

DRAFT

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*Industry Structure and Contestability in the European
Airports Business*

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'The essence of the case for competition is the impossibility of predicting most of its consequences'.

Alfred E. Kahn (1983).

1. Introduction

The European airports business, in contrast to the air carrier sector, is characterised by substantial barriers to entry and by a preponderance of national and local monopoly multi-airport companies in both public and private sectors. Some markets, especially the smaller ones, are served by a single airport. In consequence charges at many airports are regulated, increasingly through independent regulatory agencies but also by Ministries of Transport. Regulation of charges is deemed necessary in order to avoid the economic inefficiencies which would arise from the unrestrained exercise of market power by airports. There are however well-known costs to regulation, including

- Direct costs of regulatory agencies. The UK's Civil Aviation Authority spends €8m to €9m per annum on economic regulation.
- Costs of compliance, and of extensive consultation with regulators, for airports and their airline and other customers.
- Costs of legal disputes over regulatory issues. In Ireland, an unsuccessful High Court action by the regulated airports company against the statutory regulator cost the two parties €9m in legal costs alone.
- Economic inefficiencies arising from regulatory error, a consequence of the incomplete information available to the regulator and the requirement to forecast. Who can predict the true cost of capital? Who knows where the efficient production frontier lies?
- Inappropriate incentives deriving from the design of regulatory interventions. For example, some forms of regulation may hinder the attainment of dynamic efficiency through sending inappropriate investment signals.
- Costs arising from regulatory capture, should it occur. Regulatory capture by the political process, for example through the inclusion in the regulatory asset base of politically-driven gold-plated capital projects, is a risk additional to the risk of capture by the regulated industry. The literature concentrates on the second of these, but the first, regulatory capture by the political process, is a particular risk in aviation.

Since airports deliver a complex service rather than a simple standardised commodity, tariff regulation may tend to become more complex over time, intruding into service level agreements and the minutiae of business operation. These various costs of regulation are not of course unique to the airports sector. The existence of these regulatory costs has led some authors to propose alternatives to the direct regulatory setting of airport charges, and some governments, including those of Australia and New Zealand, to experiment with the suspension of airport tariff regulation altogether. Given the apparent success of liberalisation in the European airline sector, and the prevalence of State ownership, local multi-airport monopolies and intrusive regulation in

the airports business, it is not surprising that there have been calls for a retreat from airport regulation.

There seem to be two distinct strands in the literature arguing that it is possible to get by with less regulation. The first argues simply that there are many under-utilised airports in most parts of Europe, and that it is now possible, due to the proliferation of carriers, to encourage competition between them and hence to reduce the reliance on tariff-setting regulation. This line of argument asserts also that airports do not need to be close together in order to be in competition across substantial portions of their business. Potential competitors for cargo and connect traffic may be very distant, and customers seem willing to travel significant distances to the preferred airport for short-haul leisure or long-haul flights. Only for business short-haul, the preserve mainly of the legacy carriers, is the local monopoly power of individual airports so decisive as to be immune to competitive threat. Arguments along these lines are often heard from the low-fare airlines, and the case has been summarised in Barrett (2000).

A second argument against intrusive tariff regulation relies on the significance of complementarity in demand for the principal products of airports, specifically in the demand for aircraft landings and the demand of passengers for various retail services at airports. Even a monopoly airport will be sensitive to cutting its own throat by driving away lucrative non-aeronautical revenue. Since most of this revenue is generated by passenger volumes, there is a likelihood that a profit-maximising and unregulated airport monopolist will price the aeronautical product closer to the social optimum than would be the case without the restraint of the demand complementarity. How close to the optimum is an empirical question. This line of reasoning has been promoted by Starkie (2001) and others, and has recently been subjected to a formal analysis in Oum, Zhang and Zhang (2004).

They conclude, not surprisingly, that the power of the complementarity incentive depends on the importance of non-aeronautical revenues in the total revenue mix of the unregulated monopoly airport, as well as on certain elasticity terms. Thus airports with strong retail, catering and car-parking businesses have incentives (assuming they have some spare capacity) not to abuse their monopoly power if unregulated. Moreover these incentives could be substantial, perhaps enough to make the abandonment of tariff regulation a plausible option. Since regulation has costs, it is not necessary for the unregulated industry to adhere precisely to the social optimum for non-regulation to be the preferred option.

We would like to note however one potentially important qualification to this picture. The commercial (non-aeronautical) revenues of airports are assumed to consist of rental-type income generated, so to speak, from the passing trade. It is assumed not to contain any monopoly rent, and economic agents such as landlords should of course be encouraged to maximise their ordinary rental earnings. But one component, in the case of airport landlords, does consist of monopoly rent, and that is the supernormal profit earned from duty-free. Within Europe, this has been abolished, but it remains substantial at the long-haul airports. In effect, these outlets are the only shops in Europe allowed to buy whiskey from the distillery for €4 a bottle, when all other retailers must pay €10. This is not a business, it is a racket. It could be scrapped worldwide, or European airports could be margin-controlled by the State so as to eliminate the supernormal profit element. In either case, the complementarity incentive would be a weaker constraint on the unregulated monopolist.

This point also impinges on the empirical significance of the dual-till versus single-till debate. If duty-free excess profits were to be ended, whether through the abolition of duty-free worldwide or through the regulatory control of margins, the tariff increases consequent on a move to dual-till would be mitigated. While the airport operators are understandably shy about revealing duty-

free profits, it is clear that the figures must be substantial at airports with strong extra-EU traffic such as CDG, Frankfurt, Heathrow and Schiphol.

