this may have a impact on company's Corporate Social Responsibility planning.

[14] Amadeus, (2007), "A study on the Adoption of Corporate Self Booking Tools", www.Amadeus.com.

Section 5

Airports

5 Airports

5.1 General traffic trends

ACI airports recorded world-wide growth in 2006, although the rate fell somewhat against that achieved in the previous year. 2006 saw passenger throughput increase by 3.8%, down from 2005's 5.5%. Asia Pacific airports were again in the lead, recording growth comfortable ahead of average. European airports posted significant increases in traffic, while North America remained at 2005 levels. See Figure 5-1.

Cargo traffic performance recorded the same ranking among the three regions. The corresponding increase in European cargo traffic, at 4.4%, was over three percentage point higher than North America's growth, but below the 6.0% recorded by Asia Pacific airports.

Figure 5-1: ACI airports by region, 2006 traffic change over 2005

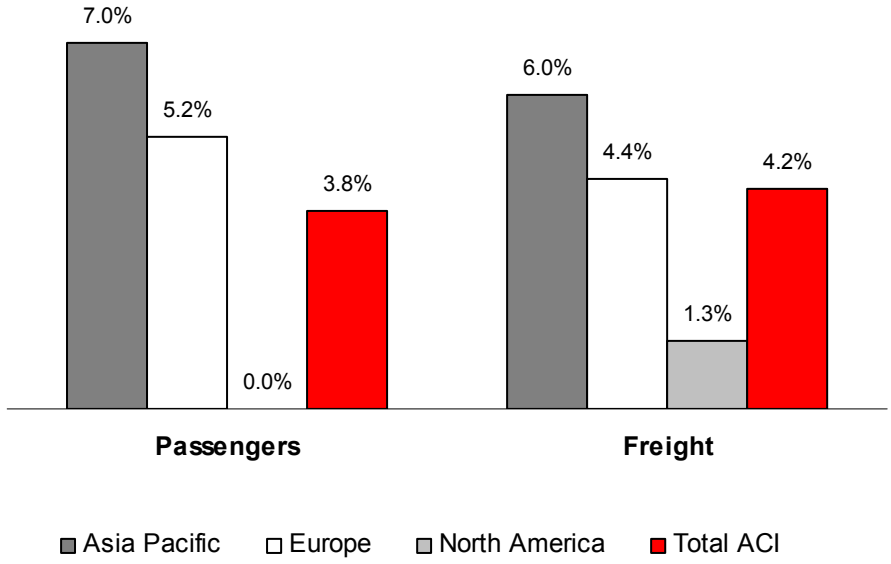
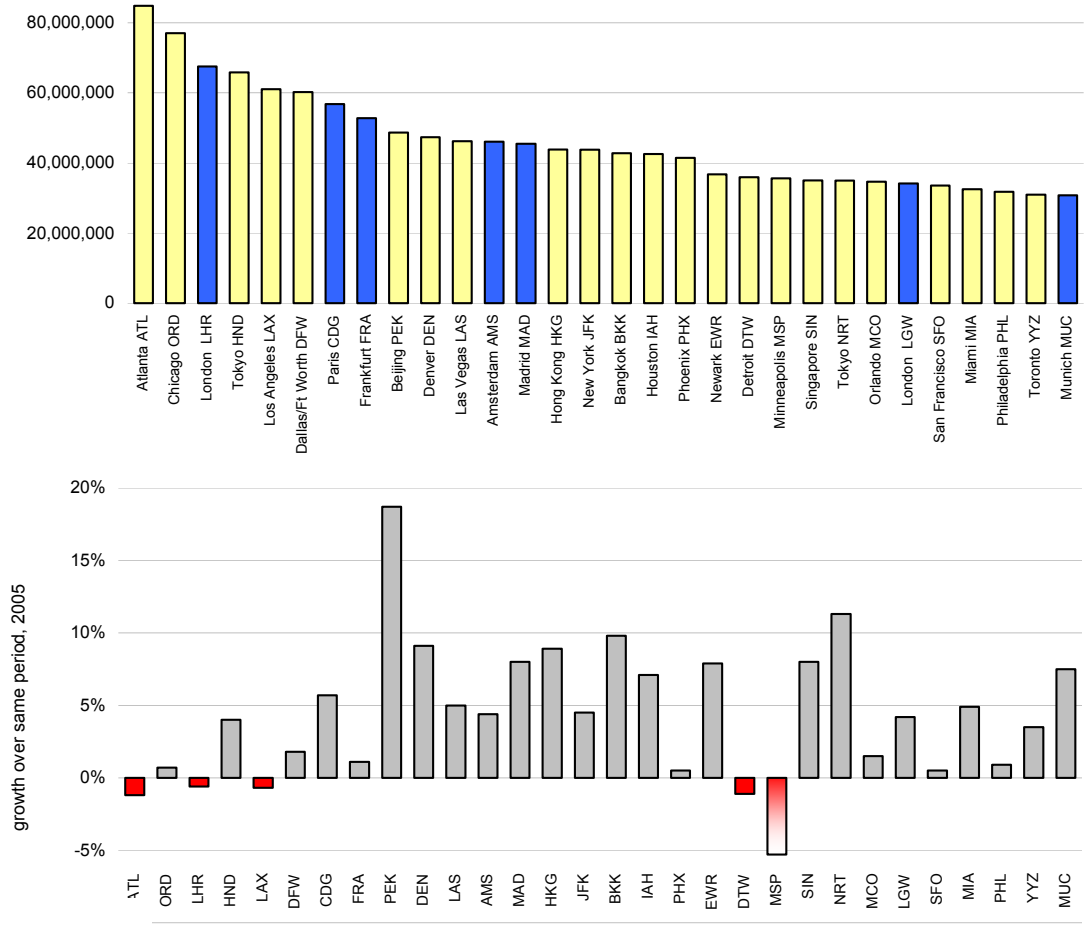


Figure 5-2 shows the place of European airports within the world's thirty busiest in 2006. US airports dominate the group in terms of passenger traffic. The combined passenger growth of these thirty airports was 3.8% over the previous year, but Europe's busiest airport, London Heathrow, suffered a fall in passenger throughput of just over one-half a percentage point, or around 400,000 passengers. Despite a drop of 1.2%, Atlanta maintained its lead as the world's busiest airport. Among the other top US airports, Denver posted a strong increase in passenger traffic, while Los Angeles fell below 2005 levels. Madrid was, again, Europe's fastest growing large airport in the world's top twenty, increasing its passenger traffic in 2006 by 8%. Paris CDG also showed strong growth.

However, the two fastest growing major airports in 2006, with double-digit growth, were in the Asian region. Beijing posted an annual growth rate of close to nineteen percent, while Tokyo Narita achieved eleven percent.

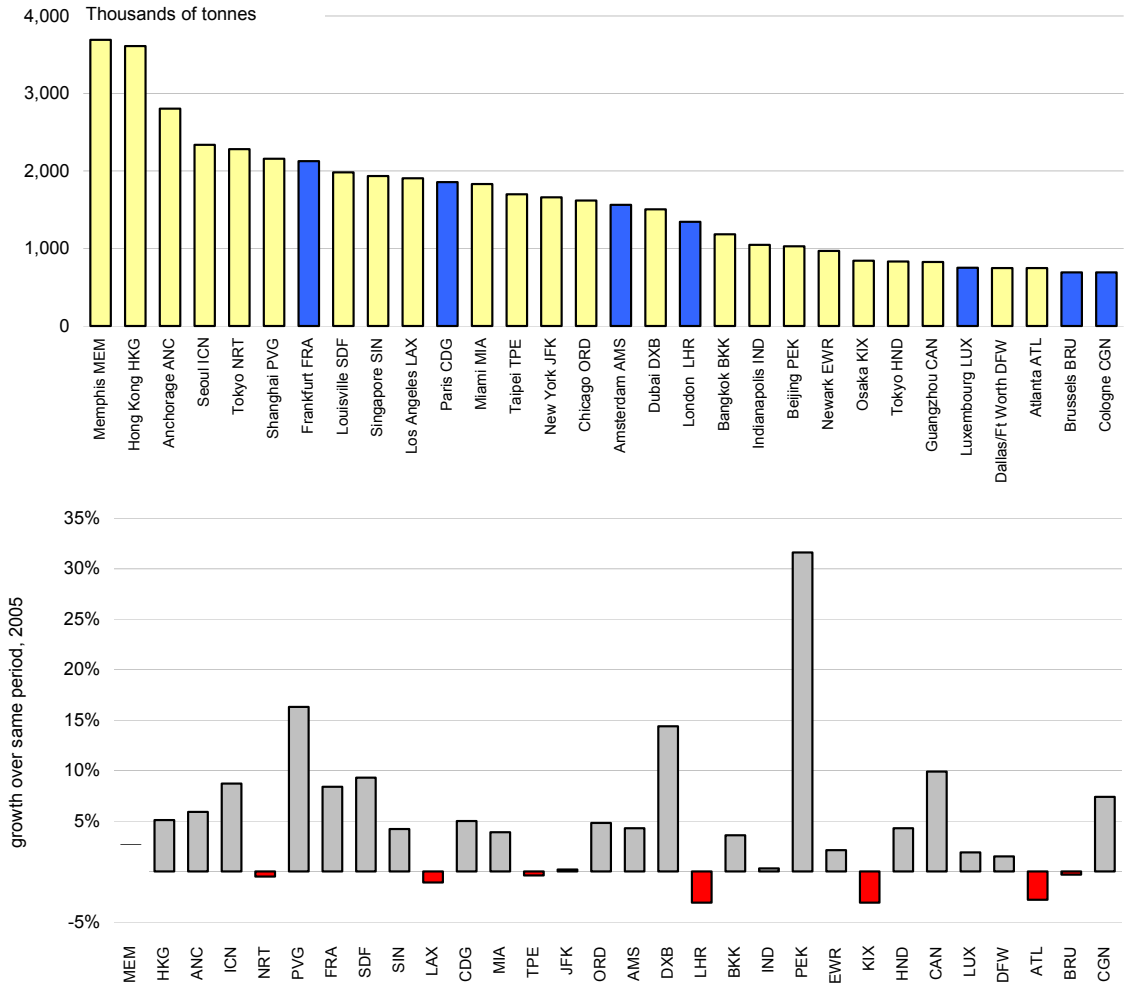
Figure 5-2: European airports in the world's top thirty (by passengers), 2006



Source: ACI

In terms of cargo traffic, Europe has seven airports in the world's top thirty. The ranking is dominated by US and Asian airports. Both New York and Tokyo each have two airports in the top thirty. Growth among this group of airports totaled over nine percent in 2006, fuelled by the very high increases in cargo throughput seen at China's airports. Beijing recorded a traffic increase of one-third, while Shanghai experienced around half that rate of growth. Of the European presence in the top thirty, the two German airports, Frankfurt and Cologne, both posted traffic up well above 7%, while of the remaining airports London Heathrow and Amsterdam reported falls in levels of cargo handled. The decline at Amsterdam was a modest one-third of a percentage point, but Heathrow's was over 3%.

Figure 5-3: Eurpopean airports in the world's top thirty (by cargo), 2006

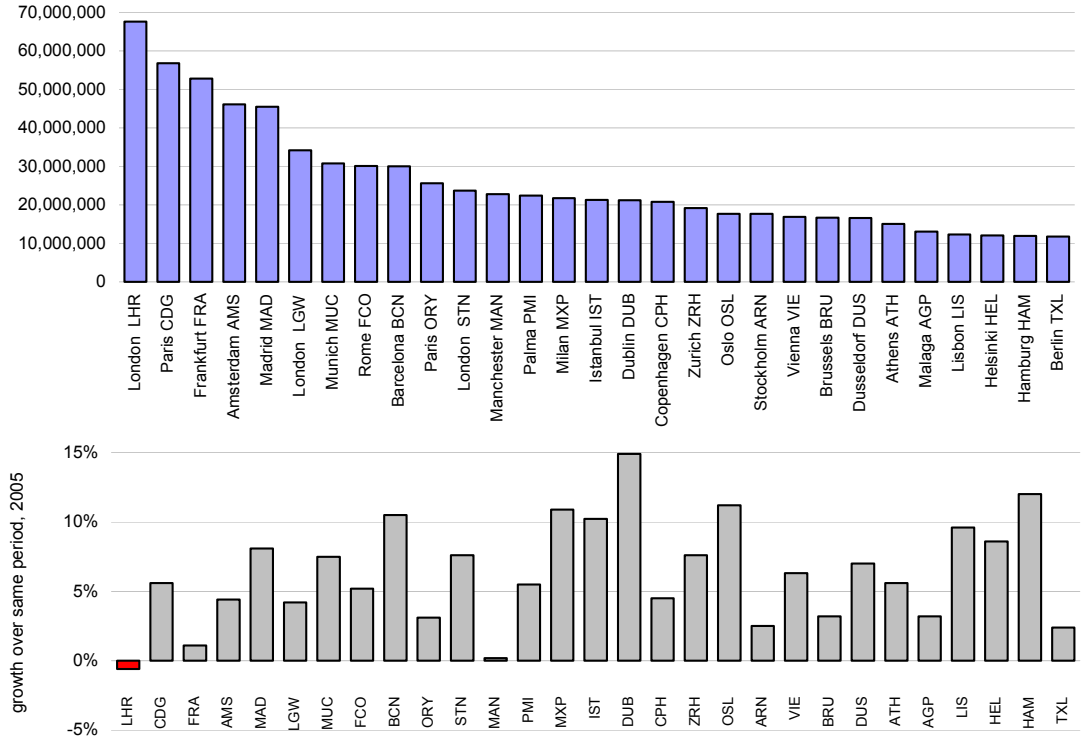


Source: ACI

5.2 Traffic growth at European airports

Average year-on-year growth of passenger traffic in 2006 at Europe's top twenty airports was 5.4%. As Figure 5-4 demonstrates, the average masks very high growth at a number of airports and quite disappointing performance in passenger terms at the continent's largest hub, London Heathrow, attributable in part to the disruption of airline schedules following terrorist threats. In absolute passenger terms, Paris CDG was in top position, generating an additional three million passengers in 2006, translating into 5.6% growth. Dublin achieved the highest rate of passenger increase, at close to 15%, but Barcelona, Hamburg, Istanbul, Milan Malpensa, Istanbul, and Oslo all recorded annual increases in passenger traffic greater than ten percent.

