International Center for Competitiveness Studies in the Aviation Industry

Fact Book 2008

Air Transport in Europe

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FACT BOOK – AIR TRANSPORT IN EUROPE

Executive Summary

ICCSAI´s annual *Fact Book* is a bianually updated and synthetic reference document on competition in the air transport industry of Europe. Special attention is given to the Italian context, although these data are discussed from an international perspective.

This work is addressed to all players in the air transport industry. It presents detailed information on demand, supply, industry structure, and regulation policies. Moreover, we draw broad conclusions from these data and identify key questions for future research.

We endeavor to approach topics debated in the literature from the standpoint of those who work in the air transport industry as operators or policy makers.

For all readers interested in this domain, the *Fact Book* aims to be not just a reference but a starting point for further reflection. We are keenly aware that even the most exhaustive data collections and best-informed analyses often do not provide simple, clear-cut solutions to the multifarious problems encountered daily by managers and policy-makers. However, we are also convinced that even imperfect data analysis can help by averting those judgments and decisions that stand in glaring contrast with its results.

The 2008 *Fact Book* captures a period of particular dynamism at the international level. Operators are progressively adapting to larger regions of competition (particularly with reference to the *Open Skies* agreement between the EU and the USA, in force since April 2008) and the intensification of concentration processes between carriers.

In fact, opening routes between Europe and the United States to competition will have a profound impact on competitive settlements throughout the industry. On the one hand, *Open Skies* will create a context of growing demand and falling prices, thereby accentuating the concentration tendency among carriers. On the other hand, it is also bringing international fares to the attention of policy-makers. The same thing happened in the past, when intra-EU flights were first opened to competition.

Among recent episodes of consolidation, the acquisition of Northwest by Delta appears particularly significant. This merger of USA carriers will create the biggest airline in the world, with approximately 800 airplanes, 75,000 employees and almost 130 million passengers per year. Several other aggregations of similar scope are currently in the planning phase. Some of these are of strategic nature: Lufthansa's investment in the American carrier Jetblue, for example, anticipates the second phase of *Open Skies* planned for 2010.

Furthermore, the three great world alliances are consolidating their

status. *Skyteam, Star* and *Oneworld* are all trying to bring in new members, particularly carriers operating in Asian markets.

Another emerging trend involves airports, especially those serving as a hub and subject to major congestion. The opening of Terminal 5 at London Heathrow is one answer to this type of inefficiency. The infrastructure investments required to deal with congestion will certainly have an effect on fares.

At the same time, the traditional role of hubs is being called into question as ongoing consolidation changes the face of the industry.

The Italian context is characterized by several changes, some connected to a crisis of its flag carrier, and some to the industry's evolving regulatory process (especially where airports are concerned).

Reorganization of Alitalia led to widespread repositioning of Italy's air transport offers, a process which has continued since April 2008 (traffic has grown more concentrated on Rome Fiumicino). The market shares of the main Italian airports (Rome Fiumicino and Milan Malpensa) have been both affected. If the trend of open skies continues, on the other hand, national and international carriers using the Milan airport could acquire *slots* left free by Alitalia. (Some countries still have bilateral agreements limiting the offer, which could be dissolved in the future.)

Such circumstances represent an important opportunity for continued development of Italy, even if the present situation is objectively difficult.

With respect to regulation, Italy's new method of determining airport charges based upon greater transparency has not yet been adopted. The policy was designed to reward airport with adequate investment strategies and make certain efficiency improvements.

The basic features of Italy's new regulatory process were established by CIPE (*Commitato Interministeriale Programmazione Economica*, or "Treasury Department Public Budget Commitee") in directive no. 38 of June 15th 2007, and by ENAC (*Ente Nazionale Aviazione Civile*, or "National Civil Aviation Agency") in guidelines delivered on February 14th 2008. Its key requirements are the adoption of a transparent and analytical accounting method (including strict guidelines on how to calculate capital cost), a price cap mechanism to set fare dynamics, and a mixed single-till system. This last point refers to the role played by non aeronautical revenues in subsidy lower aeronautical fares

The regulations will go into effect when agreed upon by every Italian commercial airport. By providing a context of certainty for all concerned players, as well as guaranteeing a high degree of freedom, the directive and its accompanying guidelines should foster development of the air transport industry. It is to be hoped that "accordi di programma" will be carried forward swiftly, as its absence has adversely affected investment policies and efficiency controls in recent years. The new directive

supplants a previous version (no. 86 of August 4th 2000), which was never formally applied.