This paper is concerned with the first of these two strands in the literature exploring the possibilities for reduced reliance on airport tariff regulation in Europe. It focuses on the disposition of market power in the European airports business and with questions of market structure. It was argued in McCarthy and McDonnell (2005) that too little attention has been paid to market design in the airports sector, in contrast for example to electricity liberalisation. As a result the airports industry is far more concentrated than it needs to be, and this paper explores this notion in the context of a number of big-city European airports markets. A less concentrated industry ought to require less regulation, although we concede at the outset that complex empirical judgements would arise in each case about the impact of divestment of the multi-airport monopolies on contestability. In particular, while the two strands we have identified (complementarity in demand and the fruits of divestment/entry) ought to be mutually reinforcing, it must be acknowledged that divestment might not be enough, even with some help from demand complementarity, to enable the abandonment of tariff regulation in all markets.

The issue perhaps is not whether airport regulation can be abandoned altogether, but whether a re-designed market could get by with less.

Section 2 deals briefly with problems of market definition and Section 3 with the existing ownership structure in the European airports sector. In Section 4 we consider seven of the principal regional markets and the patterns of concentration in ownership, concluding with some options in promoting the emergence of a more contestable market with a reduced requirement for regulation.

2. Market Definition in the Airports Business

Airports are multi-product firms, see Trethaway (2001). The most important breakdown is the one between aeronautical and non-aeronautical revenue, and for many larger airports in Europe, the split seems to be in the general order of 50/50. With the exception of duty-free sales, the markets for the non-aeronautical products of airports appear to be competitive to a significant degree. Airport retail outlets compete with the High Street at origin or destination, parking with private competitors near the airfield (or with the taxi or public transport options), catering with origin off-airport outlets, with on-board and with outlets at the destination airport. But there can be substantial competition also for the aeronautical side of the business. In his recent review of these issues prepared for the Canadian government, Michael Trethaway poses the central issue as follows:

'The traditional view is that airports are natural monopolies. If this were true, then there would be little an airport can do to create new demand for airport services or to divert demand from other airports. This view is incorrect. There are many markets where airports provide services in competitive markets, and when taken collectively, for many airports the majority of their services are in competitive markets'.

For the aeronautical side of the business, the vectors of competition are many, differentiated by traffic type:

- **Connecting Traffic:** Hubs often have as much as 40% or more of arriving passengers departing by air. These passengers can choose competing hubs, including perhaps very distant hubs. Thus it is possible to travel Dublin-Denver, a city-pair not served direct, via London Heathrow, Paris CDG, Schiphol or Frankfurt, but also through New York, Boston, Chicago or Atlanta.
- **Cargo:** Trethaway notes that the footprint of an airport for cargo, which tends to be dominated by long-haul, is greater than the footprint for passengers. Lufthansa truck cargo to Frankfurt (as well as flying it) from many points around Europe, including the British Isles. Some legacy carriers are curtailing their acceptance of short-haul cargo in the interests of faster turnaround.
- **Adjacent Airports:** Some cities have several airports, but even single-city airports will have hinterland overlap with their neighbours. Passenger surveys at European airports show that origins/destinations within the apparent hinterland of airports in other cities are common, a reflection of the higher population density of Europe relative to the USA or Australia. European airports have more, and closer, neighbours, including ex-military airfields closed to commercial traffic by political/administrative decision.
- **Destination Competition:** Travellers are stuck with their origin region, if not their origin airport, but can choose their destination, particularly for leisure travel. It has been a feature of the London low-fare market (Europe's largest) in recent years that easyJet and Ryanair have opened up dozens of new destinations throughout Europe for short-stay leisure visitors. The local airports which serve these destinations have been induced to compete on price (including through subsidies from sub-national tiers of Government). Trethaway notes that there is competition between the airports in North America which serve as embarkation points for the cruise liner business. Destination alternatives in the leisure business put airports in competition with distant rivals.

- **Diversion to Competing Modes:** Short-haul travellers can opt for train, bus, private car or ferry as alternatives to air service. The terms of competition are greatly influenced by differential tax/subsidy policies, including capital subsidies. For many city-pairs, rail options (heavily subsidised) have been improving in Europe in recent years.

Definition of the appropriate geographical hinterland for each type of traffic is complicated. For the multi-product airport which faces several (or even all, as would be the case with some hubs) of these forms of competition, the measurement complexities will multiply. The market dynamism of recent years, induced by the low-cost carriers and the legacy carriers' response to their emergence, has made the definition of the relevant market and its measurement even more controversial, since conventional notions about airport hinterlands appear to have been overtaken by events. The experience of Ryanair in particular, the entrant carrier which has relied most on the stimulation of inter-airport competition, suggests that accepted beliefs about the size of airport hinterlands in Europe need to be revisited. For short-haul traffic, passengers appear to take a broader view of airport footprints than was the case pre-liberalisation, a reflection perhaps of the substitution of the air mode for the previous reliance on surface transport.

3. Structure of the European Airports Industry

It is customarily assumed that airports are local monopolies, and must therefore be tariff-regulated on some basis. It is, however, striking the degree to which the European airports sector is dominated by multi-airport companies, in both public and private sectors, which group in common ownership airports that could be seen as potential competitors.