Figure 5-4: Passenger traffic at the top thirty ACI Europe airports, 2006

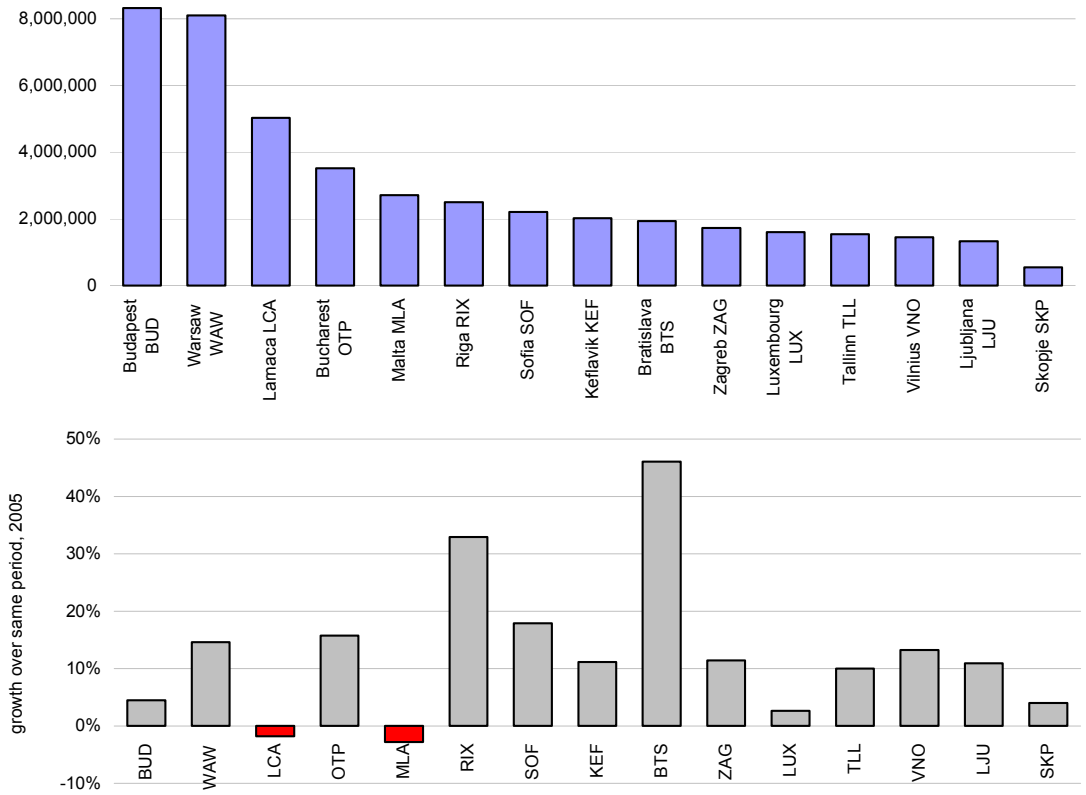


Source: ACI Europe

There were significant levels of growth in passenger traffic at many of Europe's smaller airports (Figure 5-5). The accession states once more figured among the airports returning the highest growth statistics. Growth rates at Bratislava fell from last year's high, but still achieved 48%. Riga's growth also slowed somewhat, by dropped only to 33%. Expansion in traffic from both Bratislava and Riga airports was from a relatively low base, and quite clearly the activities of low-cost carriers were essential to fuelling, and maintaining this growth.

The tourism oriented airports of Malta and Larnaca again recorded a reduction in passenger throughput, for the third successive year. The reasons seem likely to be shifts in the tourism market, as long-haul markets become more attractive to package tourists and LCC divert independent travelers to their networks focused heavily on other European destinations.

Figure 5-5: Passenger traffic for a selection of smaller European airports, 2006



Source: ACI Europe, ATI and airport websites

5.3 Developments in airport ownership

The top twenty airport authorities in terms of operating revenue in the European Economic Area are listed in Table 5.1. Also included are the top two airport authorities from the group of accession states. The table also lists the core airports (fully owned) associated with these entities. Some airport authorities such as Letiste Praha are responsible for managing one airport while there are several examples of airport authorities managing networks of airports such as Sweden's LFV and Portugal's ANA. It is necessary to also highlight the fact that several of the listed airport authorities are also the designated national operator of air navigation services within their respective territorial jurisdictions (AENA, Avinor, Luftfartsverket and Finavia).

Table 5.1: Top twenty EEA airport operators and top two from accession states

	Core airports (parent company)
BAA (UK)	Heathrow, Gatwick, Stansted, Aberdeen, Edinburgh, Glasgow, South'ton
Aena (Spain)	Madrid, Barcelona and 44 other Spanish airports
Fraport (Germany)	Frankfurt Main
Aéroports de Paris (France)	Paris Charles de Gaulle, Paris Orly, Paris Le Bourget and 10 airfields
Schiphol Group (Netherlands)	Amsterdam, Rotterdam, Lelystad
Flughafen München (Germany)	Munich
Avinor (Norway)	Oslo, Bergen and 44 other Norwegian airports
LFV (Sweden)	Stockholm Arlanda, Gothenburg & 14 other Swedish airports
Aeroporti di Roma (Italy)	Rome Fiumicino, Rome Ciampino
Manchester Airports Group (UK)	Manchester, East Midlands, Bournemouth, Humberside
Dublin Airport Auth'y (Ireland)	Dublin, Cork, Shannon
SEA Aeroporti di Milano (Italy)	Milan Linate, Milan Malpensa
Flughafen Wien (Austria)	Vienna
Unique Zurich Airport (Switz'd)	Zurich
Copenhagen Airport (Denmark)	Copenhagen Kastrup, Roskilde
Athens International (Greece)	Athens
Brussels Airport	Brussels
Flughafen Düsseldorf (Germany)	Düsseldorf
ANA Portugal	Lisbon, Porto, Faro, Horta, Ponta Delgada, Santa Maria, Flores
Finnavia (Finland)	Helsinki and 25 other Finnish Airports
Polish Airports State Ent (Poland)	Warsaw, Rzeszów, Zielona
Letiste Praha (Czech Rep)	Prague

Source: complied from airport annual reports and other sources

Table 5.2 lists the proportion of share capital held by the private sector, national government, regional government and municipal authorities at the end of 2006. In 2006, Aéroports de Paris, which had been functioning as state-owned enterprise, was partially privatised with 32.5% of shares floated on the Paris stock market. In contrast, BAA was de-listed in 2006 following the purchase of all its shares on the London Stock Exchange by Ferrovial. In another development, the UK Office of Fair Trading began an investigation into BAA's alleged market dominance of the airport markets in London and Scotland.

Out of the twenty-two airport authorities above, there are only three that that have at least a partial share listing on their respective national stock exchanges; Fraport, Unique Zurich Airport and Copenhagen Airport. In the case of Fraport, Lufthansa which held 4% of free floated shares in 2005 increased their stake to 9% in 2006. The airline's interest in airports also extends to Munich where they jointly financed, with the airport operator, the construction of Terminal 2 (opened in 2003).

Table 5.2: Share ownership structure of major EU airport companies, 2006

	Private sector	National government	Regional government	Municipal
BAA	100			
Aena		100		
Fraport	41.42	6.58	31.70	20.30
Aéroports de Paris	32.50	67.50		
Schiphol Group		75.80		24.20
Flughafen München		26.00	51.00	23.00
Avinor		100		
LFV		100		
Dublin Airport Authority		100		
Manchester Airports Group				100
Aeroporti di Roma	96.99		1.58	1.43
SEA Aeroporti di Milano	0.88		14.56	84.56
Flughafen Wien	60.00		20.00	20.00
Unique Zurich Airport	47.84		46.76	5.40
Copenhagen Airport	60.80	39.20		
Athens International	45.00	55.00		
Brussels	70.00	30.00		
Flughafen Düsseldorf	50.00			50.00
ANA Portugal		100		
Finnavia		100		
Polish Airports State Enterprise		100		
Letiste Praha (former Czech Airports Authority)		100		

Source: complied from airport annual reports and other sources

Table 5.3 lists for the top twenty-two operators their airport interests by region. These interests can take on a variety of forms such as equity stakes (full or partial), concession contracts or management contracts. Fraport has the most geographically diverse range of airport assets. Flughafen München, Avinor, LFV, Manchester Airports Group, Athens, Brussels Airport, Flughafen Düsseldorf, Finavia and Letiste Praha (Prague airport) have no other interests other than their core airport assets.

Following its take-over by Ferrovial, BAA appears to have started the process of divesting itself of its overseas assets. BAA secured a 75% equity stake in Budapest Airport from the Hungarian Government in December 2005 in a transaction worth €1.9 billion. The take-over of BAA by Ferrovial in 2006 appeared to have prompted a review of BAA's overseas assets. In the second half of 2006 BAA entered into negotiations with a consortium led by Hochtief, one of the losing bidders in the 2005 tender, over the sale of its Budapest equity stake. These negotiations concluded with the signing of a memorandum of understanding in October 2006 followed by EU regulatory clearance in December. Hochtief expanded their portfolio further in 2006 by acquiring Aer Rianta International's (Dublin Airport Authority subsidiary) stake in Hamburg. Fraport was also active in 2006, leading a consortium that won the tender to operate Delhi in India and securing the concession to manage Bourgas and Varna airports in Bulgaria. In the latter case, Copenhagen Airport had originally secured the concession to operate both airports in 2005 but a Bulgarian Court ruled against the transaction on the grounds that Copenhagen Airport was not suitably qualified. Aéroports de Paris secured a management contract to operate Muscat and Salalah in Oman, both of them previously managed by BAA. Flughafen Wien increased its stake in Malta to 10% and led a consortium

that secured an equity stake in Bratislava and Kocise airports in Slovakia. In Finland, 2006 marked the first financial year under new airport management and regulatory arrangements. The old CAA was disbanded and regulatory functions transferred to a new authority while management of airports and air navigation services passed to a new state-owned entity called Finavia.

Table 5.3: Major European airport operator interests in other airports, 2006

	N America	Europe	Middle-East / Africa	Asia	South & Central America	Australasia
BAA	Baltimore Pittsburgh Indianapolis Boston	Naples				Australia Pacific Perth Melbourne Launceston N Territories
Aena					GAPA Mexico Cartagena Calli Barranquilla	
Fraport		Hahn Hannover Antalya Bourgas Varna	Cairo Sharm-el-Sheik	Delhi	Lima	Brisbane
Aéroports de Paris		Liege	Muscat Salalah	Beijing Phnom Penh Siem Reap	GACN Mexico	
Schiphol Group	JFK (IAT)	Eindhoven			Aruba	Brisbane
Dublin Airport Authority		Birmingham Dusseldorf				
Aeroporti di Roma		Genova SAC				
SEA Aeroporti di Milano		Naples Orio al Serio Rimini			Argentina Guayaquil	
Flughafen Wien		Istanbul Malta Riga Cuidad Rea Bratislava Kocise	Tehran			
Unique Zurich Airport				Bangalore	Porlamar Calama La Serena Puerto Mont	
Copenhagen Airport		Newcastle		Hainan	ASURMexico	
ANA Portugal		ANAM		ADA		
Polish Airports		Bydgoszcz Gdańsk Katowice Kraków Poznań Szczecin Szczytno-Szymany Wrocław				

While several EU-based airport authorities have accumulated airport assets overseas, other entities such as infrastructure investment funds, construction companies and transport operators have also participated in airport privatisation transactions. Table 5.4 lists these types of investors and the geographic location of their airport assets.

Table 5.4: European non-airport investors' interests in other airports, 2006

	N America	Europe	South & Central America	Australasia
TBI	Atlanta Burbank Sanford	Belfast International Cardiff Luton	Cochaabamba La Paz Santa Cruz San Jose	
Ferrovial		Aberdeen Belfast City Edinburgh Gatwick Glasgow Heathrow Southampton Stansted		
Hochtief		Athens Budapest Dusseldorf Hamburg Tirana		Sydney

5.4 Regulation and government policy

5.4.1 European Commission

The European Commission called for greater transparency and commonality in the application of security-related airport charges.

In relation to state aid to airports, the Commission approved capital investment grants awarded by the Irish Government to its regional airports. The Commission also confirmed that public financing of security infrastructure at airports does not constitute state aid. However, there was also ruling in 2006 that routes linking EU airports with non-EU airports could not qualify for state-funded route development fund support. There are currently a number of state-funded route development schemes in the UK.

Also in 2006, the European Commission communicated a final warning to Malta in relation to alleged discrimination with regard to its airport tax. According to the Commission, the tax is discriminatory because firstly it is only levied on passengers starting their international journeys from Malta and secondly it does not apply on the domestic Malta-Gozo route.

5.4.2 France

Air France launched a complaint with France's Conseil d'Etat against Marseille Airport over alleged discrimination in favour of Ryanair with respect to the new low cost passenger terminal. The national carrier alleged that the new facility is being cross-subsidised by users of existing terminal facilities.

IATA initiated legal proceedings against the French Government over its decision to allow Aéroports de Paris to raise aeronautical charges by 26% over a five year period. The basis of the complaint alleges that there are deficiencies in the economic regulation contract between the state and the airport operator.

5.4.3 United Kingdom

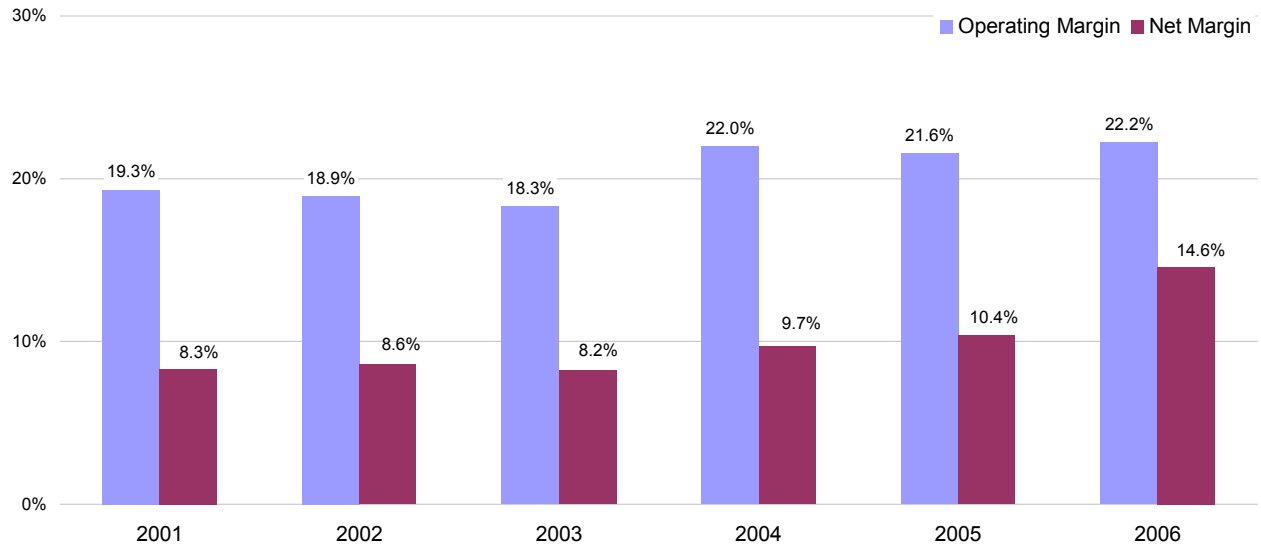
The UK Office of Fair Trading started an investigation into the structure of the UK airport market. The focus of the investigation was on BAA's position with the London and Central Scotland markets. The investigation was prompted by airline concerns that BAA's dominance had reduced incentives on the company to improve quality of service at its

airports. The potential outcome of this process, which involves several stages, could be a requirement on BAA to dispose of some of its UK airport assets. Also in the UK, the government announced that night flying restrictions would remain at BAA London airports until 2012 and that night flying allowances would be reduced at London Gatwick.