The special contribution in this *Fact Book*, by Dr. Romano Pagliari, explores the relationship between airport economic regulation and capital investment incentives with specific reference to the United Kingdom experience. While in Italy the price cap regulation is struggling to go into effect , the UK Civil Aviation Authority (CAA) recommended that price-cap regulation, with regard to some UK airports, is replaced by a more light-handed approach.

The data presented in this *Fact Book* relate to several aspects of the air transport industry in 28 European countries: the 25 members of the European Union plus Norway, Iceland and Switzerland.

This *Fact Book* analyzes in detail several specific features of the air transport industry: passenger and freight traffic in Europe and Italy (chapter 1), statistics on traffic through the main European and Italian airports (chapter 2), the structural characteristics and connectivity of airports in the European network (chapter 3), the levels of direct and indirect competition between airports and carriers on various routes (chapter 4), the most important carriers´ market performance and operation characteristics (chapter 5), and the pricing policies of low-cost carriers (chapter 6). A methodological appendix completes the report.

The European market for air transport grew by 6.4% in 2007. This is the fourth consecutive year that growth rates have been above 6% (see figure 1). The United Kingdom remains the top European market in terms of passengers carried, with a share of 18.7% (see figure 2).

Italy is the fifth largest European market, with 136 million passengers (very close to France's 139 million). Over the past five years, the Italian market has experienced an average annual growth rate (8.2%) much higher than France's rate of 3.6% (see table 1).

For the second consecutive year, Spain and Italy have registered the highest growth rates in terms of the number of passengers carried. Together they generated 39% of the total growth experienced by all 28 countries in our sample.

Italy surpasses all other countries in the sample with respect to the ratio between growth rates in passenger traffic and GDP over the past five years (figure 3). Where the European average is 2.7, for Italy this ratio (passenger growth / GDP growth) is about 8. This statistic illustrates the impressive growth capacity and development opportunities of the Italian air transport market.

The Italian "propensity to fly" index remains in line with the European average, but well below those of the United Kingdom, Spain and Germany. This is especially true with respect to intercontinental flights (figures 4 and 5). This could be due to a stronger dynamic in the domestic and intra-European segments of the Italian market and/or to the absence of airlines capable of developing

adequate intercontinental routes. If the latter factor is dominant, then some of the Italian market is likely to be "caught" by other European airlines through feeder flights to non-domestic hubs.

Among the eight European countries with more than ten major airports, we observe a trend towards reduced air traffic concentration throughout 2007 (table 3). This trend is not apparent in the Scandinavian countries, whose high concentration can be explained by unique geographical and territorial constraints. The other exception is France (figure 8), whose top airport accounts for more than 40% of total traffic and exhibits a trend towards increased concentration.

There seems to be a negative correlation between growth rate and the current value of the concentration index (figure 9): air transportation activity has grown less in those countries with high traffic concentrations. The same relationship appears to hold for traffic concentration dynamics (i.e., the mean annual change in concentration): the highest growth rates are associated with the least concentrated countries and a trend of further de-concentration. If we take low or decreasing concentrations as evidence of competition, one might conclude that competition has spurred growth. On the other hand, if the growth is concentrated on just a few airports congestion may follow.

In the field of freight transport, Italy registered the highest growth rate (slightly below 6%) among the main European countries in 2007 (figure 7). This rate is in line with passenger traffic growth (figure 11). Italy is only half as representative in freight transport as it is in passenger traffic, however; its market shares in the two categories are 6% and 10% respectively. Germany, on the other hand, confirms its position as the continent's freight hub with a 22% share of all tonnage forwarded to European countries.

Freight traffic remains highly concentrated on just a few airports per country. This is especially true in France and Germany, but the tendency is confirmed in Italy as well. Unlike passenger traffic, we find a positive correlation between growth and concentration (figure 15).