In 2003, over 900 million passengers passed through those airports in Europe (defined as the EU-15 plus Norway and Switzerland) which had annual traffic in excess of 500,000. Only about one quarter of these passengers used airports which were outside the national and regional multi-airport monopolies, which account for all, or virtually all, of the traffic in France, Spain, Portugal, Norway, Sweden, Finland and Ireland, and which dominate the business in Germany, the United Kingdom and the Netherlands. In some of these countries, regional and local governments have circumnavigated the centralised rate-setting of the airport groups by offering subsidies direct to airlines over the head of the airport's actual owner. This appears to have happened in France and Spain. In other cases (e.g. Belgium) regional government has offered subsidy at airports owned locally, while in the UK, regional government subsidy has recently been introduced at privately owned commercial airports in Scotland and Northern Ireland.

Of course the regional and national airport monopolies are in many cases subject to some form of tariff regulation, but it could be argued that the need for regulation could be lessened if a vigorous divestment policy were to be pursued against the regional and national multi-airport monopolies. This is not to argue that no case for regulation would remain; but the extent of concentration at local and national level exacerbates the need for regulation through eliminating whatever scope for competition may be present between neighbouring airports.

3.1 Who Owns Europe's Airports?

A thumbnail sketch of airport ownership in the EU-15, plus Norway and Switzerland, goes like this:

Austria: The main Austrian airports are in separate ownership. Vienna (Flughafen Wien) has been privatised, with the remaining airports in public sector ownership. Vienna Airport is reportedly interested in acquiring a stake in neighbouring Bratislava, a potential competitor for Vienna.

Belgium: The principal airports in Belgium are in separate ownership. Charleroi, owned by the Walloon government, has emerged as a competitor for Belgium's main airport, Brussels Zaventem, and has renamed itself "Brussels South". There has been EU Commission intervention over subsidies paid by the Walloon government to Ryanair, the principal airline user of Charleroi Airport. It has just been announced that Macquarie, the Australian airports operator, is to acquire a controlling stake in Brussels Zaventem. At one stage, Fraport, Aeroports de Paris and Schiphol had all expressed interest, raising competition questions in each case.

Denmark: The main airports are separately owned, and the largest, Copenhagen, has been privatised.

Finland: A state monopoly owns all airports and the smaller remote airports are cross-subsidised.

France: There is public sector ownership of all French airports. The main Paris airports are operated by Aéroports de Paris (ADP), a state company, and the remainder by chambers of commerce. The government's intention is to privatise ADP as a unit, creating a privately owned monopoly in the Paris area, Europe's second-largest aviation market. ADP operates both Charles de Gaulle and Orly, and thus would control airport traffic in the Paris region for the foreseeable future, since the French government has ruled out the construction of a third major Paris-area airport. Le Bourget has been closed to airline traffic.

Germany: Diverse ownership structures have emerged, but local multi-airport monopolies are common. Partly-privatised Fraport owns Frankfurt-Main, Germany's main hub, but also controls neighbouring Frankfurt-Hahn and Saarbrücken. Munich controls Augsburg, Düsseldorf controls nearby Mönchengladbach, and the three Berlin airports are in common ownership. Dresden and nearby Leipzig-Halle are also jointly controlled, and Stuttgart has acquired control of nearby Karlsruhe.

Greece: The new Athens airport is let on a 30-year concession, but all other Greek airports are operated as a state monopoly, including numerous remote and island airports. There is believed to be considerable cross-subsidy.

Ireland: The three main airports are owned by a state monopoly. The Irish government has announced its intention to split them up into stand-alone competing entities, but without privatisation plans at this stage. The airports, at Dublin, Cork and Shannon, have partially overlapping hinterlands. The Irish government is, so far as we are aware, the first in Europe to propose the break-up of a multi-airport company. This proposal has been opposed by trade unions and regional lobbies.

Italy: There are diverse ownership structures, but with multi-airport monopolies in the main cities. Aeroporti di Roma (privatised) runs both Fiumicino and Ciampino in Rome, while SEA runs Linate and Malpensa in Milan and controls nearby Bergamo. Close neighbours Bari and Brindisi are under joint control also, as are Brescia and Verona.

Luxembourg: The sole airport is state-owned.

Netherlands: Schiphol controls Rotterdam, the second-busiest Dutch airport, and Eindhoven, the third busiest. They each handle less than 1 million passengers annually, versus 40 million at Schiphol. Privatisation of Schiphol has been deferred, and was opposed by the main user, KLM.

Portugal: A state monopoly owns all principal airports in Portugal. Construction of a proposed second Lisbon airport has been deferred.

Spain: All Spanish airports are controlled by AENA, a state monopoly. There are plans for new airports outside the AENA system. The centre-right Spanish government which lost office in March had been considering the privatisation of AENA as a group, that is, as a regulated national monopoly.

Sweden: Apart from the small Stockholm-Skavsta which belongs to the listed UK company TBI Plc, all Swedish airports are run by a state monopoly. There is cross-subsidisation of smaller and remote airports.

United Kingdom: The UK has diverse, mainly private, ownership structures. BAA Plc owns the three main airports in London, which give it a dominant (but regulated) position in the south-east, and a further three—Aberdeen, Edinburgh and Glasgow—which give it a dominant position in Scotland. The other main UK airports are municipally or privately owned, with some multi-airport patterns. The listed TBI group operates a number of the smaller non-adjacent airports, including easyJet's main UK base at Luton. Manchester airport, owned by local authorities, operates three other (non-adjacent) UK airports.