5.5 Financial performance

Operating margin declines from 2001 to 2003 followed by a sharp improvement from 2003 to 2004, and then a very modest increase between 2005 and 2006 (Figure 5-6).

Figure 5-6: Aggregate results for some leading EEA airport operators 2001 -2006.



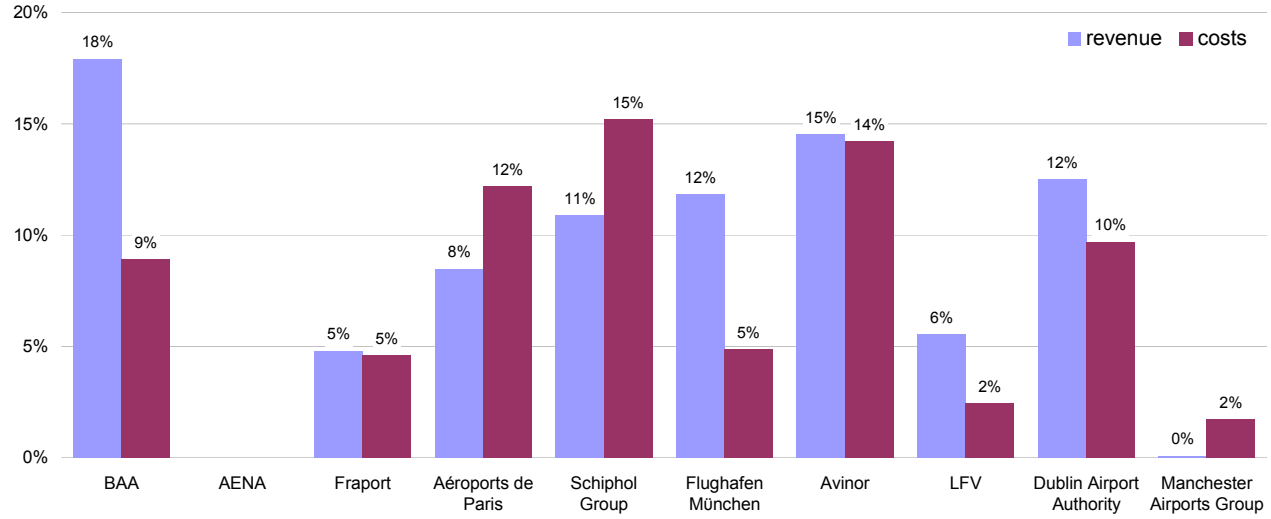
Source: complied from airline business survey of airports and airport annual reports

While traffic volumes continue to grow at major European airports, having a positive effect on airport yields, cost pressures continue to rise mainly as a result of increased security requirements. All EU airports were forced to adopt new security regulations in November 2006 which have forced many operators to increase operational staff numbers.

Net margin across the sample, in contrast, has risen sharply from 10.4% in 2005 to 14.6% in 2006. Significant gains in net margin were made by both Schiphol and DAA.

In terms of operating revenue, the strongest growth was reported by BAA followed by Avinor, Flughafen München and the Dublin Airport Authority. These increases were mainly driven by robust traffic performance at core airports during the year. However, there were also significant operating cost increases across Europe's airports particularly at Schiphol and Avinor. In both cases, the increases were driven additional security requirements

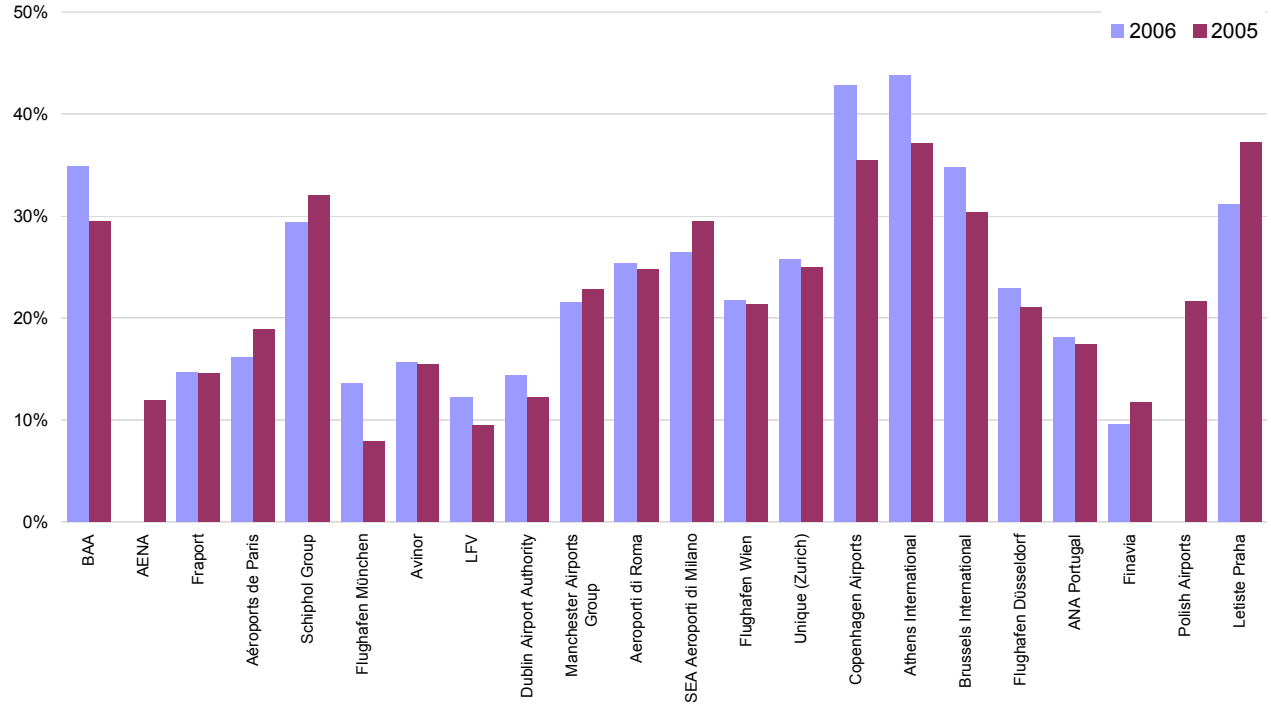
Figure 5-7: Change in operating revenues and operating costs, top ten EEA airport operators, 2006



Source: complied from airport annual reports

Figure 5-8 shows operating margin achieved by each EEA airport operator in 2005 and 2006. Athens and Copenhagen airport achieve the highest operating margins. Letiste Praha's decline in operating margin was mainly due to rising depreciation charges linked to additional capital investment. Financial statistics for 2006 have yet to be published for Aena and Polish Airports.

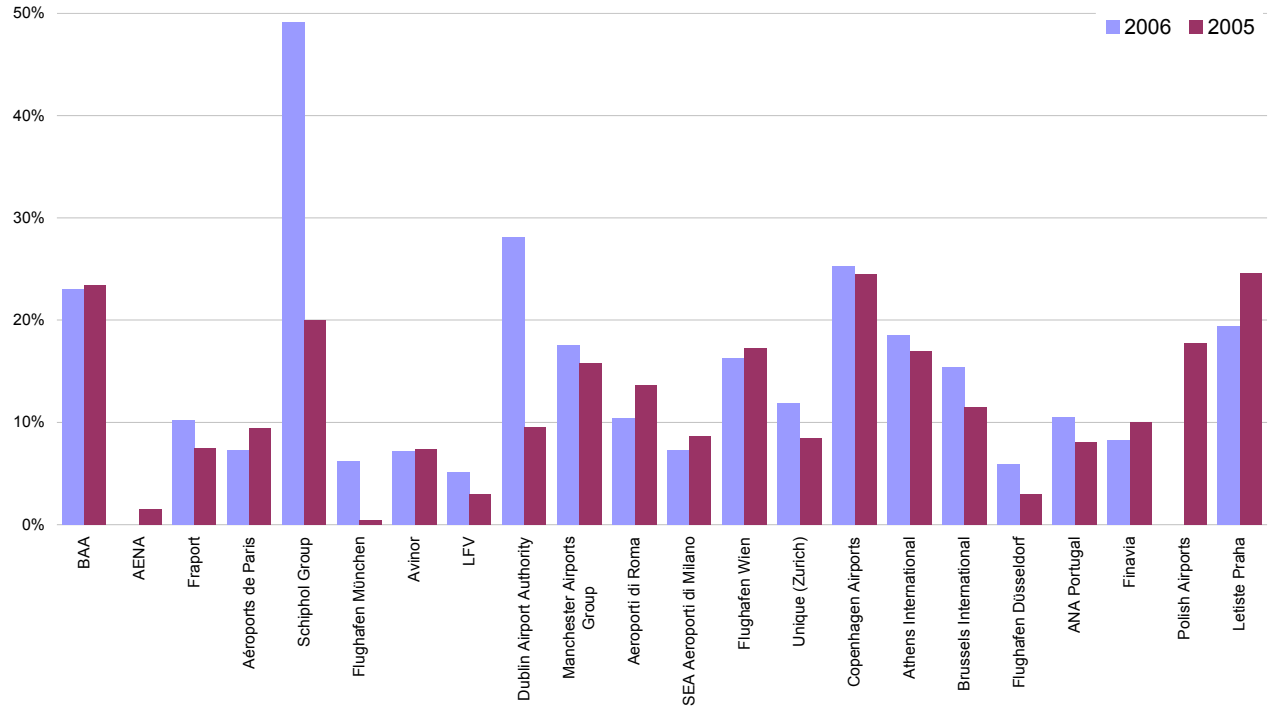
Figure 5-8: Operating margins, EEA airport operators, 2005 and 2006



Incorporating the effects of interest income, expenses and taxation, twelve operators achieve an improvement in net margin between 2004 and 2005 (Figure 5-9). Noteworthy gains were

made by Schiphol Group, the operators of Amsterdam and Dublin Airport Authority, the operator of Dublin, Cork and Shannon Airports. In the former case, the improvement was due to an agreement with the Dutch tax authorities relating to additional non-recurring income. Without this, the underlying increase in net profit margin was 7.2%. In the latter case, the increase at Dublin Airport Authority is mainly due to proceeds received from the sale of its Great Southern Hotels subsidiary.

Figure 5-9: Net margin by EEA airport operator 2005 and 2006



5.6 Key developments EEA top ten airport operators

5.6.1 BAA

The most significant development for BAA in 2006 was the take-over by Ferrovial and its subsequent de-listing from the London Stock exchange. The UK Office of Fair Trading undertook a preliminary investigation into its alleged dominance of the airport markets of London and Central Scotland. The OFT has referred this case to the UK Competition Commission. One possible outcome could be the recommendation that BAA sell some of their core UK airport assets.

The company received a number of set-backs regarding its development plans at Stansted. The local district council turned down an application by BAA to remove the annual 25 million passenger limit which has been imposed on the airport. Also the UK government announced that night flying restrictions would remain until 2012. Aberdeen, on the other hand, was allowed to proceed with plans to extend its runway.

Due to changes in accounting methods introduced following the take-over by Ferrovial it is not possible to make comparisons with financial performance in the previous year. In the 9-months to December 31, 2006, the company generated an operating margin of 35% on operating revenue of €3.9 billion.

BAA airports overall handled 3% more passengers in 2006 compared to 2005 with particularly robust growth reported at Aberdeen and Stansted.

5.6.2 Aena

Aena announced plans to spend €68 million expanding both terminal and runway infrastructure at Valencia.

Information regarding Aena's financial performance in 2005 was not available at the time of writing.

5.6.3 Fraport

A Fraport-led consortium secured a 30-year contract to manage and develop Delhi International Airport in India. Fraport also secured an equity stake in Bourgas and Varna airports in Bulgaria. There were also developments regarding the company's controversial contractual arrangements in the Philippines (New Manila Airport terminal). Fraport received €29 million as an initial payment as part of a compensation claim. Also in 2006, Fraport completed the sale of its 40% equity stake in Portuguese handling company Portway to ANA.

There was a modest 4.8% increase in revenue from 2005 with faster growth reported from retail activities. Operating costs rose by 4.5% resulting in a slight improvement in operating margin from 14.5% to 14.6%. Net margin rose from 7.5% to 10.1%. Passenger traffic handed at Frankfurt airport increased by 1.1% over the period.

5.6.4 Aéroports de Paris (AdP)

2006 was a significant year for AdP. The airport operator was partially privatised with 32.5% of shares floated on the Paris stock market. The privatisation was controversial raising concerns by the airline industry over the potential impact on charges. Indeed, the French Government allowed AdP to increase aeronautical charges by 26% over a 5-year period. This prompted IATA to initiate legal proceedings citing deficiencies in the economic regulation contract between the state and AdP.

In 2006, AdP secured a 4-year management contract to operate Muscat and Salalah Airports in Oman - both airports had previously been operated by BAA.

AdP announced in 2006 that it was building a dedicated terminal at Paris Charles de Gaulle Airport for Air France and that it was investing €33 million in strengthening the runway at Paris Orly in preparation of the arrival of the Boeing 777-300.