The second chapter of the *Fact Book* deals with airports. Trends of the past five years have not yet upset the role of the biggest airports. London Heathrow remains the number one EU airport in terms of passenger volume, even if the gap between ranks 1 and 2 has significantly narrowed (see table 8). In the period 2002-2007 Paris achieved second place, surpassing Frankfurt which now ranks 3rd. The growth of Paris Charles de Gaulle is related to France's process of increasing concentration.

Airports with a prevalence of low-cost carriers are becoming more and more important. London Stansted rose from 17th to 12th, while Dublin rose from 18th to 14th.

Amongst Italian airports, Fiumicino dropped one place (in favor of Munich) while Malpensa climbed from rank 15 to rank 11. Malpensa carried almost 24 million passengers in 2007. Italy also has three airports

(Fiumicino, Malpensa and Orio al Serio) among the top 20 in terms of absolute growth over the five-year period. (Furthermore, Rome Ciampino is the 21st.)

Brussels and Zurich are amongst those airports with the greatest traffic losses over the past five years (even if they currently seem to be recovering a bit). This reflects the fact that both countries suffered a flag carrier crisis. Their experiences could be particularly instructive when considering Malpensa´s prospects for development in the wake of Alitalia´s strategy change.

Due to the growth of passenger traffic, in 2007 Europe had 10 airports handling more than 25 million passengers and 62 airports handling more than 5 million passengers (figure 16). In 2000, these figures were 8 and 46. Within individual size categories, we see that the booming growth rates of small and medium-sized airports have slowed down while the big airports are recovering (figure 17). The system remains highly polarized: almost 80% of total traffic is handled by the top 20% of all airports.

Among the top 20 airports in freight traffic, the big hubs held their position while new airports such as Brussels and Cologne/Bonn entered the list. (This can be taken as evidence of a precise strategy of their part.) Malpensa remains the only Italian airport among the top 10 (table 16). In contrast with trends in passenger traffic, the already high concentration of freight traffic has grown even more during the past five years. Twenty percent of all airports handled approximately 95% of all freight traffic (figure 28).

In Italy, both passenger and freight traffic remain geographically concentrated. In 2007, 46% of passenger traffic and 76% of freight traffic were concentrated in the northern Italian airports (figure 29).

Chapters 3 and 4 of the *Fact Book* focus on peculiarities of the European route network, mainly from the perspective of connectivity levels and the accessibility of single airports. We also undertake an analysis of routes and related competition.

Both European and worldwide network characteristics were analyzed by calculating a *connectivity index* for each airport (see the methodological appendix for more details), which essentially measures the average number of steps required to reach any other airport in the network. Table 29 shows the top 30 airports in terms of worldwide connectivity, comparing the rankings of 2007 and 2006. The world network used in this analysis contains 3,523 airports. It is reassuring to see that the four most connected airports are all European: Frankfurt, Paris, Amsterdam and London (Heathrow).

The top two Italian airports (Fiumicino and Malpensa) occupy ranks 16 and 17 respectively, with connectivity indices of 2.75 and 2.76. Both moved up in the ranking since 2006, by 4 and 8 places respectively. The 3rd most highly connected Italian airport is Venice, 101st in the worldwide ranking. It is trailed by Bologna, Milan Linate and Catania.

Turning to European connectivity in a sample of 479 airports, Amsterdam and Dublin occupy the first and second places respectively in 2007 (table 30). Fiumicino was stable at rank 16, while Malpensa moved up 7 ranks from 30th to 23rd (compared to 2006).

The European airports were also ranked according to their ability to reach significant shares of GDP and population with a direct flight. The top 20 airports all connect directly to over 84% of the market by both measures. These airports are gateway "connection enablers" (tables 34 and 35). Italy's only representative in this ranking is Rome Fiumicino.

If we consider the European GDP share reachable in less than two hours of flight time, we find that Italian airports divide easily into two categories (table 44). A total of seven airports reach more than 50% of the market, all located in northern Italy, while the remainder fall well below this threshold.

This year's *Fact Book* includes a new quantitative measure of airport importance: the airport's role as an essential intermediate node for reaching other destinations within Europe. This quality of "essential betweenness" reflects the airport's potential to serve its territory as a "*de facto* hub". Table 37 ranks the Italian airports according to this index. Venice, Pisa, Naples and Bergamo all seem to play significant roles alongside the "natural" leaders Fiumicino and Malpensa.