Switzerland: Swiss airports are owned separately. Zurich has been privatised.

Norway: A state monopoly owns all airports, with cross-subsidisation of smaller and remote airports.

3.2 Striking Incidence of Monopoly in Airport Ownership

While the incidence of national and regional monopolies is striking, it does not follow that competition would be enhanced materially through an indiscriminate divestment policy forced on the multi-airport companies. It hardly matters that Bilbao and Palma de Mallorca belong to the same company, AENA, or that a German or French airport company should be discouraged from acquisitions in Finland or Portugal. But it surely matters more that Heathrow, Gatwick and Stansted in London belong to BAA, or that in the cities of Berlin, Paris, Milan and Rome all main airports are jointly owned. There are numerous other examples of smaller but contiguous airports that are in joint ownership, including some recent acquisitions which would have been questioned on competition grounds in other economic sectors. We have noted that a substantial portion of total European traffic goes through airports whose most immediate competitor belongs to, or is controlled by, the same company. A divestment policy would not eliminate the case for regulation, since capacity-constrained and local monopoly airports would remain; but it should create scope for a reduction in the need for intrusive regulation.

There are interest groups that defend the status quo, aside from the existing multi-airport companies. The principal defenders are trade unions and regional lobbies. Trade unions naturally gravitate towards monopolies and the potential rents the unions can seek to share. Multi-airport groups are often involved in cross-subsidy, with profitable airports carrying the losses at smaller units. Governments are of course entitled to subsidise regional transport, and there are numerous island and remote communities which politicians may deem worthy of subsidised airports or air services. But these subsidies are often not even measured when buried in the accounts of state monopoly airport companies, and the lack of transparency inhibits efficient allocation of subsidy. Nor is subsidy confined to small, remote airports.

To our knowledge, only one proposal to merge two hitherto independent neighbouring airports has been considered by a European competition authority. This was when Belfast International airport proposed to acquire the smaller Belfast City airport. The matter was the subject of a lengthy report by the UK's Monopolies and Mergers Commission (1996). It concluded that the proposed merger would be anti-competitive, since it would have created a monopoly in the provision of airport services in the north-east of Ireland. It recommended that the proposed merger be forbidden. Preventing the creation of a local multi-airport monopoly, rather than regulating it afterwards, was the preferred solution. The UK government accepted its advice, and the merger did not go ahead. If the same principles were applied to numerous existing multi-airport groups, they would be forced to divest. Indeed, their formation would have been prevented.

Moreover the same analysis would indicate that proposed acquisitions such as that of Bratislava by Vienna would not be permitted. Applied to the existing multi-airport companies throughout Europe, including the UK, the reasoning in the MMC report would point to a wide-ranging policy of forced divestment.

The pattern of multi-airport monopolies in large cities is not exclusively European. It is found also in cities such as Chicago, Montreal, New York, Houston and Washington DC, as well as in Latin America, and reflects the close historical state involvement in the aviation sector. In the liberalisation of the airline business, ease of entry for new carriers and the inherent contestability of many routes were enough to ensure that the dominant position of incumbents could be effectively challenged, without forcing divestment on legacy airlines. But entry is far more difficult in the airports sector, and there are unavoidable elements of local monopoly.

But it is curious that air transport liberalisation in Europe has thus far not been accompanied by any policy actions to break up the multi-airport monopolies. There is instead an acceptance that these monopolies, as well as single-airport local monopolies, may have to be tariff regulated; but it is surely fair to ask whether the maximum potential of competitive forces is being realised within the prevailing industry structure. It would not be regarded as an acceptable or adequate competition policy to permit industrial mergers to create market dominance, saying that they could always be price-capped. Structures are permitted to survive in the airports business which would not be permitted to emerge had they not pre-existed under the old state monopoly aviation regime. It is difficult to discern any economic rationale for this policy inertia, and it has attracted repeated criticism from industry observers.

Thus Europe's airports continue to be owned mainly by governments and by local public authorities, often in multi-airport monopoly structures. Where government has privatised, or is contemplating privatisation, the multi-airport monopoly model has been retained. The potential for competition cannot be realised in this structure, which creates regulatory burdens as well as scope for politicisation of decisions about access, pricing and investment in expansion.

4. Concentration in Major European Airport Markets¹

In this section we review briefly the distribution of airport capacity in a number of European key markets where regional monopoly is significant. Measurements of distance and travel time are computed

- from the centre of the main city
- in accordance with current data from the website www.maporama.com.

4.1 Barcelona/Catalonia

All Spanish airports are owned by AENA. The dominant airport in the region is Barcelona, but Girona, Reus and Perpignan (France) are within 2 hours drive-time of central Barcelona. There are plans for a new airport at Lleida. Within a 4 hour zone are Zaragoza, Valencia, a new airport planned at Castellon, and Toulouse (France).

Table 1: Airports in the 2-Hour Zone of Barcelona 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
Barcelona Airport	9.1 km	00h 07	22,541,500	89%
Girona Airport	85.3 km	00h 51	1,428,886	6%
Reus Airport	96.2 km	00h 58	838,207	3%
Perpignan Airport (France)	193.7 km	01h 59	469,610	2%
			25,278,203	100%

The three AENA airports have a traffic share, and hence concentration ratio C1, of 98% in the 2-hour zone at present. Divestment would reduce this to 89%, but this under-states the potential impact on Barcelona's dominance of a divestment policy. Both Girona and Reus have jet-capable runways of about 2,400 metres, and it is clear from experience at airports such as Luton that terminal capacity can be added at the newer airports at modest cost. Girona and Reus could expand substantially and rapidly. Luton will handle over 8 million passengers this year, in a terminal which cost just €58m.