AdP achieved revenue growth of just over 8% due to continued traffic growth at its core airports and the effects of higher aeronautical charges. Operating margin however declined from 18.8% to 16.5% mainly due to the combined effect of increased operating costs and extraordinary losses incurred related to the share floatation. Passenger traffic at its core airports increased by 4.8% in 2006 with faster growth reported at Paris Charles de Gaulle compared to Orly.

5.6.5 Schiphol Group

A new Aviation Act came into effect in July 2006 which set out new limits on aeronautical charges and transferred responsibility for the economic regulation of Amsterdam Airport from the Ministry of Transport, Public Works and Water Management to the Netherlands Competition Authority.

Schiphol Group achieved a 10.8% increase in operating revenue in 2006. Strong growth was reported in both aviation and retail segments. However, operating costs rose by a more significant margin (15%) due to the combined effects of additional security resourcing and higher energy prices. Amsterdam airport handled 4.8% additional passengers in 2006 with faster growth reported in the origin-destination market due to the effects of low cost airlines.

Transfer traffic, which still accounts for a large proportion of passenger movements, grew by just over 2% over the period.

5.6.6 Flughafen München (Munich Airport)

Buoyed by rapid traffic growth and Lufthansa's expanding operations at Munich, the operator, Flughafen München GmbH, submitted a planning application to the government of Upper Bavaria for a third runway. Assuming there are no delays in the approvals process, the company expects the third runway to be fully operational by 2011.

Munich Airport handled 7.5% more passengers in 2006 than in 2005. Operating revenues rose by 11% over the same period while operating costs increased at a much slower rate of 4.8%. As a result there was a significant improvement in operating margin from 7% to 13% over the period. There was also an improvement in net margin from 0.41% to 6.24%.

5.6.7 Avinor

Operating revenue increased by 14.5% between 2005 and 2006. This increase was driven by strong traffic growth across its airport network. Oslo Gardermoen experienced a 10% surge in traffic during 2006. The Norwegian operator is also reporting impressive commercial revenue growth, with this segment now representing 42% of total revenue compared to 36% in 2005. However, operating costs have also increased by a similar magnitude due to the implementation of new safety and security measures. It is also worth pointing out that Avinor no longer receives a subsidy for operating small remote airports in the North. Operating margin remains more or less unchanged while there is a slight reduction in net margin over the period.

5.6.8 LFV Group

In 2006, the LFV group was managing a smaller number of airports due to the transfer of some small loss-making regional airports to local authorities. This initiative was part of a business plan to improve revenues and cut costs. Operating revenues increased by 5.5% in 2006 compared to a more modest increase in operating costs of 2.4%. Operating margin increased from 9.4% to 12.2% while net margin also improved 2.9% to 5% over the same period. Passenger traffic handled by all LFV airports increased by 3% overall while there was growth of 7% on international routes. Growth, however, remains elusive in the domestic market where some of the smaller regional airports continue to face declining traffic volumes. This is mainly due to airline capacity cut-backs in the domestic sector.

5.6.9 Dublin Airport Authority (DAA)

In 2006, Fingal County approved a planning application submitted by DAA to construct a new parallel runway, expected to become operational around 2012/2013.

The High Court in Dublin overturned a decision by the Commission for Aviation Regulation (CAR) which had designated Dublin Airport as slot coordinated. The Court based its judgment on the grounds that CAR had not followed correct procedures as set out in the EC Regulation on slot allocation.

Operating revenue increased by 12.5% in 2006 as a result of the combined effects of strong traffic growth and higher aeronautical charges. Operating costs increased at a more modest rate (9.7%). There was an improvement in operating margin from 12.2% to 14.3% between 2005 and 2006. Net margin rose significantly over the period from 9% to 28%. This was mainly due to the effects of extraordinary income from the sale of DAA hotel assets and its equity stake in Hamburg.

5.6.10 Manchester airports group (MAG)

Passenger traffic handled by the four MAG airports; Manchester, Nottingham East Midlands (NEMA), Bournemouth and Humberside increased by just over 3%. The fastest growth was recorded at NEMA (20%). A very modest 0.1% growth in operating revenues was recorded between financial years 2005/6 and 2006/7. This was mainly due to the effect of declining yields from aeronautical activities as a consequence of price reduction initiatives. Operating costs rose modestly by just over 1%. There was a slight fall in operating margin over the period but net margin improved from 15.6% to 17.6%.

Section 6

Air traffic management

6 Air traffic management

6.1 Galileo

6.1.1 International collaboration

A trilateral steering board was created for discussions between the EC, European Space Agency and Russia's Federal Space Agency (FSA). The European space Agency (ESA) already had working groups covering areas of co-operation under its framework agreement with the FSA, including satellite communications, global navigation and technology. These will include EC representatives and will report to the new steering board. A new working group on Earth observation was also created. On wider space issues, the FSA is planned to work with the EC through the steering board and the European Union's Seventh Framework research and technology programme. It was anticipated that Russia may provide electro-optical assets for the new EC/ESA Global Monitoring for Environment and Security initiative, which accounts for a substantial part of the space funding.

EADS Astrium and Lockheed Martin announced plans to work together to ensure the interoperability of the European Galileo and USA's GPS III satellite navigation systems. The companies also intend to offer reciprocal bids on operational hardware and software, subject to European and USA export policies.

6.1.2 Satellite development

The first test satellite for Europe's Galileo satellite navigation system entered its correct orbit and was transmitting after its launch on 28 December 2005. The 600kg (1,320lb) Galileo In Orbit Validation Element (GIOVE)-A satellite, built by Guildford, UK-based Surrey Satellite Technology (SSTL), was launched from Baikonur in Kazakhstan on a Starsem Soyuz booster with a Fregat upper stage. The four-stage booster placed the spacecraft in a medium Earth orbit of around 24,000km (14,900 miles) following three engine burns by the Fregat's fourth stage. The satellite started transmitting navigation signals from its L-band phased-array antenna, on the L-1 and L-5 frequency bands, on 12 January 2005. Evidence of the transmissions was given to the International Telecommunications Union (ITU) and ESA confirmed that the Galileo frequencies were secured.

The launch of the second test spacecraft, the **Galileo** Industries-built GIOVE-B, was delayed following problems with testing and is intended to test the atomic clocks needed for calculating user position and spacecraft orbital mechanics.

6.2 Single European Sky

6.2.1 Political

Greece was taken to the European Court of Justice by the European Commission, which said the state had failed to establish a national supervisory authority required to prepare nations for the Single European Sky air transport initiative. Under the Single European Sky framework regulations, European Union member states are required to separate the provision of air navigation services from their supervision and regulation. The EC says it is taking Greece to court after failing to receive satisfactory responses to two reasoned opinions, sent in June and December 2006.

6.2.2 Performance review commission

Eurocontrol and its Performance Review Commission (PRC) began to examine the Single European Sky (SES) implementation process and to provide the European Commission with a detailed report on progress. The PRC reported that, although air traffic management (ATM)

cost-efficiency is projected to improve, adequate safety reporting is conducted by only 15 of the 25 European Union countries. The review was part of a regular reporting process designed to enable the EC to advise the European Parliament whether any changes to the SES legislation or provisions are required.

The PRC's latest annual report (for 2005, published in 2006) indicates that, although overall delays are not bad, both en-route delays and airport-caused delays are on the increase, safety reporting from most member nations' air navigation service providers is poor, and although the performance of most area control centres (ACC) is good, it is getting worse at others. The PRC also quantified the levels of inefficiency created by "fragmentation" – the fact that ATM is provided by too many ANSPs with too many small ACCs.

6.2.3 Technical developments

Eurocontrol awarded the first contract in its TMA2010+ programme, aimed at improving the way in which aircraft arrivals and departures are managed at Europe's increasingly crowded airports. Under the €117,000 contract, QinetiQ were to work with Boeing Research & Technology Europe to review existing and planned aircraft management tools for air traffic controllers with the aim of developing new concepts for increasing airport capacity. The TMA2010+ programme brings in gate-to-gate routing concepts, co-operative air traffic management and the Single European Sky and will be extended after 2010 with two further phases, the timing of which has yet to be decided.

European stakeholders were also aiming to reach a consensus on the Single European Sky implementing rule governing air / ground data-link communications. Three proposals were put forward for a rule for regulatory coverage of the enabling technology to support initial mandatory data-link services. The first of these proposals was the most open to new technological development, requiring simply that any data-link technology must be able to comply with the requirements laid down by the Eurocontrol Link 2000+ data-link oversight programme. The second option was less flexible and prescribed the use of the Aeronautical Telecommunications Network (ATN) and the VDL Mode 2 data-link, to which airlines have been migrating in order to achieve faster ACARS communications. Europe's new VDL Mode 2 infrastructure is also the foundation for controller-pilot data-link communications (CPDLC). The third proposal built on the second by accommodating both ATN/VDL Mode 2 and the FANS-1/A data-link capability currently used in low-density, oceanic and remote-region airspace.

Cost-benefit analysis showed that either the first or second proposal would realise benefits of €1.71 billion for a cost of €191 million, while the third would require air navigation service providers to invest up to a further €2 million at each control centre to meet the extra communications requirement.

6.2.4 Technical and operational co-operation

Three European airspace authorities initiated a joint purchasing agreement centred on easing modernisation of their air traffic management systems. Under a programme termed Co-operation in the Procurement of Air Navigation Systems (COOPANS) the authorities of Sweden, Denmark and Ireland concluded a deal with French manufacturer Thales ATM. The three organisations – Denmark's Naviair, Sweden's LFV and the Irish Aviation Authority – had previously separately selected Thales to supply the company's Eurocat airspace management system for air traffic control. COOPANS will allow all three to pursue joint upgrades to these systems in order to meet operational demands, and other air navigation providers will have a similar opportunity. COOPANS will cover essential requirements

generated by the 'Single European Sky' programme and cut down the risks associated with introducing entirely new systems.

French and Swiss air navigation authorities developed a technical and operational co-operation strategy with a view to combining their countries' airspace into a single block – a block which could also expand to include parts of Italy. Joint designation of airspace responsibility between the two countries' air navigation providers – Switzerland's Skyguide and France's DSNA – could be achieved by 2008 if the plan goes ahead. It follows the submission of a feasibility study into creating a unified functional airspace block to Swiss and French civil and military regulators. Swiss and French airspace control is not strictly divided along the geographical border between the two states. Skyguide is already responsible for a section of adjacent French airspace; this accounts for 20% of its activity. The two sides state that a combined functional block of airspace would enable them to improve collaboration and coordination.

Representatives of nine Balkan region states held the first stakeholder consultation workshop in an effort to develop a functional airspace block for south-eastern Europe. The states involved in the project – known as SEE FABA – aim to examine strategic proposals for managing air traffic in the region in order to reach a political decision in early 2009 on implementing one or more such blocks. SEE FABA includes the states of Romania, Bulgaria, Albania, Montenegro, Croatia, Serbia, the former Yugoslav Republic of Macedonia, Bosnia and Herzegovina, and UNMIK Kosovo. The initiative was supported by Italy and Greece as well as ICAO, NATO and Eurocontrol. SEE FABA was started in 2005 and a first-phase study led in February 2006 to the launch of a definition phase. This will continue until 2009, when implementation is set to begin. Balkan region air routes link Europe with the Mediterranean, Middle East and parts of Africa. The area is busy and complex (a situation exacerbated by the closure of Kosovo airspace), centres such as Belgrade and Zagreb experience bottlenecks in traffic flow and traffic in the region is set to rise by up to 30% by the end of the decade. The SEE FABA programme is one of a number of air traffic management co-operation initiatives launched in the area.

A full merger of the Swedish and Danish air navigation organisations would potentially generate the strongest returns, even given the degree of difficulty involved in such a move. The Nordic upper area control centre programme, NUAC, had been examining three possible scenarios for closer co-operation between the Danish air traffic control service Naviair and its Swedish counterpart LFV/ANS. Two of these scenarios emerged as having a viable risk-return relationship. The first of these would comprise a full merger of Naviair and LFV/ANS into a single integrated organisation providing air traffic management across Danish and Swedish airspace, with a number of support functions outsourced. This would take four years to implement and could be completed by 2011. Alternatively the two service providers could remain independent and form a co-owned alliance company which would perform certain support functions but not joint airspace control. Annual savings from the merger scenario would amount to €23.1 million ($29.4 million) from 2020, against €9.2 million for the alliance scheme. Merger integration costs, however, would also be higher: some €30-35 million compared with €17-20 million for the alliance. Cost savings in both cases would be largely achieved by staff reductions but the analysis stated that these could be brought about by natural attrition and normal staff turnover.

It was recommended that the third co-operation option, designated NUAC/Skaane, be abandoned. This would have seen the two organisations remaining independent but co-owning a company to provide air navigation services in a common airspace block above flight level 285. As part of this scheme Naviair would have also taken control of the Skaane airspace over southern Sweden. However, the NUAC/Skaane option would not have

generated any annual savings. Implementation work on the new airspace control concept is expected to start in 2008.

Six countries started to examine the prospects for creating a single block of airspace covering the core area of Europe. The six states – Germany, France, Switzerland and the three Benelux countries – will carry out a feasibility study of the proposal, which will cover both upper and lower airspace and be completed in early 2008. Germany and the Benelux states have also begun exploring tighter co-operation. The four countries have a long-standing partnership through the Maastricht upper area control centre in the Netherlands.

6.2.5 Central European air traffic services, CEATS

The proposed CEATS centre was supposed to oversee control of upper airspace over eight countries, but the programme has been beset by political wrangling since an agreement to develop the centre was drawn up in 1997. At least five of these eight countries had to ratify this crucial agreement to clear the way for progress on the centre, and this was achieved in July 2004 when Bosnia signed behind Austria, Hungary, Italy and the Czech Republic. While representatives of the eight states agreed in April 2005 to press ahead with the programme, despite several outstanding issues, Eurocontrol indicated in early 2006 that it might have to implement CEATS on a smaller scale, partly because three of the eight CEATS states were losing interest in the programme. Four countries then reinvigorated efforts to consolidate some Central European upper airspace, abandoning the heavily-criticised single-centre concept in favour of a functional-block approach. Consequently, Austria, Bosnia, Hungary and Slovakia are to press ahead with the new approach following a formal decision in May 2006. The new programme will be initially based on current infrastructure and only move towards functional consolidation when clear cost benefits can be demonstrated.

