

**Airport Competition and the Efficiency of Price Structures at Major
Airports**

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Introduction: The Problem

In recent years, both in Europe and the US, there has been increasing use made of secondary airports, which are often some distance from the main origin/destination city. This development has been especially associated with the growth of low cost carriers (LCCs). These have sought to cut costs in whatever ways possible, and they have been prepared to bypass main airports if they have been able to negotiate good deals from secondary airports. At least, for LCCs, the secondary airports are providing some competition for the main airports.

Normally, we would expect that an increase in competition would be welfare enhancing. However, we need to be aware that this is not always the case. One situation where additional competition can be welfare reducing is outlined by Suzumura and Kiyono (1987). When extra firms come into an oligopolistic market, they may survive, but overall welfare can fall because of the loss of economies of scale. Another case, more directly related to the airport one, is outlined by Braeutigam (1979). A natural monopoly (eg a rail system) may be covering its costs using Ramsey prices. However, if competition develops for some of its product range (eg because of the entry of road based carriers), it will have to restructure its prices, to meet the competition. The result will be a move away from the initial Ramsey second best solution, to a new solution which will be inferior (though perhaps not by very much).

This situation can happen with airports, though this is not always the case. Sometimes, when secondary airports enter, they take traffic away from major airports which are facing excess demand. In such a situation, their entry is likely to lead to a more efficient allocation of flights to airports. This possibility is recognised, though it is not considered in this paper.

However, when the major airport has ample capacity, the marginal cost of handling extra flights may be minimal (and well below price). The secondary airport will attract flights away from the major airport, and overall costs may increase, especially if the travelling costs of passengers to the secondary airport are included. The major airport might or might not be able to adjust prices to capture the traffic. If it can, an efficient allocation of flights to airports will come about, but the price structure of the major airport will be less efficient than before (though the welfare loss from this may not be substantial). Often, though, airports do not respond, perhaps because it is difficult to do so. One is left with a situation whereby flights which could be handled at minimal cost at the

major airport are handled at inconvenient secondary airports at no less, and possibly greater, cost. As an example, Ryanair flights use Lubeck airport to Hamburg destined traffic, even though Hamburg airport has ample spare capacity for most of the times Ryanair would like to fly.

In the next section, the options open to the major airport to adapt its pricing to meet the new competition are considered. Then in the following section, the incentives for an airport to respond are considered- these depend on ownership and regulation. After this, the issue of why secondary airport charges are below those of the major airports is considered; do they have lower costs, or are there other factors present? Finally, some comments are made about the institutional arrangements under which airports compete- competition may not work well if these are poorly structured.

Competitive Responses

Suppose a situation whereby an established major airport has excess capacity. It is possible that the marginal cost of a flight is quite low, though the airport will face large sunk costs associated with its construction, for example, in building the runways. Suppose further that the airport is operating under a cost recovery constraint, and that this takes the form of earning a target revenue each year- this target is set by the costs allocated each year. Note that this is an artificial, accounting based, version of cost recovery- economic cost recovery only requires that the total cost be recovered over the airport's life span, and a more efficient pattern of cost recovery would involve loading revenue targets on to years when the airport is busy. In practice, however, many airports operate with this type of constraint. The airport implements a weight or passenger based schedule of prices which can be considered to be an approximation to Ramsey pricing.

When faced with competition from the secondary airport, one response would be to rework the price schedule. For this to work, it would be necessary to be able to lower prices for the category of user being attracted away. Thus if the LCC is using Boeing 737 sized aircraft, it would be necessary to lower prices for aircraft with a weight or passenger load of this aircraft type. Charges for both larger and smaller aircraft would have to be adjusted upwards to meet the cost recovery constraint. The result would be a rather artificial price structure, though it might work. It will be a less optimal one than in place before, since an

additional constraint has been added to the Ramsey pricing problem. However, the welfare loss is not likely to be large.

An alternative response would be to practice implicit or explicit price discrimination. Implicit price discrimination is where lower prices are offered for categories of flights which happen to encompass the LCC's flights. An example would be discounts for new services- the LCC will be able to take advantage of these, though the FSC would only be able to make limited use of the discounts, since most of its flights would not be new. Some airports offer discounts for airlines newly operating from them. At the extreme, an airport may simply practice explicit price discrimination, by offering lower prices to the LCC. It is very difficult for one user to on-sell to another, and since the airport is a near monopoly, the FSC will just have to pay up whether it likes it or not. This said, many airports may not like to discriminate against its old customers, and they may not see doing this as profitable in the long run.