In contrast, AENA policy appears to be rapid and costly expansion at Barcelona, for which local politicians have hub and long-haul ambitions (which may be unrealistic). A third runway has been added, and further planned terminal expansion will lift capacity towards 50 million. It is clear that this is not the cheapest way to provide additional capacity in Catalonia. The low-fare carriers have been attracted into Girona and Reus in part by subsidy from local levels of government; the tariffs are set by AENA in Madrid. But private owners of these airports would have incentives to price aggressively to attract traffic.

¹ This section summarises a more detailed note on these seven regions which is available from jacinta.mcdonnell@davy.ie.

4.2 Berlin/Brandenburg

The 2003 distribution of traffic in the 2-hour zone of central Berlin was as shown in Table 2.

Table 2: Airports in the 2-Hour Zone of Berlin 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
Flughafen Berlin Tempelhof	4.1 km	00h 07	451,116	3%
Flughafen Berlin Tegel	8.4 km	00h 14	11,055,303	66%
Flughafen Berlin Schoenefeld	19.4 km	00h 31	1,684,384	10%
Flughafen Leipzig Halle	153.6 km	01h 27	1,863,692	11%
Flughafen Dresden	162.9 km	01h 38	1,507,912	9%
Flughafen Rostock	182.4 km	01h 39	134,538	1%
Flughafen Braunschweig	205.4 km	01h 49	105,208	1%
			16,802,153	100%

The three airports in Berlin itself are in common ownership, as are Leipzig-Halle and Dresden. Both have jet-capable runways, as does Rostock, and there are plans for jet-capability at Braunschweig. Within the 2-hour zone, there are jet-capable runways at Schwerin-Parchim (controlled privately by the UK company, PlaneStation), Neubrandenburg and Cottbus.

The decision to expand at Schoenefeld, and to close Tempelhof and Tegel, continues to be dogged by controversy. The closure of Tempelhof has been deferred by the courts, but the real issue is the closure of the perfectly adequate and convenient airport at Tegel. The same has happened at Munich. Would this be the pattern in a privatised and less regulated market?

4.3 Central Germany

Table 3: Airports in the 2-Hour Zone of Frankfurt 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
Flughafen Frankfurt	13.0 km	00h 15	48,107,669	56.7%
Flugplatz Egelsbach	16.4 km	00h 15	71,689	0.1%
Flughafen Hahn Flughafen	114.7 km	01h 18	2,410,952	2.8%
Karlsruhe/Baden-Baden	162.5 km	01h 29	298,825	0.4%
Flughafen Koln/Bonn	167.4 km	01h 32	7,697,725	9.1%
Flughafen Saarbrücken	162.9 km	01h 33	409,079	0.5%
Flughafen Stuttgart	197.7 km	01h 49	7,464,903	8.8%
Flughafen Dortmund	211.0 km	01h 53	1,023,339	1.2%
Flughafen Nürnberg	213.5 km	01h 58	3,240,787	3.8%
Flughafen Dusseldorf	227.3 km	02h 03	14,172,922	16.7%
			84,897,890	100.0%

Fraport dominates, and controls Hahn and nearby Saarbrücken. Stuttgart has acquired control of nearby Karlsruhe, a Ryanair destination re-named Baden-Airpark, 110 kms and not much more than 1 hour from Stuttgart-Echterdingen. Dusseldorf controls nearby Moenchengladbach. There are unused jet-capable airports also at Zweibrücken and Lahr, the latter controlled by

PlaneStation. It was recently refused planning consent for commercial traffic. It should be clear that the costs of expansion at Frankfurt are controllable through greater reliance on lower-cost neighbouring airports. The acquisition of control at neighbouring airports by Dusseldorf, Frankfurt and Stuttgart is a striking pattern.

4.4 Bavaria

The current position in the zone around Munich is as shown in the table.

Table 4: Airports in the 2-Hour Zone of Munich 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
Flughafen Munich	25.9 km	00h 17	24,013,458	64.6%
Flughafen Augsburg	48.1 km	00h 26	61,856	0.2%
Salzburg Airport (Austria)	128.9 km	01h 09	1,224,675	3.3%
Flughafen Nürnberg	165.6 km	01h 33	3,240,787	8.7%
Innsbruck Airport (Austria)	164.5 km	01h 34	674,763	1.8%
Flughafen Stuttgart	195.9 km	01h 45	7,464,903	20.1%
Flughafen Friedrichshafen	188.5 km	01h 59	499,026	1.3%
			37,179,468	100.0%

Augsburg, which is served by the Munich suburban rail system and is not much further out than the main airport, is not jet-capable and is physically constrained. The Lufthansa affiliate Augsburg Airlines has ceased service from Augsburg. There is an unused airport with a jet-capable runway at Lagerlechfeld, just south of Augsburg, and the possibility of development at Memmingen. The low-fare carriers do not have a strong presence in Bavaria, and the airports position appears to be contributing to this.

There seems to be a pattern in Germany of refusal to permit commercial operations at under-utilised airfields, ostensibly for environmental reasons, and of purchase by incumbents of neighbouring potential entrants.