6.2.6 Single European sky research initiative, SESAR

Boeing's air traffic management division sealed an agreement with the European Air Traffic Alliance consortium under which it would participate in the newly-launched definition phase of SESAR. Following an agreement with industry towards the end of 2005, the initiative was formally started in March 2006. Boeing will contribute to four specific areas within SESAR: market analysis of the role of ATM, setting of performance requirements, selection of target ATM concepts, and identification of a transition schedule for deployment of a new European ATM system. Its agreement with Air Traffic Alliance, the original driver behind SESAR, will also involve co-operation with avionics suppliers Honeywell and Rockwell Collins. Boeing, which has closely co-operated with Air Traffic Alliance since 2003, estimates the value of the agreement at around $750,000.

Partners in the consortium managing **SESAR** submitted the first of six deliverable items contained in the project's definition phase. The consortium said that this first item – a shared industry view of the present air traffic management environment, put together by airspace users, regulators, air navigation service providers and other industry representatives – had been completed on schedule. Five other deliverable items will be generated during the definition phase: performance objectives for a future air traffic management system, target concepts to achieve them, a deployment and implementation sequence, master-plan recommendations from the industry, and a six-year initial work programme for the subsequent development phase.

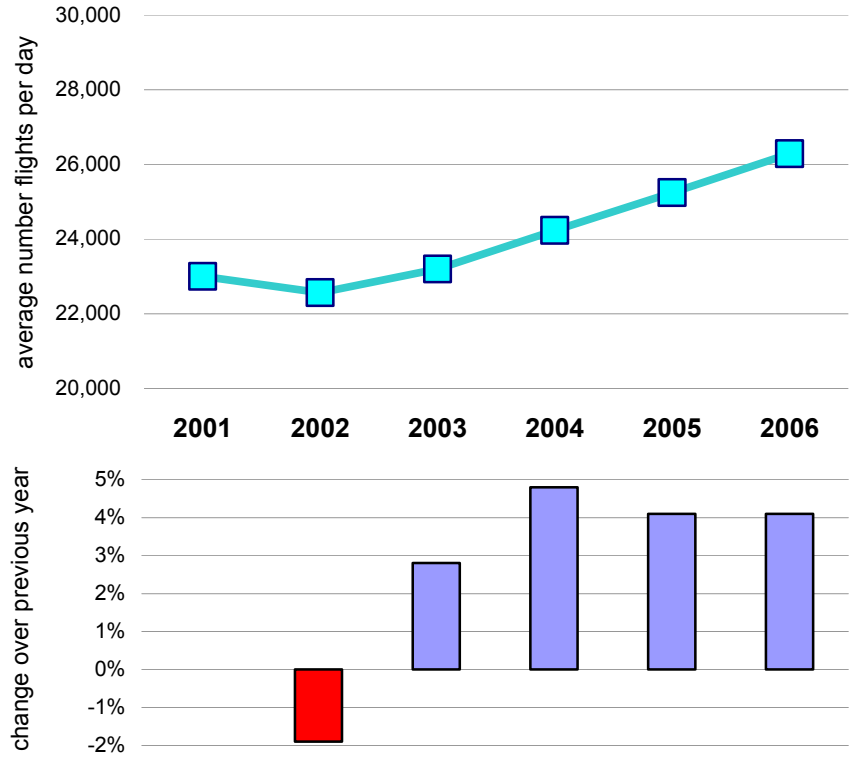
6.3 Eurocontrol

6.3.1 Traffic and capacity

Eurocontrol reports an average of 26,286 flights per day were handled by the Central Flow Management Unit (CFMU) in 2006 (Figure 6-1). This represented a total of some 9.6 million flights in 2006, a traffic increase of 4.1 % over 2005.

Domestic flights were up 3.2%, international traffic rose 4.9%.

Figure 6-1: Average daily CFMU traffic, 2001-2006

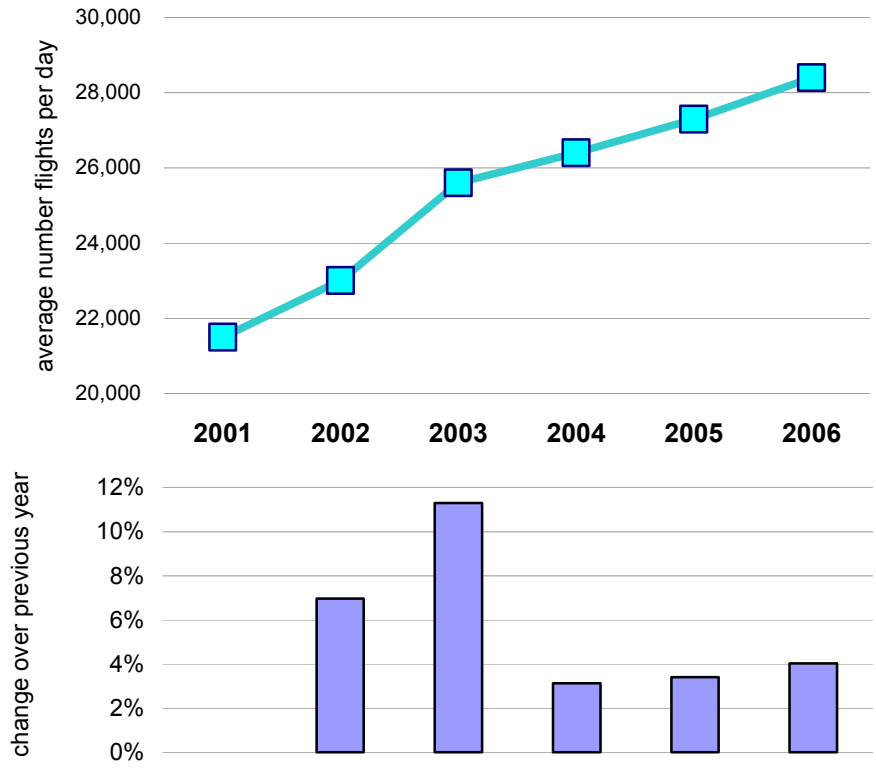


Source: Eurocontrol

The summer period was 4.3% busier in traffic terms than summer of 2005. Indeed, 15 September 2006 was the busiest day so far recorded, with 31,914 flights.

European network ATM capacity increased by 2.7% for the year as a whole, and 2.2% over the summer season. These increases were significantly below traffic, and average delay attributed to Air traffic Flow Management (AFTM) grew by 4.6% to an average of 1.9 minutes per flight over the year, and 2.2 minutes in the summer season.

Figure 6-2: Average daily capacity, in flights per day, 2001-2006



Source: Eurocontrol

6.3.2 Delay

Since 2001, traffic has increased by 14%, but delay per flight is down by 42% per flight.

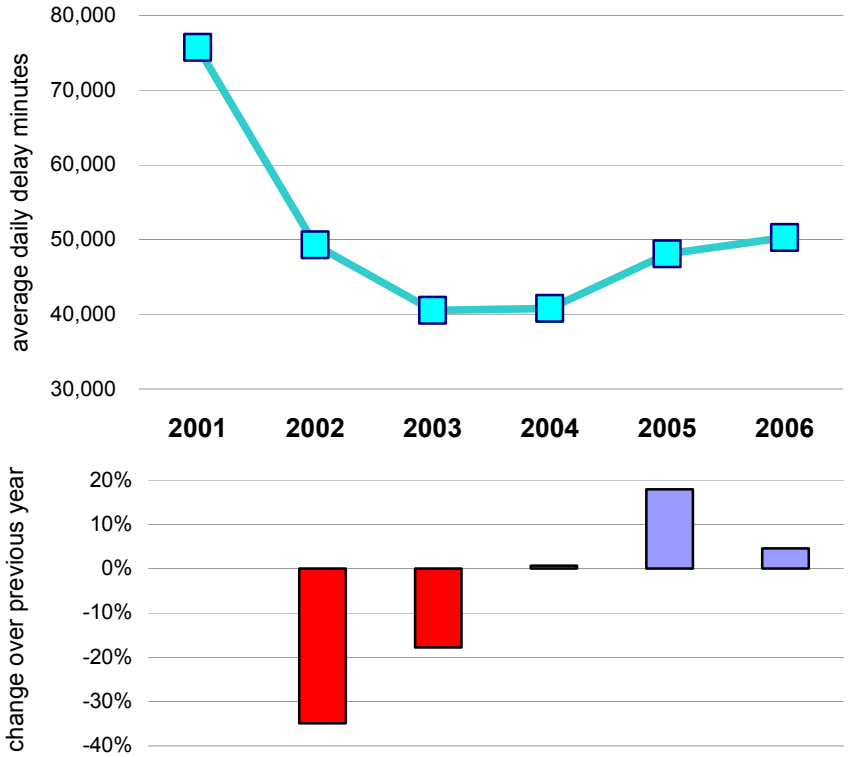
Clearly the impact of average delay per flight is exacerbated by increases in traffic levels. Figure 6-3 represents delay in the AFTM system in terms average minutes per day. Viewing the figure with Figure 6-1, the great improvement between 2001 and 2002 was at a time when traffic also fell significantly. The increase in average daily delay in 2006 was 4.6%, representing an improvement compared to 2005 (17.9%), a year where traffic growth was at very similar levels to 2006.

For individual departure airports, London Luton had the highest average delay per movement in 2006 (17.8 minutes) followed by Warsaw, Milan Malpensa, London Stansted and London Gatwick (the corresponding ranking for 2005 was Rome Fiumicino, Milan Linate, Milan Malpensa, Venice and Paris CDG). The highest average delay for destination (arrival) airports was at Istanbul Ataturk (19.0 minutes) followed by London Luton, London Gatwick, Madrid and Turin (the corresponding ranking for 2005 was London Gatwick, London Heathrow, Madrid and London Luton).

The five airport-pair routes with the highest average delay (minutes per movement) all involve either London Heathrow or Madrid Barajas, with the Heathrow Madrid pairing at the top of the ranking:

London Heathrow	Madrid	24.2
Chicago	London Heathrow	23.4
Madrid	London Heathrow	22.7
Barcelona	London Heathrow	20.9
Madrid	Milan Malpensa`	20.0

Figure 6-3: Average daily minutes, 2001-2006

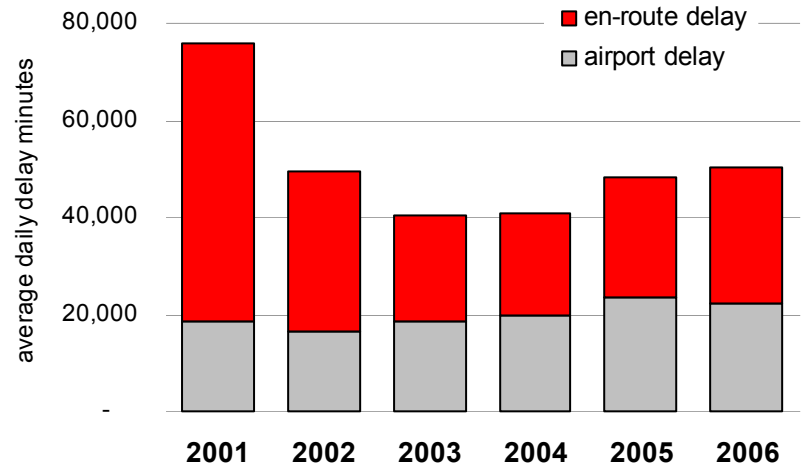


Source: Eurocontrol

AFTM delay can be expressed in terms of an en-route component, and an airport component. Figure 6-4 demonstrates that much of the post-2001 delay recovery has come from improvements in en-route delay. While the contribution of the airport-related element of delay has worsened by an average 3.7% per annum since 2001, en-route delays have improved by over thirteen percent per annum.

Not surprisingly, a large proportion of en-route delays were attributable to the operation of a relatively small number of en-route sectors. ATC capacity was the cause of 60% of en-route delays, with weather and ATC staffing the next two most frequent causes.

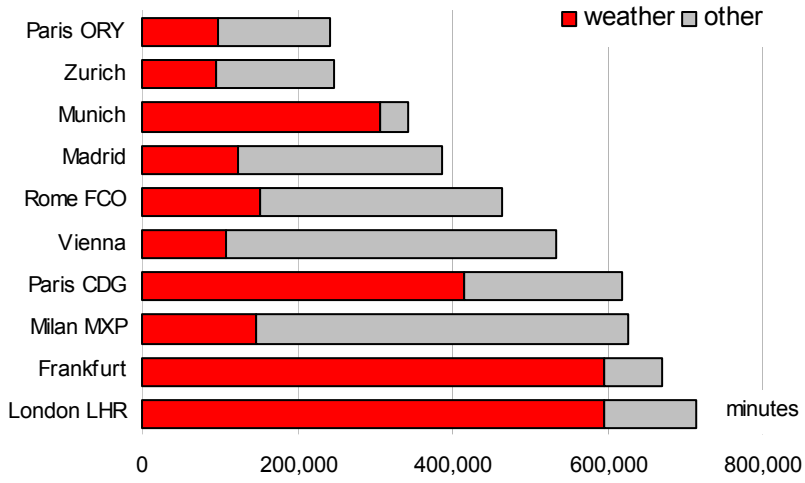
Figure 6-4: Constituent areas of average daily delay, 2001-2006



Source: Eurocontrol

The concentration of delay on only a small number of airports was even greater: just eight airports caused over half of airport related delays. Weather and airport capacity were the main causes of airport delay.

Figure 6-5: Delay minutes at airports most associated with delay, 2006



Source: Eurocontrol

Section 7

Air transport and the environment

7 Air transport and the environment

7.1 Aircraft noise developments

On the basis of recommendations made by the fifth meeting of the Committee on Aviation Environmental Protection (CAEP/5) in 2001, the Council of the International Civil Aviation Organization (ICAO) adopted a new Chapter 4 noise standard, more stringent than that contained in Chapter 3. Commencing 1 January 2006, the new standard applies to newly certificated aeroplanes and to Chapter 3 aeroplanes for which re-certification to Chapter 4 is requested.

A noise database (http://noisedb.stac.aviation-civile.gouv.fr/) was developed in 2006 by the French DGCA under the aegis of ICAO. The goal of this database is to provide certification noise levels for each aircraft type guaranteed by certification authorities. The application is intended as a general source of information for the public.

The Airbus A380 has received joint European Aviation Safety Agency (EASA) and Federal Aviation Administration (FAA) Type Certification on 12th December 2006. This was the first large European aircraft to obtain such approval from EASA. The aircraft meets the ICAO Stage 4 noise requirements by a comfortable margin, as well as complying with the stringent London Heathrow Airport QC2 departure and QC0.5 arrival noise limits.