Another way in which an airport may attempt to address the problem is to change the price structure in such a way as to make it more attractive to the LCC. It could introduce peak/off peak pricing, and give the LCC (and any other users) the option of reducing costs by using capacity in the off peak. This option need not be particularly attractive to LCC, since the LCC may need to keep its aircraft fully utilised, and it may not have the scope to fly mainly in the off peak. This response could help a little if the LCC does have some scope to organise its flights into the airport such they do occur mainly in the off peak.

Another possibility is that the major airport has not been minimising its costs in the past, and that there is scope for cost reductions. It is possible that the secondary airport can offer lower charges because it is more efficient. The competition which the major airport now faces forces it to review its costs, and it may be able to reduce its costs, and lower all charges, and thereby attract the LCC. While this may not happen overnight, it could be that competition from the secondary airport is the wake up call to the airport, which has allowed costs to rise over the years during which it has faced no competition. In this situation, the additional competition from the secondary airport has a positive effect on welfare through its impact on productive efficiency.

While all these options could be feasible, it is quite possible that they are not, and that the airport cannot adjust its price structure or level so as to attract the LCC. If so, it loses the LCC's business. Clearly, this happens in many, perhaps the majority of, cases. This is the least efficient possible

response, since there are non zero costs of using an alternative airport when the marginal cost of using the existing airport is either zero or low.

Incentive Issues

As always, the responses to competition depend on the incentives the airport faces. Airports could be publicly owned, and set a cost recovery target. Such airports are not likely to be interested in maximising profits. Airports could be fully or partially privately owned and subject to regulation. If this regulation could take the form of rate of return regulation (e.g. Düsseldorf). Alternatively an airport could be subject to incentive regulation, such as price caps (e.g. Hamburg airport) or profit sharing/sliding scale regulation.

The response of the publicly owned or the rate of return regulated airports is not likely to be one of attempting to capture the LCC's business. The publicly owned airport is not interested in profit opportunities, and the regulated airport cannot gain extra profit from it. When costs are fixed, revenues are fixed. When costs are variable, revenues will be allowed to increase only to the extent that costs increase, allowing no extra profit. Such an airport will be faced with a low demand elasticity for its output and will have no difficulty in achieving cost recovery, and will not have an incentive to chase the LCC's business. If, however, the airport is a size maximiser, it will have an incentive to increase the cost base by attracting the LCC.

The airport operating under incentive regulation does have an incentive to gain the LCC's business. Suppose there is a price cap on average revenue per passenger (a common form). If it can adjust its price structure in some way to attract the LCC, it will be allowed to earn more revenue, and assuming that the price cap is set at above marginal cost, it will earn more profits.

If cost reduction, to enable lower overall prices, is a feasible option, the airport may have an incentive to try doing it. An incentive regulated airport may not have been minimising costs (incentives for cost reduction are rarely perfect), but now it has a stronger incentive to keep costs down. The rate of return regulated airport will not see any point in reducing its costs because it will lose revenue if it achieves this. If it is a size maximising airport, it will have even less incentive to respond, because reducing its costs means reducing its size in terms of inputs (labour, capital).

Why are Secondary Airports Cheaper?

In the discussion above, it has been assumed that prices at the secondary airport are lower than those at the major airport. Hence the LCC is willing to use the secondary airport- it would not be if the latter were more expensive.

However, given the normal patterns of airport costs, it would be expected that secondary airports would have higher, not lower, costs. If there are economies of scale present, smaller airports would have higher costs. If airports involve substantial sunk costs, for example, in the provision of runways, the average cost of the larger airport would be lower than that of the smaller airport because the sunk costs would be averaged over more users. In spite of this, many secondary airports are able to offer lower price schedules, which is why they have been so successful in attracting LCCs. There must be other factors at work.

1 Undermining Price Discrimination. Ramsey price structures involve prices which differ for different users. Given the weight or passenger based charges, larger aircraft pay more than the average, but smaller aircraft pay less. An airport which has the same average cost could offer a lower price than the major airport to the large aircraft. Price discrimination only works if there is no competition.

In practice, this is probably not the main explanation for the lower prices at smaller airports. However, the aircraft favoured by LCCs is the Boeing 737- for some major airports, specialising in short haul traffic, this may be a relatively large aircraft- much of the traffic may be regional jets and commuter aircraft.