4.5 London Region

As a consequence of the decision, enshrined in the 1986 Airports Act, to privatise the three main London airports as a group, BAA Plc is dominant (but of course tariff-regulated) in the southeast of England.

Table 5: Airports in the 2-Hour Zone of London 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
London City Airport	12.7 km	00h 19	1,470,576	1.1%
Luton Airport	34.5 km	00h 23	6,785,732	4.9%
Stansted Airport	41.6 km	00h 26	18,716,265	13.4%
Gatwick Airport	37.8 km	00h 33	29,893,288	21.5%
Heathrow Airport	31.2 km	00h 35	63,208,042	45.4%
Southend Airport	50.8 km	00h 48	2,702	0.0%
Southampton Airport	115.0 km	01h 07	1,217,891	0.9%
Bournemouth Airport	153.4 km	01h 29	460,872	0.3%
Birmingham Airport	158.8 km	01h 32	8,923,902	6.4%
Nottingham East				3.1%
Midlands Airport	167.0 km	01h 36	4,253,684	
Norwich Airport	170.2 km	01h 52	447,112	0.3%
Bristol Airport	190.8 km	01h 58	3,886,740	2.8%
			139,266,806	100.0%

The Manchester Airport Group, far less significantly, controls Nottingham and distant Bournemouth. Not shown in the table is Coventry, closer to London than Birmingham, where commercial traffic operations by a low fare carrier (Thomsonfly) have recently commenced.

There is a blunt asymmetry in UK policy: the merger between the two Belfast airports was refused. But the same logic would break up BAA Plc. In the UK, you may not create dominance, but you can keep it if you already have it (subject to regulation). Elsewhere in Europe, it would appear that you may create or sustain local dominance through the acquisition of entrants, without challenge from the competition authorities.

Capacity shortages in the southeast of England have been a recurring problem for decades. It is fair to ask whether the combination of the structure of regulated dominance has contributed to this, through the deterrence of entry, and whether divestment and deregulation in 1986 would have produced a better outcome.

4.6 Milan/Lombardy

The pattern of regional monopoly is also evident at Milan, and the figures are shown in the next table.

Table 6: Airports in the 2-Hour Zone of Milan 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
Linate Airport	7.4 km	00h 12	8,755,971	24.6%
Bergamo Airport	43.7 km	00h 31	2,822,850	7.9%
Malpensa Airport	39.2 km	00h 32	17,514,750	49.1%
Brescia Airport	104.4 km	01h 06	270,285	0.8%
Parma Airport	118.1 km	01h 13	65,178	0.2%
Torino Airport	133 km	01h 21	2,804,655	7.9%
Genoa Airport	143.8 km	01h 26	1,032,758	2.9%
Verona Airport	143.8 km	01h 27	2,398,373	6.7%
			35,664,820	100.0%

Brescia and Verona are in common ownership, as well as Malpensa and Linate whose owner SEA, is part-owner and operator of Bergamo. Malpensa airport is the same distance from Milan city center as Bergamo, and appears to have been a politicised project from the beginning. At one stage, the intention was to close the convenient and popular airport at Linate. Milan shares with Barcelona the burden of a twin-hub mentality – in Spain, both Madrid and Barcelona have hubbing ambitions, as have Rome and Milan. The total number of meaningful long-haul hubs in Italy and Spain may well turn out to be one, or possibly even zero, and none of the four cities concerned are obvious locations for short-haul hubbing.

4.7 Paris

The most significant upcoming privatisation is that of Aeroports de Paris, the state monopoly in the Isle de France. The position in the 2-hour zone around central Paris is as follows:

Table 7: Airports in the 2-Hour Zone of Paris 2003

	Total Distance	Travelling Time	Terminal Pax 2003	%
Orly Airport	10.9 km	00h 08	22,450,589	31.0%
Le Bourget Airport	10.9 km	00h 10	N/a	N/a
Charles De Gaulle Airport	19.2 km	00h 14	48,028,297	66.3%
Beauvais Airport	80.2 km	01h 01	968,583	1.3%
Rouen Airport	125.9 km	01h 21	27,843	0.0%
Reims-Champagne Airport	145.4 km	01h 32	40,344	0.1%
Deauville Airport	189.9 km	01h 53	23,277	0.0%
Le Havre Airport	196.5 km	02h 02	57,936	0.1%
Lille Airport	208.6 km	02h 02	870,500	1.2%
			72,467,369	100.0%

The absence of scheduled airline traffic from Le Bourget is a political decision. There appears to have been no serious consideration in France to the splitting, on privatisation, of Orly from CDG. The slow development of Beauvais is also interesting: none of the low-fare carriers have chosen it as a base, and Ryanair, the principal customer, serve it as an out-station only. This despite the fact that the Paris region is the second-largest aviation market in Europe. The weak airport competition in the Paris region appears to have constrained the expansion of low-fare capacity in this key market, to the benefit of slot-owners at CDG and Orly, the largest of which is Air France.

There are severe (and cost-inducing) night-flight restrictions at Beauvais, and easyJet has complained about slot re-allocations at Orly. The expansion of air carrier competition in this market requires policy decisions about airports.

5. Creating a Competitive European Airports Industry

If the multi-airport monopolies survive, then protection of the consumer interest (in this case the interest of airlines and their customers) will require extensive regulation. But it may be unnecessary to continue with intrusive and detailed regulation where the full potential of competition has not been realised, and the current perceived "need" for regulation reflects the unwillingness to divest.