In terms of average travel times, Malpensa seems to be the Italian airport "closest" to the rest of Europe. It is ranked 14th in Europe (table 38).

The European airports were also analyzed in terms of various passenger traffic measures: the number of routes, ASK (Available Seat Kilometers), and the total number of offered seats. Our analysis shows that slightly more than 25% of all offered seats lie on extra-European routes. Obviously, given the longer distances associated with intercontinental flights, the fraction of ASK offered is even greater--double that associated with the intra-EU market (66%).

The two major Italian airports, Fiumicino and Malpensa, rank 8th and 9th in Europe in terms of total ASK (see table 24).

While Paris CDG and Frankfurt are catching up to London Heathrow in terms of ASK offered, this measure also confirms Heathrow's role as a hub for intercontinental flights (especially to the United States). Its supremacy could come under attack due to the *Open Skies* agreement between Europe and the United States, which took force in 2008.

Among the top 20 European airports in ASK, 3 are German, 3 English, 2 French, 2 Spanish and 2 Italian. An analysis of these airports shows that the number of non-domestic flights increases with route length. At the same time, the number of offered seats decreases with route length.

On the whole, as shown in figure 36, approximately 80% of all European routes are shorter than 1,500 km. Only 5% are longer than 3,000 km.

The airports offering European routes with the highest (average) weekly frequency are London Heathrow, Madrid Barajas and Paris Charles de Gaulle (see table 49). The specific routes with the highest weekly frequency are those connecting Madrid Barajas to Barcelona (275 flights) and Rome Fiumicino to Milan Linate (299 flights).

The most important route in terms of both offered seats and ASK is that connecting Barcelona to Madrid Barajas. It is followed by the routes connecting Rome Fiumicino to Milan Linate and Paris Orly to Toulouse Blagnac. All the most important non-domestic routes (in terms of offered seats) include Europe's biggest hub, London Heathrow. The connections from Heathrow to Amsterdam, Dublin, Paris Charles de Gaulle and Frankfurt occupy ranks 4, 6, 7 and 8 respectively. These routes also play a major role in terms of ASK, with the London-Frankfurt connection ranking 1st among non-domestic routes. Furthermore, it is worth noticing that none of the top 20 routes include a non-domestic connection to or from Italy.

The development of low-cost carriers is modifying the competitive situation, which is more and more characterized by competition among alternative routes. With respect to single (normally defined as "direct") connections between two airports, traffic is most concentrated (i.e., has the weakest direct competition), on the Vienna, Zurich, Milan Malpensa and Paris Charles de Gaulle airports (table 57).

In particular, 55.2% of ASK from Paris Charles de Gaulle is offered by Air France. We also find high airline concentration indexes in Vienna (Austrian Airlines), Zurich (Swiss), Milan Malpensa (Alitalia), Munich and Frankfurt (Lufthansa), and Copenhagen (SAS). Rome Fiumicino is somewhat peculiar in this regard, as its first carrier (Alitalia) has a relatively low share of ASK (27.9%). Among flag carriers at their own main airports, this is the lowest figure in Europe. Even the top five carriers at Fiumicino, however, cover only 45.5% of its ASK (table 59).

In the same chapter we also consider the level of "indirect competition" between airports (and between carriers). An airport's exposure to indirect competition can be defined as the proportion of its ASK volume associated with alternative yet similar routes. (Meaning that the same point-to-point connection is offered by other airports "sufficiently close" to the route's departure and arrival airports.) For example, the top two Italian routes (Rome Fiumicino – Milan Linate and Rome Fiumicino – London Heathrow) are subject to competition from 4 and 5 alternatives respectively. This is a clear signal of the Italian market's high accessibility and good competition level.

Chapter 5 presents traffic statistics for the major European carriers (table 66). Lufthansa carries the most passengers, while Air France leads in RPK (*Revenue Passenger Kilometers*). If we combine KLM and Air France traffic data, the French-Dutch group clearly stands out as the foremost European carrier with approximately 74 million passengers and 203 billion annual RPK.