Boeing and GE announced they expect to meet noise reduction targets for the B747-8, designed to meet London airports' quota count (QC2) target. The B747-8 is planned to give a reduction in noise levels of around 10 dB compared to the B747-400, putting it below ICAO Chapter 4 standards. It is expected to be 15% more fuel efficient than the B747-400. The first delivery will be to Cargolux in September 2009.

7.2 Climate change

7.2.1 EU ETS

An aviation working group set up by the EC to look into issues related to bringing the sector into the European Union Emissions Trading Scheme (EU ETS) reported their findings in April 2006. These were designed to contribute to the EC's general review of the EU ETS scheme which reported later in the year on inter alia extending the current scheme to other sectors. The Council of Ministers has already endorsed the EC's intention to include aviation in the EU ETS and the European Parliament adopted a resolution that proposed the application to air transport of a combination of measures: these supported the application of the emission trading system to the aviation sector so that airlines that exceed the limits of emissions would be able to buy emission credits from those who stay below their designated limits. Parliament also called for improvement of the air traffic management which can save fuel and reduce emissions. This would allow the airlines to shorten waiting times before departure and time spent in the sky before landing when the airport is congested. MEPs also urged the imposition of a tax on jet fuel used on domestic and intra-EU flights to ensure that other kinds of transport can compete fairly with aviation.

On 20th December 2006, the Commission adopted a proposal [COM(2006) 818 final] for legislation to include aviation in the EU ETS. This followed a Communication from the Commission in September outlining plans to reduce the impact of aviation on climate change. The proposal provides for aviation to be brought into the EU ETS in two steps. From the start of 2011, emissions from all domestic and international flights between EU airports will be covered. One year later, at the start of 2012, the scope will be expanded to cover

emissions from all international flights that arrive at or depart from an EU airport. The intention is for the EU ETS to serve as a model for other countries considering similar national or regional schemes, and to link these to the EU scheme over time. Therefore, the EU ETS can form the basis for wider, global action.

The proposed directive will go to the European Parliament and the Council of Ministers for discussion and adoption under the co-decision procedure. Meanwhile, the Commission and the EU Member States will continue to work with other countries through the UN Framework Convention on Climate Change and ICAO to pave the way for wider implementation of measures to reduce the climate change impact of aviation.

7.2.2 Other environmental studies

The issue of 'night' aircraft flights continues to make the news. In the past, the debate has been about aircraft operations at airports and a number of airports in Europe have, at present, a night-time ban on aircraft or the numbers of night-time aircraft movements are severely restricted.

The debate took a new twist with the presentation of the results of a recent study to look at the effects of aircraft condensation trails (contrails) at different times of the day and different seasons. The study by Reading University's meteorology department shows that although night flights account for only a quarter of movements over the United Kingdom, they generate at least 60% of the climate warming associated with contrails; the conclusion of the study being that aircraft flying at night can have a greater impact on the environment and that flights between December and February contribute half the annual mean climate warming, even though they account for less than a quarter of annual air traffic.

The study combined high-resolution aircraft flight data supplied by Eurocontrol with routine weather balloon data to model the interaction of solar and infrared radiation with the atmosphere. The study focused on contrails that remain for around an hour in an entrance region to the North Atlantic flight corridor site over Herstmonceaux in south-east England.

Nevertheless, European legislators continue to favour tightening current rules on marginally compliant aircraft, rather than banning night flights across the European Union, to control noise around airports, despite there being strong calls from a number of groups campaigning against aircraft noise to introduce an EU-wide ban on all night time flights. Such a ban would potentially lead to conflicts with Europe's partners in international aviation, impose unnecessary economic and social costs at those airports where there is no noise problem and unfairly export the problem to non-EU countries, as well as causing chaos to airline schedule planning for long-haul operations if such a ban were to be implemented on a world-wide basis.

The UK Parliamentary Environment Audit Committee published its report on aviation in August 2006 calling for government to raise taxes (VAT) on domestic flights and work with other governments to do the same to international flights within Europe. It acknowledged the significant potential benefits of including aviation within the EU ETS, but said that there remained very considerable uncertainties to be resolved before it could have confidence that such benefits would actually be realised. It suggested that the Air Passenger Duty should be raised to slow the growth of aviation and stabilise its absolute level of emissions, but noted that it was a "blunt instrument" that did not differentiate between the relative carbon-efficiency of different flights. Its response to this was that APD could be levied per flight, rather than per passenger.

There were also announcements of further studies being commissioned. In the UK, the government funded a study looking at the 'opportunities for meeting the environmental

challenges of the growth in aviation (Omega)' that will be undertaken by a number of universities (including Cranfield) together with industrial partners including Airbus, Rolls-Royce, British Airways and Manchester Airport.

At the Farnborough air show, a seven year programme to speed up the entry into service of 'greener' aircraft (Clean Sky) was signed up to initially by seven EU aerospace companies. The €1.6 billion programme is to be part funded by the EC under Research Framework 7. This will validate the future technology designed to meet long-term goals of cutting noise and reducing emissions set by ACARE.

Eurocontrol proposed the incorporation of environmental charges into its route charging system, as an interim measure while the introduction of an emissions trading scheme is pursued by the European Commission. This was included in its latest business plan, published in August 2006. One idea was to vary charges according to flight level, using three-dimensional navigation technology. This recognises the variation in environmental impact from aircraft emissions at different altitudes.

7.2.3 Environmental taxes

In October 2006, Sweden's newly-elected Government reversed plans by the country's previous administration to impose a new environmental tax on departing airline passengers. In July, Sweden had opted to introduce a SKr94 ($12.7) environmental tax for each departing passenger, instead of including the country in the European Union's emissions trading scheme. Ryanair had said that it would axe its Stockholm Vasteras-London Luton service and cut back other Swedish operations from 28 October if the tax had been introduced.

The UK has levied an Air Passenger Duty (APD) on air passengers since November 1994. APD is a duty of excise which is levied on the carriage, from a UK airport, of chargeable passengers on chargeable aircraft. It is sometimes described as an environmental tax, although it is not specifically structured to encourage environmental improvements (see 7.2.2 above). The revenue it raises (around £1 billion in 2006) goes towards general tax revenue rather than environmental projects.

There is a standard rate of £10 for passengers travelling to specific European destinations (broadly EEA states and EU accession countries) and £40 for all other destinations. The reduced rate that applies for travel in non-premium class cabins is £5 and £20 respectively. There are complicated rules on which rate applies to each passenger, for example those departing UK airports in economy class to transfer to a premium seat from a continental hub are charged APD at the highest rate. These rates were doubled in December 2006, with application from February 2007. Even those already having booked a flight that took place after that date were required to pay the higher rates. This doubling of the APD was estimated by IATA to add 4.4% to the average short-haul economy fare in Europe and 3.8% on long-haul journeys. IATA also estimated that it would result in a loss of £1.1 billion in airline revenues, reduce UK GDP in the long-run by £400m, with only £53m of annual climate change benefits (using the UK Treasury's assumptions of a 2.5 multiplier and carbon price of £70 per tonne).[15]

7.2.4 NOx emissions

Under the CAEP/4 standard, new aircraft engines must meet specified levels of NOx emissions, depending on their power output. Some engines have NOx emissions substantially below the CAEP/4 standard, and the London Heathrow emissions charges aim to encourage airlines to use lower emission engines. BAA Heathrow tracks the percentage of aircraft

[15] 'Impact of the rise in Air Passenger Duty', Economics Briefing, IATA, 7 December 2006.

movements with NOx emissions at least 20% below the CAEP/4 standard, as this reflects a stricter target for aircraft emissions than the CAEP/4 standard itself.

Table 7.1: Percentage of air traffic movements with NOx emissions at least 20% better than CAEP/4 standard

	2004/05	2005/06	2006/07
Heathrow	23.9%	22.7%	21.1%
Gatwick	27.0%	31.0%	31.6%

Source: BAA website, August 2007

Table 7.1 shows that the percentage of air traffic movements meeting or exceeding the requirements of CAEP/4 -20% decreased at Heathrow between 2004/05 and 2006/07 (years ended 31 March).

The Commission proposal[16] to include aviation in the EU Emission Trading Scheme foresees that emissions of nitrogen oxides will be addressed in other legislation to be presented by the Commission.

7.2.5 Local air quality

The EU Air Quality Framework Directive sets limits for certain pollutants, and airports are increasing the attention given to air quality in their immediate vicinity. One problem is to determine the source of various emissions, but a major contributor around airports is surface transport related both to air passengers and air cargo and the operation of the airport. Increasing use of public transport is a priority, notably at London Heathrow Airport, where permission for a third runway is linked to local air quality. Environmental factors also play a large role in Frankfurt Airport's application for another runway.

Table 7.2 Public transport use by passengers to/from BAA airports

	2002	2005	2006
Heathrow	34.4	36.9	35.2
Gatwick	30.4	32.3	34.8
Stansted	34.3	39.6	40.2
Total above	*33*	*36.3*	*36.7*
Glasgow	8.3	9.9	9.6
Edinburgh	3.3	19.5	22.6
Southampton	n/a	11.5	11.1

Source: BAA Corporate Responsibility Report, 2006/07

Table 7.2 shows that there has been some reduction at BAA's London airports in the use of private cars since 2002, with little change in the last year. Edinburgh has shown the largest improvement. Figures for Frankfurt Airport showed a similar share of public transport use to London Heathrow (36%) although this declined to 33% in 2006 (with around half of these using the ICE high-speed train).

Aéroports de Paris estimated that 90% of their employees at the Paris airports used private cars to get to and from work. To help reduce this level, they launched a car sharing initiative

[16] Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme forgreenhouse gas emission allowance trading within the Community (COM(2006) 818)

in 2006. The share of Frankfurt Airport employees using public transport was around 39% in 2005, and was thought not to have changed in 2006.

7.3 Airline fuel consumption trends

IATA reported fuel efficiency for members' system-wide services in 2006 improved by 2.2% from 40.3 litres per RTK in 2005 to 39.4 in 2006. The improvement in litres per ATK was 1.3% (from 25.9 to 25.6). The largest improvement came from the Africa region (6.6% better per RTK) following by Latin America (3.3% better). Airlines in these two regions were the least fuel efficient overall, and had the highest average age of aircraft. The efficiency of the airlines in the European region was a little down from 2005 in terms of litres per RTK.

The following summarises key trends in fuel use and emissions by the major European airlines in 2006. The fuel efficiency measures should be considered in the context of ICAO's CAEP voluntary goals. These were used by ICAO's forecasting group, with their base case assuming a 24 per cent improvement in fuel efficiency over the 12-year period from 1998-2010. The voluntary goals establish targets that beat the base case by between 0.5% and 1% a year over this period. This would increase fuel efficiency 30% and 36% over this forecast period (or between 2.2% and 2.6% a year).

Not all of the major European airlines achieved an improvement in average fuel efficiency in 2006 (Table 7.3), and only two were ahead of the goal illustrated above. British Airways and SAS both reported deteriorations, with Lufthansa scarcely changed from 2005. The former have both deferred decisions on any major fleet renewal programme.

Table 7.3: Fuel consumption for major EU airlines, 2006 vs. 2005

	Fuel consumption RTK/gallon		Average sector length in 2006 (km)	Average fleet age at end 2006 (years)
	2006	% change vs. 2005		
Air France-KLM	10.4	2.8	1,508	9.9
British Airways	9.3	-1.8	1,900	10.7
Lufthansa	8.4	-0.2	1,257	9.4
Iberia	9.2	6.9	1,320	7.9
SAS	5.8	-1.4	811	10.9
easyJet	8.3	2.1	1,011	2.2
Ryanair	9.5	4.4	981	n/a
Total/Average	**9.2**	**1.3**	**n/a**	**n/a**

Source: Airline annual and environmental reports

Iberia reported that the following factors played a major role in their efficiency increase in 2006:

- Lowering of their A340-300 cruise speed
- Optimisation of flight levels
- New policy of choosing alternate airports closest to the destination airport
- Change in contingency fuel policy
- 75% reduction in drinking water carried

The airline also withdrew its wet leased B747s in favour of more fuel efficient A340s and replaced some A320s with more fuel efficient A321s.

Table 7.4 looks at total fuel burn and emissions, as well as NOx emissions, with the sample's total traffic growth also shown. It can be seen that emissions growth was generally below

average traffic growth for the sample, with a major exception being the only LCC represented which was growing much faster than the other airlines.

Table 7.4 Change in tonnages of pollutants emitted*: major EU airlines, 2006 v 2005

% change	CO_2 emissions	NOx emissions
Air France-KLM	2.0	1.2
British Airways	3.1	1.5*
Lufthansa	2.8	2.6
Iberia	0.4	-5.1*
SAS	0.3	9.1
easyJet	11.5	n/a
Total/average emissions	2.6	n/a
Total RTKs	3.8	n/a

* only includes LTO emissions
Source: Airline annual and environmental reports

7.4 Air versus rail

A study by consultants Steer Davies and Gleave for the European Commission (DG TREN) published in August 2006 looked at the impact of environmental tax on the market shares of air and rail for London/Paris and seven other intra-EU sectors. They focused on CO_2 emissions, as these are the most significant, and concluded that the effects would depend critically on the level at which the tax was set: for example, if CO_2 emissions were charged at the current market rate in the EU Emissions Trading Scheme (ETS), for all modes, this would have almost no effect on market share. However if higher values were used, reflecting some assessments of the full economic cost of emissions, this could result in a shift from air to rail, although the change in market share would rarely exceed ten points, and on some routes the tax would barely offset the switch from rail to air that will result from the underlying projected reduction in air fares. A tax would also result in a reduction in the total size of the air plus rail market, which in some circumstances could have a more significant impact on emissions than the change in market share.

- Scenario 2.1: a CO_2 price of $20 per tonne, towards the middle of the range at which it has traded in the European Emissions Trading Scheme, using relative emissions levels from the CE Delft study but no multiplier effect on the emissions from aviation
- Scenario 2.2: a CO_2 price of $100 per tonne, equivalent to that used for some economic appraisals, using relative emissions levels from the CE Delft study but no multiplier effect on the emissions from aviation
- Scenario 2.3: as scenario 2.2 but with the value for air transport increased by a factor of 2.7 to allow for the impact of emissions being at higher altitudes
- Scenario 2.4: as scenario 2.3, but with the relative emissions levels from the TRENDS database
- Scenario 2.5: as scenario 2.3, but with the relative emissions levels from the TREMOVE model

Also in 2006, a study commissioned by Eurostar on the London/Paris route alone found that train journeys generate about ten times less CO_2 per passenger than flying (Table 7.5). Given the study's sponsor, a closer scrutiny of its assumptions would be recommended but alas these were not published.