5.1 Limits to Competition

It is useful to think of Europe's airports, by analogy with the air carrier industry, as consisting of *legacy* airports (the big city airports) and *entrant* airports in their hinterlands. It has been argued (Forsyth 2003) that it may be inefficient to cater for traffic increases at the entrant airports if the legacy airports enjoy scale economies. In a competitive airports market without subsidy this problem takes care of itself. Legacy airports with spare capacity, or the ability to add it cheaply by expanding along a declining cost curve, will win the battle with foolish entrants. Natural monopolies do not need regulatory protection. They may need to be protected from subsidised competition, but not from inefficient entry.

In any event, it is not clear that there really are economies of scale, and Niemeier (2004) has hypothesised a saucer-shaped cost curve, with a zone of decline eventually giving way to diseconomies as airports grow beyond a critical size. There are obvious reasons, including the move from surface to multi-storey car-parking and the buy-off of local environmental lobby groups, as well as physical constraints. Economies from the joint operation of several neighbouring airports are sometimes asserted, but we are not aware of systematic evidence.

The costs at Terminal 5 in Heathrow (almost €6 billion for a single, admittedly large, terminal!) and the €3 billion quoted for a second runway/terminal at Stansted are so out of line with expansion costs elsewhere as to suggest that legacy and entrant airports are expanding along completely different cost curves. This is not just size-related, it seems to depend on ownership and political ambition, as at Barcelona. The airport at Cork in the south of Ireland will handle about 2.5 million passengers this year. The current terminal/apron building programme, due to end in 2005 and undertaken in defiance of the regulator, will cost at least €170m, in excess of the *total* capital stock in place at many far larger airports.

The diseconomies at legacy airports may also come in the form of excess operating costs. These airports are in many cases still in the public sector, or have only recently emerged from it. They are heavily unionised, and the cost-increasing impact of unionisation can survive liberalisation for decades, as the shareholders in US legacy airlines have discovered. Benchmarking studies have revealed large differences between airports in, for example, payroll costs per passenger. Entrant airports have advantages also in this aspect, and the analogy with entrants in the air carrier business is striking. A further analogy is that economies-of-scale arguments, amongst others, were used against airline liberalisation.

It is tempting to conclude that 'extensive research is needed into the scale economy issue'. However cross-section studies across airports operating under very different regimes can be a poor guide to the shape of the expansion path for a given facility, analogous to the time-series versus cross-section problem in econometrics. It is important also to remember that the market will be better than historical data at discovering what the future cost curve really looks like.

There is also the (related) question of sunk costs. Widespread diversion of traffic from legacy to entrant airports would inflict losses on the owners of legacy airports, particularly where gold-plating has been indulged in. But it would not damage the assets, just the shareholders. At Barcelona, the assets would not disappear into the Mediterranean if the entrant airports were successful, just the shareholder equity! There is a difference between inefficient bypass where valuable assets are no longer used, and the infliction of losses on unwise investors, *vide* the Channel Tunnel. But if greater economy in the use of capital is to be incentivised, some shareholder pain may be the price of dynamic efficiency. How many White Elephants have been avoided as a result of the losses caused by the Channel Tunnel?

The major reform needed in the European airports sector may not be the protection of legacy airports from entrants, but rather the protection of consumers from politicians.

5.2 Benefits of Competition

While airports are capital intensive, the scope for economy in operating costs should not be ignored. Twenty years ago, during the debates on airline liberalisation, the *scale*, as distinct from the direction, of the impact of regime change on costs was not foreseen. In the legacy airports, there may be considerable scope for cost reduction in operations, and this is certainly the view of the low fare carriers.

But a European aviation sector with a larger number of smaller airports, rather than dominance by increasingly expensive expansion of the bigger legacy airports, could see the greatest savings in capital investment. If every expansion of capacity of 30 million passengers is to cost as much as T5 at Heathrow, roughly €200 capital cost per passenger, European airfares will rise dramatically. The debt-service plus depreciation charge (ignoring operating costs) flowing from capex costs at €200 per passenger must be at least €25. At Luton, the capital cost per passenger of the recent expansion appears to be of the order of €15, less than 10% of Heathrow T5.

There is also the risk that the removal of market pressures from location and expansion decisions is concealing some important long-term trends. European cities are sprawling, with both population and employment more dispersed than ever. This argues for the encouragement of entrant airports in the hinterland, and is also a reason why expansion costs rise at legacy airports as they become enveloped by the city. Many of these airports were at the edge of cities when they were built. In addition, the hub-and spoke model favoured in recent decades by legacy airlines and airports is coming under pressure from point-to-point growth. The potential for a point-to-point explosion in long-haul is also a factor in the context of the extension of open-skies outside the European, North American and Australasian markets. Such developments would also enhance the economics of entrant airports and damage the attractions of reliance for expansion on the big-city hubs.

5.3 A European Policy on Mergers and Divestment

A pro-active policy of divestment, which should ideally be Europe-wide, could be built around two simple rules:

- Prohibit any company from owning or controlling more than one of the main European hubs. Which airports should be on the list is a matter for debate, but it should certainly include London Heathrow, Amsterdam Schiphol, Frankfurt and Paris Charles de Gaulle. In addition to the second airports of London (Gatwick) and Paris (Orly), a longer list could include smaller

hubs such as Brussels, Copenhagen, Madrid and Zurich. It is widely acknowledged that hubs compete, and common ownership of existing or potential European hubs would inhibit competition.