In addition to better positioning on intercontinental markets, the great size of Air France–KLM affords several competitive advantages on the intra-European market. By consolidating their growth, low-cost competitors have attained passenger traffic numbers comparable to those of the biggest traditional carriers. Among the top 6 European carriers in passenger traffic we find three low-cost carriers: Ryanair (3rd, with 49 million passengers), easyJet (4th, with 38 million passengers) and Air Berlin (6th, with 28 million passengers).

Since 2002, the number of passengers carried by these three carriers has increased by 85 million. This figure is a significant portion of the intra-European market's total growth. Among flag carriers, Air France–KLM and Lufthansa together achieved almost identical passenger traffic growth (table 68), albeit with different expansion strategies.

Compounded annual growth rates in the period 2002–2007 are dominated by low-cost carriers, central European carriers, and regional network carriers. The latter have generally been repositioned within the hub-and-spoke strategy by their respective flag carriers (table 68).

Although passengers are highly concentrated on the top carriers, European traffic has not yet reached the level of concentration found in the USA market (figure 38). Considering the greater maturity of that market, this state of affairs suggests further integration of European carriers in the future. This trend is likely to be encouraged by slower growth in 2008. (Dramatic increases in fuel prices will induce greater economies of scope and scale.) Furthermore, the second phase of the *Open Skies* agreement should soon open up the property market to carriers in both continents.

Regarding competition in Europe, it is noteworthy that 884 of Ryanair´s 970 routes have no direct competition (table 83). The remaining 86 routes generate a little more than 10% of the carrier's total traffic in terms of ASK. For Ryanair the average number of competitors per offered route is 0.11; the year before, it was 0.10. Air Berlin's situation is completely different. The 2nd ranked European carrier in terms of served routes, 77% of its ASK volume is subject to direct competition and the average number of competitors per route is 1.45 (compared to 1.19 the year before).

Among traditional carriers, Alitalia has the greatest number of competitors per route, at 1.64. Almost 89% of its ASK are subject to competition. Also, competition has increased for Alitalia since the previous year. This fact makes the carrier's structural weakness even more evident.

The carrier with the highest share of traffic volume subject to competition is HapagFly (part of TUIFly since April 2007), at 100%. This carrier also has the highest number of competitors per route: an average of 3, compared to 1.8 in the previous year.

The outlook changes if one considers indirect competition. While it has little direct competition for routes, Ryanair shares fully 60% of its ASK with other carriers via similar routes (table 84). The carriers least subject to indirect competition are Spanair, Iberia and

SAS. Among traditional carriers, it is British Airways that competes with the highest number of alternatives per offered route (approximately 2.48). This fact can be attributed to the high density of airports in the London area.

The fare strategies of low-cost carriers are assessed in chapter 6. This type of carrier usually relies on the Internet for reservations and ticket sales, which allows them to adopt a dynamic pricing strategy. There are two kinds of price discrimination to consider: 1) discrimination due to the proliferation of fares and 2) temporal discrimination. In the first case we find different fares for different types of passengers. In the second case all passenger types are offered the same fare at any given time prior to departure, but the fares may vary significantly over time.

Almost all low-cost carriers base their pricing policy on the latter strategy. Thus, in order to determine their actual policies, we have to monitor the fares offered on single flights during various pre-booking periods. We analyze an extensive database of fares announced on the Internet by the main low-cost carriers: Ryanair, easyJet, Myair and Windjet. If not otherwise specified, all fares are for European routes in the year 2007. Fares for Windjet were monitored since April 2007.

The reported values are full prices charged to the *final* customer, including all taxes. Given the various fare compositions, base prices and supplements published by the carriers, it was impossible to find uniform criteria for comparing their base fares.

With a few exceptions, the dynamic pricing phenomenon is evident on the main European routes served by low-cost carriers. Fares offered during the week before departure averaged 1.5 to 2 times more than those advertised for the same flight two months before departure. The fares themselves vary substantially among routes, even after normalizing for length.

Ryanair and easyJet have an especially striking tendency toward dynamic pricing, while Windjet´s fares vary much less as the day of departure nears (figure 49).