Table 7.5 CO_2 emissions for selected routes: air vs. HST

Trip/Mode	kg CO_2 per passenger trip (return)	gCO_2 per passenger km
London-Paris (return)		
Short-haul air (average) Heathrow	122	168
Eurostar	10.9	11
London-Brussels (return)		
Short-haul air (average) Heathrow	160	219
Short-haul air (average) Gatwick	222	322
Eurostar	18.3	24.3

Source: Eurostar

Section 8

Safety and security

8 Safety and security

8.1 Accident statistics

8.1.1 World-wide

ICAO reports on worldwide safety and security statistics. The organisation recorded thirteen aircraft accidents involving 755 passenger fatalities on scheduled air services worldwide in 2006. The number of fatal accidents was down compared to 2005, but the number of fatalities was higher. However as traffic was up five percent in 2006 (measured in RPK), there was a very small increase in the rate of fatalities measured in deaths per one hundred million RPK, up from 0.0191 to 0.0193 in 2006.

Passenger fatalities relating to the performance of non-scheduled services were 81 in 2006, compared with 249 the previous year. The number of fatal accidents remained the same at thirteen in each year.

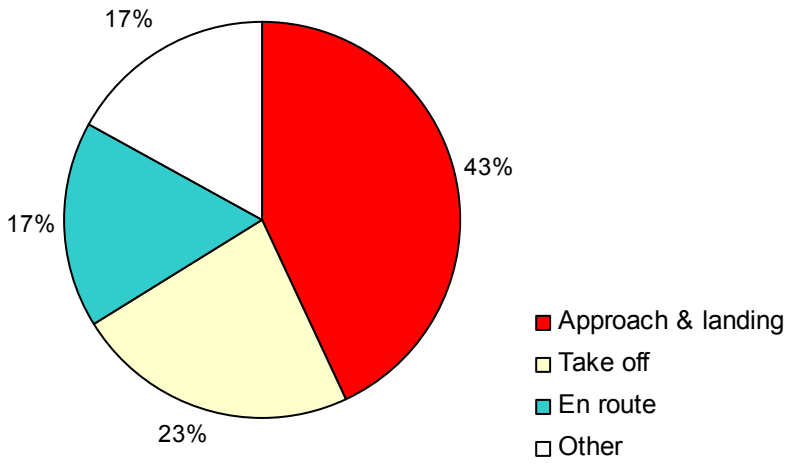
In terms of security, there were a total of sixteen acts of unlawful interference recorded. Two people died in these acts, and twenty-seven were injured.

8.1.2 European

The European Aviation Safety Agency (EASA) recorded six fatal accidents in Europe involving fixed-wing aircraft in public transport operations in 2006. There were five such accidents in 2005 and two in 2004. 146 people died in the 2006 accidents. This number of deaths is relatively high mainly due to a single accident in Russia (a French registered A310) in which 126 lives were lost.

Aggregating EASA data for the decade to 2006, it is clear that the majority of accidents happen in the final phase of a flight, during approach and landing. This is commonly observed in accidents world-wide.

Figure 8-1: Fatal accidents by phase of flight of public transport operations in Europe, 1997-2006



Source: EASA

During 2006, general aviation in Europe saw fifty-five fatal accidents resulting in 102 onboard deaths.

8.2 The blacklists and exclusions on safety grounds

Regulation (EC) 2111/2005 entered into force on 16 January 2006. The legislation reinforces the obligation on Member States to pass on safety-related information. Airline companies judged to be unsafe will be banned from flying and have the details of the ban promulgated through the internet and the Official Journal.

Regulation (EC) 474/2006 of 22 March 2006 established the first blacklist of airlines banned from operating within, to or from the EU. The list of unsafe airlines would be updated on a quarterly basis and published on the Commission's website. It was compiled on the basis of national contributions and after an in-depth analysis with Member State experts.

The first list consisted of ninety-two companies which faced a complete ban, and a further three companies which faced operational restrictions. From this point, the principle applied is that companies banned in one Member State are banned in the whole EU.

In December 2006 it was announced that Bulgaria would be initially excluded from joining the internal aviation market during its European Union accession in January 2007 after failing to sufficiently improve shortcomings identified in the oversight capabilities of its civil aviation administration. EASA considered there would be considerable risk that Bulgaria will not be able to ensure full compliance with EU rules on aviation safety.

8.3 Safety audits

8.3.1 IATA operational safety audit (IOSA) scheme

IATA linked membership of the organisation with its IOSA scheme, making completion of the audit a condition for its members. By the end of 2006 all IATA carriers should contract for an audit, to be completed before the end of the following year. Any new carrier wishing to join will first be required to complete an audit.

The IOSA programme was launched in 2003 to provide an industry standard for assessing operational management and control systems of airlines. Towards the end of 2005 IATA reported 40% of its members, representing 70% of IATA member traffic, had gone through the audit.

8.3.2 ICAO universal safety oversight audit programme (USOAP)

In March 2006, 153 of ICAO's 189 contracting states agreed that any state that does not agree to full transparency with regard to the results of the organisation's USOAP review should have the fact published on the ICAO website. At the same time countries willing to do so are encouraged to publish full details of the results of the review. Around one hundred states have agreed so to do.

8.4 Terrorism plot involving liquid explosives

8.4.1 Background

On 10 August 2006 British police arrested suspects allegedly involved in a plot to smuggle liquid explosives onboard aircraft making transatlantic flights. In the immediate aftermath of these arrests, all liquids (apart from baby milk and medicines) were forbidden from aircraft.

Following the arrests, the terror alert level was raised in Britain from 'severe' to 'critical', signalling an attack was believed to be imminent.

In the immediate aftermath of the raids, no hand luggage was allowed except for a very few essentials such as travel documents and wallets. Hand baggage restrictions were relaxed

somewhat from 15 August. The size of baggage was restricted and only one item cabin baggage per passenger was allowed.

Pressure on the security systems, particularly those involved in screening passengers, was intense. In the days following the initial alerts there were very significant delays and a number of flights were cancelled.

The estimated costs generated by the alerts and the subsequent security restrictions are high. British Airways had to cancel 1280 flights, at a cost in the region of £40 million, while EasyJet canceled 469 flights. The costs to airlines and airports in implementing and adapting to the security restrictions put in place following the alleged plot will represent a continuing financial burden to airlines and airports. There could also be longer term negative results on traffic to and from the UK, as air passengers switch to surface transport, in particular to the rail services offered by Eurostar.

8.4.2 EC initiative

The Commission adopted a Regulation (IP/06/1313) on 05 November 2006, restricting the liquids that passengers can carry airside and then onto aircraft.

The new regulation prevents passengers carrying liquids past screening points, whether on their persons or in their cabin baggage. It applies to all flights departing from airports in the European Union, regardless of their destination and the nationality of the carrier, so that there is the same level of protection throughout the European Union.

Passengers are permitted to take quantities of liquid in containers not exceeding 100 ml in capacity past screening points. These must be carried in transparent plastic bags of up to one litre in size. Exceptions are also made for medicines and dietary requirements needed during a trip, including baby food. Passengers can also continue to take liquids obtained airside, beyond the screening points.

Passengers are also required to remove coats and jackets at security checkpoints and take laptops and large electrical items out of their hand baggage for separate inspection.

8.5 The European strategic safety initiative (ESSI)

ESSI was launched in April 2006 with the objective of enhancing safety through analysis of safety data and the coordination of safety initiatives.

The three constituent safety teams supporting the work of ESSI are concerned with helicopter safety (EHEST), commercial aviation (ECAST) and general aviation (EGAST).

Section 9

Aircraft and manufacturers

9 Aircraft and manufacturers

9.1 Large airliners (over 120 seats)

2006 was another record breaking year for Boeing, but for Airbus it was a year of upheaval and this was partly reflected in a reduced order book. Boeing recorded 1,040 net orders while Airbus' lagged behind at 776.

Airbus's market share (in terms of net orders) dropped below 50% for the first time since 2002, to 43%, although, due to the American manufacturer's increased orders for wide-bodies (especially the 787) it is estimated that the market share by value was more like 38% to Airbus and 62% for Boeing.

The number of aircraft delivered by Airbus and Boeing in 2006 was 818. Airbus' total was 432 (up from 372 in 2005) while Boeing's was 386 (up from 285 the previous year).

Airbus

The A320 family again gained the major share (82%) of the European manufacturer's orders with some 639 net orders, following particularly the placement of large orders by operators in China, and India. In the wide-body market the A330 and A340 made up 115 net orders, while the A350 only gained 15 orders and the A380 picked up 7 new orders.

The A380's production problems continued to haunt the manufacturer partly due to wiring problems and it was forced to delay the aircraft's entry into service twice within the year finally putting it back to October 2007 – some 20 months later than originally planned. The fall-out from this, coupled with some additional announcements on production issues ultimately led to major management changes (including two changes of CEO) and may have hastened the decision by BAE Systems to sell its 20% stake to EADS.

The A350, which had come under public criticism from ILFC amongst others, was relaunched at the Farnborough Air Show in July as the A350XWB (Extra-Wide Body) in an attempt to compete more effectively with the 787.

Table 9.1: Airbus orders and deliveries, 2005 and 2006

			2006			2005	
Airbus	Deliveries	Orders	Changes	Net orders	Backlog	Net orders	Deliveries
A300	9	0	0	0	6	9	-30
A310	0	0	0	0	5	0	0
A318	8	4	-11	-7	54	9	36
A319	137	253	+5	258	567	142	209
A320	164	312	-40	272	1,067	121	564
A321	30	104	+26	130	278	17	103
A330	62	104	-1	103	227	56	54
A340-300	2	3	-1	2	5	4	0
A340-500/600	22	12	-2	10	56	20	12
A350	0	15	0	15	102	0	87
A380	0	17	-10	7	166	0	20
Airbus total	434	824	-34	790	2,533	378	1,055

The average value per ordered aircraft for Airbus in 2006 was just under $90 million - an increase of some 12% on 2005 figures, possibly due to the increase of A330/340 orders. The total value of deliveries of Airbus in 2006 was estimated as being $39.7 billion, around 21% up on the previous year.

Boeing

The Boeing 737NG family continued its popularity with a total of 725 net orders received in 2006, a 29% increase over 2005.

157 net orders were received for the 787; 76 for the 777; 72 for the 747 family (including 60 for the recently launched 747-8) and 10 for the 767, the latter being for freighter variants.

Boeing's 787 continued its development and major assemblies were in progress by year end.

Table 9.2: Boeing orders and deliveries, 2005 and 2006

	2006					2005	
Boeing	Deliveries	Orders	Changes	Net orders	Backlog	Net orders	Deliveries
717	5	0	0	0	0	13	-14
737	302	733	-4	729	1,560	212	569
747-400	14	12	0	12	42	13	25
747-8	0	60	0	60	78	0	18
757	0	0	0	0	0	2	0
767	12	8	+2	10	28	10	15
777	65	77	-1	76	299	40	154
787	0	160	-3	157	448	0	235
Boeing total	398	1,050	-6	1,044	2,455	290	1,002

The average value per aircraft ordered from Boeing in 2006 was $108 million, similar to the previous year and some 20% more than the respective value for Airbus (again illustrating the different mix of aircraft ordered). Meanwhile the total value of deliveries by Boeing in 2006 was estimated at $38.5 billion, an increase of 47% on the previous year.

9.2 Regional airliners

The market for regional airliners in 2006 saw orders for small regional jets continue to decline, larger regional jets increase and the continued steady resurgence of the turboprop.

ATR

The Franco-Italian turboprop manufacturer saw a reduction in its annual order book with the total for 2006 being 57 aircraft ordered, compared to 90 in 2005. Production of the ATR42 and 72 increased from 15 in 2005 to 24 in 2006.

Bombardier

The Canadian manufacturer saw net orders of 49 jets and 38 turboprops during the year an improvement over the previous year, although the totals mask different fortunes in the various product ranges. The smaller regional jets (below 80 seats) saw more cancellations than orders to the tune of a negative of 49 for the full year, this was somewhat compensated by 98 net orders for the larger CRJ900. On the turboprop side, the story was overall positive with the Q400 performing well with 24 net orders and the remaining 14 orders split between the smaller Q variants. In terms of overall deliveries for the year the total was 112 (64 jets and 38 turboprops),down from 153 the previous year, but still above Embraer's total. No firm decision on the C-Series was taken during the year.

Table 9.3: Turboprop orders and deliveries, 2005 and 2006

		2006			2005	
	Seats	Deliveries	Net orders	Backlog	Deliveries	Net orders
ATR						
ATR 42	48	8	3	11	5	17
ATR 72	68	16	56	113	10	73
ATR total		24	59	124	15	90
Bombardier						
Dash 8 Q200	37	1	3	4	1	2
Dash 8 Q300	50	16	11	15	9	10
Dash 8 Q400	74	31	24	57	18	49
Bombardier total		48	38	76	28	61
Grand total		**72**	**97**	**200**	**43**	**151**

Table 9.4: Regional jet orders and deliveries, 2005 and 2006

		2006			2005	
	Seats	Deliveries	Net orders	Backlog	Deliveries	Net orders
AvCraft						
328Je*	33	1	1	0	6	-6
Bombardier						
CRJ100/200	50	1	-16	0	35	-69
CRJ440	40	0	0	0	12	11
CRJ700-701	70	13	-33	5	49	43
CRJ700-705	75	0	0	0	15	0
CRJ900	86	50	98	71	14	14
Bombardier total		64	49	76	125	-1
Embraer						
ERJ-135	37	0	-15	0	2	0
ERJ-140	44	0	-20	0	0	0
ERJ-145	50	12	55	53	46	-7
170	70	32	-41	29	46	40
175	78	11	77	74	14	7
190	98	40	126	264	12	36
195	108	3	17	43	0	14
Embraer total		98	199	463	120	90
Grand total		**163**	**249**	**539**	**251**	**83**

Embraer

The decline of the small regional jet market was also held somewhat at Embraer where its ERJ145 picked up 55 net orders, though its smaller ERJ135/140 saw cancellations leading to a negative figure of 35 for the year. Its larger E Jet family members continued to perform well with a total of 220 net orders for the 175, 190 and 195, however its smaller 170 saw cancellations leading to a negative figure of 41. In terms of deliveries the total for the year of 98 compares to 120 for the previous year and reflects problems encountered with its production processes.