- Prohibit dominance-creating acquisitions and the continuance of multi-airport groups that own or control adjacent airports. A detailed study would be required in order to give operational meaning to the term "adjacent", but a prohibition on ownership of airports inside a surface distance of about 200km is what we have in mind. There could be exemptions for smaller airports and for remote and island communities.

It is also worth considering whether vertical integration, in the form of ownership by airlines of airport assets should be discouraged. This has given rise to contestability problems at US airports. Some European governments have chosen vertical as well as horizontal divestment in other sectors, for example electricity, where generators have been excluded from the transmission business.

Implementation of this policy would not require privatisation, although private ownership would be more likely to release competitive forces. States and municipalities could retain ownership at central or local government level if they so wished. This is what the Irish government is seeking to do in the case of its state monopoly airports operator. The three Irish airports will become distinct and separate, but state-owned, companies, hopefully without subvention. In a new European airports regime, there would need to be clear rules prohibiting state aid, with possibly an exemption from this prohibition for airports serving remote or island communities. Vertical integration, where airlines own airports or essential airport facilities, could be prohibited.

If a policy of this kind were in place today, unfortunately it does not follow that it would be safe to dispense with regulation, for two essential reasons. The first is that several key airports are capacity-constrained, and some capacity margin is essential for competition to work. The second is the inevitability of single-airport cities, distant from any meaningful competitor, and hence of local monopoly.

5.4 A "Minimum Regulation" Regime

The perception that airport regulation can become excessive and intrusive has led the authorities in both Australia and New Zealand to experiment with systems which consist of regulatory oversight and reserve powers of actual tariff-setting. The arrangement might be described as "regulation by threat". The direct costs of regulation and the potential impact on incentives have led a number of economists to propose a less interventionist regime. We discussed above the arguments for greater reliance on demand complementarity, and the self-interest of airports.

An objection to reliance on demand complementarity to constrain rent-seeking airports is that their non-aeronautical revenues derive in part from duty-free, itself a monopoly granted by the state and a source of monopoly rent. If duty-free were scrapped, the suggestion would have greater appeal, but less potency. The issue is intimately bound up with the controversy surrounding the single-till principle. This has the effect of crediting to the airlines whatever surplus the airports can earn on non-aeronautical activities. In the UK, the Civil Aviation Authority (CAA 2003) has signalled its preference for a move away from this cross-subsidisation, in contrast to the views of the Competition Commission (2002). But the latter's analysis has not found favour with academic economists, whose concerns are represented in a recent paper by Stephen Littlechild (2002).

Littlechild notes that the Competition Commission's contention that dual-till would see some airports increase their charges is a positive, rather than a negative, feature of the CAA's proposal. He acknowledges the need to incentivise capacity management and expansion, and the inhibiting effect of single-till on the attainment of these objectives. But Littlechild also stresses the substantial windfall that could accrue to some airport owners, and proposes that this be taxed away into a fund earmarked for airport investment. At recent reported prices, slots at Heathrow, whose value derives from single-till price-capping, are worth in aggregate almost as much as the value of the airport itself in the books of BAA Plc. It appears that Littlechild and the CAA, in their opposition to single-till, are more representative of mainstream professional opinion than are the authors of the Competition Commission report. See also the report of the Australian Productivity Commission (2002).

In addition to a break-up of the multi-airport groups, the EU Commission should consider a new Directive on airport charging. This would be designed to extend, with as little regulation as is needed, to the airports business the market disciplines already operating to good effect in the air carrier market. It should contain the following five principles:

- Member States would be free to exempt from regulation airports below a specified size threshold.
- Airports deemed to have significant competitors, post-divestment, would be subject to price surveillance, exempt from price-cap regulation but exposed to the regulatory threat of price-capping if abuse could be demonstrated. They would of course be subject to conduct regulation under ordinary competition law.
- There would be a presumption of price-cap regulation only at larger airports deemed to possess unavoidable and substantial market power.
- There should be a requirement to move away from single-till.
- Principles of transparency and non-discrimination should be carried over from the earlier EU Commission draft Directive on Airport Charges, which failed to be adopted due to member-State opposition.

In this regime, avoidable monopolies would be dealt with through divestment, rather than through regulation. Problems of collusion between airports or exploitation of market power through internal cross-subsidisation of traffic categories (for example at connecting hubs) could be dealt with through general competition law.

There is one great practical objection to a scheme of this type. Certain single-till airports would enjoy a windfall, and certain airlines (mainly flag-carrier incumbents) would take a hit, since the value of slots would be eliminated. The fact that flag carriers do not show slot values on their balance sheets (although British Airways is beginning to do so) is irrelevant; the rents they are earning come through the profit and loss account. Taxing away the windfall into an airport development fund, as suggested by Stephen Littlechild, is one option. But bearing in mind the gold-plating problems which already exist, an airport development fund might not be needed, and would remove airports from capital market disciplines. Given the generally weak financial condition of many flag carriers, a more direct approach would be to ignore the legal niceties and compensate the incumbent airlines directly, out of the coffers of the beneficiaries, the congested airports. The coffers in question would grow rapidly as charges would rise. Opposition to a more rational regime for Europe's airports would surely be neutralised through a fair scheme of compensation.

In conclusion, the key issues are to do with competition, particularly entry, and with the elimination of waste in capital spending. George Stigler (1971) could have had European airports in mind when he wrote

'Every industry or occupation that has enough power to utilise the state will seek to control entry'.

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