The least expensive routes in Europe are those served by Ryanair, which offers fares between 20 and 40 Euros for some routes with advance booking (see table 94). No other low-cost carrier has attained a place among the 20 least expensive routes. Among the 20 cheapest routes in Europe, 4 involve an Italian airport: Genoa to Frankfurt Hahn, Trieste to Frankfurt Hahn, Orio al Serio to Bristol, and Orio al Serio to Bremen.

The least expensive route in Europe is Shannon–Dublin (an Irish domestic flight of only 200 km), with an average fare ranging between 21 and 25 Euros.

Almost all of the 20 least expensive routes to or from Italy (table 95) are operated by Ryanair. The connections from Orio al Serio to Luxembourg and from Palermo to Venice are exceptions, both operated by Myair.

The average fares are also sensitive to the time of day and the day of the week. On monitored routes, the average fare peaks in three departure

time ranges (figure 45): 11-12 a.m., 4-5 p.m. and 10-11 p.m. The lowest average fares were observed for 8-9 a.m. and 10-11 p.m. departures.

The day of departure also systematically influences the fare (figure 46). Weekend and Monday fares are obviously well above those charged on other days.

With the exception of very short distances (<500 km), where fares are influenced by shortage phenomenons, we do not find significant pricing differences between routes with and without indirect competition (figures 51 and 52).

Finally, while many of the findings in this Fact Book might be worthy of further attention and research, some provisional yet hopefully important conclusions may be drawn from the results summarized above.

Firstly, **airport regulation policies** should pay close attention to the promotion of adequate infrastructure investment. This must include developments devoted to increasing accessibility. In spite of Malpensa´s high connectivity ranking (now partly impaired by Alitalia´s choice to abandon the airport), its accessibility is rather low in comparison with other European hubs.

Given the present competitive environment, fares not in line with European standards are not sustainable in the long run. We run the risk of prolonged underinvestment and diminishing service quality in major airports, including those which have only recently managed to achieve high connectivity (at least on the European level). In this respect, the new CIPE directive represents an opportunity for Italy to improve its position in the future.

Regulation policies need to take into account some features peculiar to the Italian market and its airports (high demand, historical underinvestment). In the near term, regulation should help the system evolve towards levels of service comparable with European standards. A simpler and more flexible system is suggested by the British experience, which is now in its fifth regulation period (2008-2013). Ideally, Italy's new regulaltions will pragmatic promote the development of the whole air transport industry, as well as individual airports.

Furthermore, while reorganizing the airport system one cannot forget that competition occurs not just between carriers but also airports. If it is true that competition between carriers can *induce* competition between airports, then it should be desirable to create an environment where airports can adopt their own growth strategies (at least in countries lacking a strong reference carrier). This is possible only in a context of certainty. Legislators and regulators should look to coordination between airport structures as a means of guaranteeing the quality of investment and customer service, rather than trying to steer a course through the turbulence generated by markets in liberalization.

Britain has already recognized the importance of this problem. In a study of structure in the national airport market begun in 2006 (an intermediate report came out in April

2008), the British antitrust authority acknowledged that significant competition exists between airports in some regions.

Secondly, we conclude that **ownership structure** is a crucial factor linked to the size of industry players. The economic literature often stresses the relationship between ownership structure and corporate strategy. Public ownership has often shown its limits in promoting the growth rates necessary for this industry. While most major carriers are privately owned most companies operating airports are public. Evolution in the ownership structure of the latter should be considered with special attention.

Many seaport operations in Italy are now controlled by foreign operators. This experience indicates a potential development path for airport operations, but it would be surely better if such a takeover were intentionally fostered. Italy would be disadvantaged if the processes behind the change were merely due to weaknesses of our national system.

Otherwise, aggregation in a public shareholder context has no lack of positive examples: the energy industry and other utilities, for instance. Nevertheless, past have cases involved more robust regulations and relied on the absence of weak players who might affect reorganization policies.

Finally, a particularly strong point of this year's *Fact Book* is **the central role of competition and pricing issues**. Constant and detailed monitoring of competition levels and their impact on consumer prices is highly desirable.

Integration between carriers, rising fuel costs, and growing attention to ecological questions can all strongly affect the final price of air transport services. Thus, strict monitoring of the conditions under which European and Italian citizens fly also appears to be needed.

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