Abbreviations, Acronyms and Codes

Aviation Organisations

ACI	Airports Council International (formerly AACI)
AEA	Association of European Airlines
AFTN	Aeronautical Fixed Telecommunications Network
AOA	Airports Operators Association
ARINC	Aeronautical Radio Incorporated
BV	Bureau Veritas (France)
CAA	Civil Aviation Authority
CCA	Conference of City Airports
DOT	Department of Transportation (US)
ECAC	European Civil Aviation Conference
ERA	European Regional Airlines Association
FAA	Federal Aviation Administration (US)
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation (also known as OACI in French)
INMARSAT	International Maritime Satellite Organisation
JAA	Joint Aviation Authorities
LBA	Luftfahrt Bundesamt (Germany)
NATS	National Air Traffic Services (UK)
NTSB	National Transportation Safety Board
OAA	Orient Airlines Association
OAG	Official Airline Guide
RAI	Registro Aeronautico Italiano
RTCA	Radio Technical Commission for Aeronautics
SITA	Société Internationale de Télécommunications Aéronautique

Units of Measurement

ASK	Available Seat-Kilometre
ATK	Available Tonne-Kilometre
ATM	Air Transport Movement
FTK	Freight Tonne-Kilometre
LF	Load Factor
MTOW	Maximum Take-Off Weight
PAX	Passengers
RPK	Revenue Passenger-Kilometre
RTK	Revenue Tonne-Kilometre

Airports

ACI	Airports Council International (formerly AACI)
ATB	Automated Ticket and Boarding pass
BAA	former British Airports Authority
FIDS	Flight Information Display Systems

Country codes

Listed below are the thirty-two countries forming the core group for analysis in this report. They are defined by the twenty-five EU Member States, four accession and candidate states and three EFTA members.

code	country	code	country
AT	Austria	IE	Ireland
BE	Belgium	IS	Iceland
BG	Bulgaria	IT	Italy
CH	Switzerland	LT	Lithuania
CY	Cyprus	LU	Luxembourg
CZ	Czech Republic	LV	Latvia
DE	Germany	MT	Malta
DK	Denmark	NL	Netherlands
EE	Estonia	NO	Norway
ES	Spain	PL	Poland
FI	Finland	PT	Portugal
FR	France	RO	Romania
GB	United Kingdom	SE	Sweden
GR	Greece	SI	Slovenia
HR	Croatia	SK	Slovakia
HU	Hungary	TR	Turkey

Notwithstanding the definition of Europe in the previous paragraph, some sources of data used in this report employ quite different definitions. In the table below, countries represented as members states, contracting states or represented by airline members of international organisations are listed.

EU Member States	EU candidate states	EEA	EFTA		ACI Europe	AEA	ECAC	Euro-control	IATA Europe	ICAO Europe
				Albania	✓		✓	✓		✓
				Algeria						✓
				Andorra	✓					✓
				Armenia	✓		✓	✓		✓
✓		✓		Austria	✓	✓	✓	✓	✓	✓
				Azerbaijan	✓		✓			✓
				Belarus	✓					✓
✓		✓		Belgium	✓	✓	✓	✓	✓	✓
				Bosnia & Herzegovina	✓		✓	✓		✓
	✓			Bulgaria	✓		✓	✓	✓	✓
	✓			Croatia	✓	✓	✓	✓	✓	✓
✓		✓		Cyprus	✓	✓	✓	✓	✓	♦
✓		✓		Czech Republic	✓	✓	✓	✓	✓	✓
✓		✓		Denmark	✓	✓	✓	✓	✓	✓
✓		✓		Estonia	✓		✓		✓	✓
✓		✓		Finland	✓	✓	✓	✓	✓	✓
✓		✓		France	✓	✓	✓	✓	✓	✓
	✓			FYR Macedonia	✓		✓	✓		✓
	✓			Georgia	✓		✓			✓
✓		✓		Germany	✓	✓	✓	✓	✓	✓
✓		✓		Greece	✓	✓	✓	✓	✓	✓
✓		✓		Hungary	✓	✓	✓	✓	✓	✓
		✓	✓	Iceland	✓	✓	✓		✓	✓
✓		✓		Ireland	✓	✓	✓	✓	✓	✓
				Israel	✓				✓	
✓		✓		Italy	✓	✓	✓	✓	✓	✓
				Kazakhstan						✓
				Kyrgyzstan						✓
✓		✓		Latvia	✓		✓		✓	✓
		✓	✓	Liechtenstein	✓				✓	
✓		✓		Lithuania	✓		✓		✓	✓
✓		✓		Luxembourg	✓	✓	✓	✓	✓	✓
✓		✓		Malta	✓	✓	✓	✓	✓	✓
				Moldova	✓		✓	✓		✓
				Monaco	✓		✓	✓		✓
				Morocco						✓
✓		✓		Netherlands	✓	✓	✓	✓	✓	✓
		✓	✓	Norway	✓	✓	✓	✓	✓	✓
✓		✓		Poland	✓	✓	✓	✓	✓	✓
✓		✓		Portugal	✓	✓	✓	✓	✓	✓
	✓			Romania	✓	✓	✓	✓	✓	✓
				Russian Federation	✓				✓	✓
				San Marino	✓					✓
				Serbia & Montenegro	✓	✓	✓	✓	✓	✓
✓		✓		Slovakia	✓		✓	✓	✓	✓
✓		✓		Slovenia	✓	✓	✓	✓	✓	✓
✓		✓		Spain	✓	✓	✓	✓	✓	✓
✓		✓		Sweden	✓	✓	✓	✓	✓	✓
			✓	Switzerland	✓	✓	✓	✓	✓	✓
				Tajikistan						✓
				Tunisia						✓
	✓			Turkey	✓	✓	✓	✓	✓	✓
				Turkmenistan						✓
				Ukraine	✓		✓	✓		✓
✓				United Kingdom	✓	✓	✓	✓	✓	✓
				Uzbekistan						✓

♦ Cyprus is an ICAO contracting state, but represented through the Middle East (Cairo) office of ICAO

As the representative of Europe's major scheduled airlines, the Association on European Airlines (AEA) is used extensively as a data source for this report. The organisation's airline membership is given below.

Country	AEA airline member(s)		
Austria	Austrian		
Belgium	SN Brussels		
Croatia	Croatia Airlines		
Cyprus	Cyprus Airways		
Czech Republic	CSA Czech Airlines		
Denmark	SAS		
Finland	Finnair		
France	Air France		
Germany	Lufthansa		
Greece	Olympic Airlines		
Hungary	Malev Hungarian Airlines		
Iceland	Icelandair		
Ireland	Aer Lingus		
Italy	Alitalia		
Luxembourg	Luxair	Cargolux	
Malta	Air Malta		
Netherlands	KLM		
Norway	SAS		
Poland	LOT		
Portugal	TAP Portugal		
Romania	TAROM		
Serbia and Montenegro	JAT Airways		
Slovenia	Adria Airways		
Spain	Iberia		
Sweden	SAS		
Switzerland	Swiss International		
Turkey	Turkish Airlines		
United Kingdom	Virgin Atlantic	Brirish Airways	BMI

The European Regions Airline Association represents the interests of regional carriers and other organisations involved in air transport in Europe's regions. Its airline membership (2006) is shown below.

STATE	ERA Member Airlines			
Austria	Air Alps Aviation	Tyrolean Airways	Welcome Air	
Bulgaria	Hemus Air			
Switzerland	Darwin Airline	Flybaboo	Swiss International Air Lines	
Germany	Augsburg Airways	Avanti Air	Cirrus Airlines	Contact Air
	European Air Express	Eurowings	Hahn Air Lines	dauair
	Lufthansa CityLine			
Denmark	Cimber Air	Danish Air Transport		
Estonia	Aero Airlines			
Spain	Air Nostrum	Binter Canarias		
Finland	Blue1	Finncomm Airlines		
France	Brit Air	CCM Airlines	Régional	
Greece	Aegean Airlines	Euroair		
Croatia	Trade Air			
Ireland	Aer Arann	CityJet		
Iceland	Air Iceland			
Israel	Arkia Israeli Airlines			
Italy	Air Dolomiti	Alitalia Express	ClubAir	
Lithuania	Amber Air	Danu Oro Transportas		
Latvia	airBaltic			
Luxembourg	Luxair			
Montenegro	Montenegro Airlines			
Morocco	Regional Air Lines			
Netherlands	Denim Air	Interstate Airlines	KLM cityhopper	
Norway	Coast Air	Widerøe's Flyveselskap		
Palestine	Palestinian Airlines			
Poland	EuroLOT			
Portugal	ATA - Aerocondor	PGA - Portugalia	SATA Air Açores	
Romania	Carpatair			
Russia	Kogalymavia Airlines			
Sweden	City Airline	Falcon Air	Golden Air	Malmö Aviation
	Skyways Express	West Air Sweden		
Slovenia	Adria Airways			
UK	Air Atlantique	Air Southwest	Air Wales	Eastern Airways
Ukraine	Air Urga			

Definitions of Commonly Used Air Transport Terms

Aircraft hours are the total number of aircraft block hours in revenue service, block hours being calculated from the moment it moves under its own power for purpose of flight until it comes to rest at the next point of landing

Aircraft kilometres are the sum of products obtained by multiplying the number of flights performed on each flight stage by the stage distance

Aircraft utilisation is the average number of block hours that each aircraft is in use. This is generally measured on a daily or annual basis

Available seat kilometres (ASKs) are obtained by multiplying the number of seats available for sale on each flight stage by flight stage distance

Available tonne kilometres (ATKs) are obtained by multiplying the number of tonnes (2,204 lb) of capacity available for carriage of passengers and cargo on each sector of a flight by flight stage distance

Average aircraft capacity is obtained by dividing available tonne kilometres by aircraft kilometres flown (or available seat-kms by aircraft kms flown)

Average passenger haul is obtained by dividing revenue passenger kilometres flown by the number of passengers

Average stage length is obtained by dividing aircraft kilometres flown by number of aircraft departures for each airline; it is the weighted average of stage/sector lengths flown by an airline (normally the great circle distances)

Block time (hours) is the time for each flight stage or sector, measured from when the aircraft leaves the airport gate or stand (chocks off) to when it arrives on the gate or stand at the destination airport (chocks on)

Break-even load factor (%) is the load factor required to equate total traffic revenue with operating costs

Code sharing is the use of the designation code of one or more airlines on a flight operated by another airline

Co-ordinated airport is an airport where an independent co-ordinator has been appointed to facilitate the allocation of take-off and landing slots (times) to airlines at congested airports in Europe

Flying time (hours) is the time for each flight stage or sector, measured from when the aircraft leaves the ground or lifts off to when it touches down on the runway on arrival at the destination airport

Freight tonne kilometres (FTKs) are obtained by multiplying the number of tonnes of capacity carried (passengers and cargo) on each sector of a flight, by flight stage distance

Grandfather rights is the convention by which airlines retain the right to take-off and landing slot times at an airport as long as they are used (also used in conjunction with route rights)

Interlining is the acceptance by one airline of travel documents issued by another airline for carriage on the services of the first airline, according to conditions laid down in an interline agreement (which include the allocation of revenues between the two carriers); an interline passenger is one using a through fare for a journey involving two or more separate flights and two or more carriers

Operating costs per ATK is a measure obtained by dividing total operating costs by ATKs. It includes flight operating expenses, sales ticketing and promotional costs, ground operations costs and general and administration costs. It usually excludes interest payments, but includes aircraft lease rentals

Operating ratio (%) is the operating revenue expressed as a percentage of operating costs

Passengers carried are obtained by counting each passenger on a particular flight (with one flight number) once only and not repeatedly on each individual stage of that flight (or one ticket coupon equals one passenger), with a single exception that a passenger flying on both the international and domestic stages of the same flight should be counted as both a domestic and an international passenger

Passenger load factor (%) is passenger-kilometres expressed as a percentage of available seat kilometres (on a single sector, this is simplified to the number of passengers carried as a % seats available for sale)

Punctuality is measured as the percentage of flights departing within 15 minutes of schedule, according to the most widely used airline industry standard

Revenue passenger refers to passengers paying 25% or more of the normal applicable fare (for ICAO statistical purposes)

Revenue passenger kilometres (RPKs) are obtained by multiplying the number of fare paying passengers on each flight stage by flight stage distance

Revenue tonne kilometres (RTKs) are obtained by multiplying the total number of tonnes of passengers and cargo carried on each flight stage by flight stage distance. Passengers tonne kilometres are normally calculated on a standard basis of 90 kg average weight, including free and excess baggage**,** although this has been increased recently by some airlines (eg British Airways have recently increased the average passenger weight from 75kg to 80kg, as a result of a CAA directive, to which the 20 kg free baggage allowance should be added)

Seat factor or passenger load factor on a single sector is obtained by expressing the passengers carried as a % of the seats available for sale; on a network of routes it is obtained by expressing the total passenger-kms as a % of the total seat-kms available

Seat pitch is the standard way of measuring seat density on an aircraft. It is the distance between the back of one seat and the same point on the back of the seat in front

Scheduled freight yields are obtained by dividing total revenue from scheduled freight by RTK from freight

Scheduled passenger yields are obtained by dividing the total scheduled passenger revenue by RTK from passengers

Scheduled services are services provided by flights scheduled and performed for remuneration according to a published timetable, or so regular or frequent as to constitute a recognisably systematic series, which are open to direct booking by members of the public; also extra revenue flights occasioned by overflow traffic from scheduled flights; and preliminary revenue flights on planned new air services

Slot at an airport is the right to operate one take-off or landing at that airport within a fixed time period. In practice, the slot timings are only nominal and flights often take-off and land at times outside their specified slot period, although airlines must possess the nominal slots to operate air services. Slots are traded between airlines legally in the US, and unofficially in other parts of the world (where only the exchange of slots is officially permitted)

Unduplicated route kilometres are the lengths in kilometres of all the flight stages operated by the airline, each counted only once, and regardless of frequency or direction

Unit costs are obtained by dividing total operating costs by ATKs

Weight load factor is revenue tonne kilometres performed expressed as percentage of available tonne kilometres (also called overall load factor)

Yields are obtained by dividing the total operating revenue by RTKs (or sometimes by ATK); passenger yields are obtained by dividing passenger revenues by RPKs, and cargo yields by dividing cargo revenues by FTKs. Revenues have historically been recorded before the deduction of travel agent commissions, giving gross rather than yields net of commissions