2 Greater Efficiency. Clearly, if airport costs are dominated by sunk costs, it would be difficult for a smaller airport to have lower costs than a major airport (since the marginal cost of sunk costs is zero). However, variable costs may be present, and they could be quite significant. The lower operating costs of an efficient small airport could outweigh the economies of scale gained by the less efficient major airport. If so, overall average costs could be lower.

If this were so, then it would be efficient if the smaller airport gained the LCC market, since costs overall would be lower. Competition from the secondary airport would lead to a welfare improvement.

3 Subsidies. When subsidies are present, competition need not be welfare improving. Subsidies induce users to choose high cost over low cost producers.

Many secondary airports have been enabled to offer lower prices through being offered subsidies by local authorities (Air Transport Group, Cranfield University, 2002). Could these subsidies be warranted? From the perspective of the local region, this could be so. Suppose that subsidies are effective in bringing more tourists to the region. Suppose further that tourism brings economic benefits- for example, a tourist may spend \$100 in the region, but the cost of supplying the goods and services consumed might only be \$900- there will be a net benefit of \$100 per tourist to the region. If subsidies to the airport succeed in attracting LCCs and more tourists, they could be in the interest of the region.

While this may be correct, there will be negative impacts on other regions. The tourists who have been attracted to the region offering the subsidies spend less in other regions, such as that surrounding the major airport. Unless this region is congested, there will be a loss of tourism benefits in this region. Using subsidies to shuffle tourists from one region to another is not a welfare enhancing exercise. What is rational from the perspective from the individual region is not taking all regions together.

4 Passenger Ignorance. Suppose that the secondary airport is located some distance away from the destination, but the main airport is located close by. Land prices in the remote location are likely to be lower, and to the extent that these are factored into the airport costs, the secondary airport will have lower costs. It can then offer a lower price schedule to the airlines. However the remote location entails higher travelling costs for the passengers. If passengers realise this, they will factor it into their assessment of the attractiveness of the LCC's product. Alternatively it is possible that passengers are not aware of the remoteness of the secondary airport, and that they would not choose to travel through it if they were aware. If ignorance is present, inefficient allocations can come about.

5 Inefficient Bypass. When a sunk cost is recovered by setting a charge equal to average cost, inefficient bypass can come about. Suppose that there is a large sunk cost associated with the construction of a major airport, but revenues must be raised to cover this cost. Suppose also that airport services can also be provided at a secondary airport, at a variable cost less than the average cost of the major airport. Under these cost conditions, it would not have been optimal to build the major airport, but

this has already been done. If the major airport is required to cover costs by setting a price at average cost, the secondary airport will undercut it, and win traffic from it. This results in an inefficient allocation of traffic, since traffic which can be handled at zero marginal cost will be handled at a positive variable cost. The bypass problem is a real one in telecommunications, and it stems from inefficient pricing of sunk assets. The problem can arise with airports too.

6 Different Asset Valuations. It is quite possible that the assets of major and secondary airports have been valued using different and inconsistent principles, and that this is leading to problems when they compete.

The major airport will often be required to cover costs, including the sunk capital costs of providing fixed assets such as the runways and terminals. When the airport is corporatised or privatised, the sunk assets will be valued, perhaps using replacement cost or some variant of it. These could be quite high valuations, and prices will have to be high to recover them.

By contrast, the asset valuations which form the basis of the secondary airports prices may have been arrived at on a very different basis. The secondary airport could well be a military airport which is no longer in use- it might have been sold to a local authority at a nominal price. The capital costs could have been more or less fully written off. Suppose the local authority wishes to recover the costs of its investment when it operates the airport as a commercial entity. It will be able to do this at a low price which does not factor in the sunk cost. Essentially, the secondary airport is able to offer services at a lower price than the major airport not because it has lower costs, but because of different accounting valuation conventions, and different requirements for cost recovery. Competition between two airports, when one is required to cover historic costs and the other is not, is bound to give rise to misallocation of traffic.

7 Differential Service Quality. The secondary airport may be able to offer lower prices to the LCC because it is supplying a lower quality of service. In particular, it may have a low cost terminal, while the major airport may have a costly, high quality terminal. If the variable costs of terminal operation are lower at the secondary airport are lower, then it is efficient for the LCC to be attracted to the secondary airport, granted that it is not prepared to pay for the higher service quality.

In the longer term, the major airport should be able to offer terminals of a quality which LCCs are willing to pay for. However, it is possible that the major airport has constructed a high quality terminal which has ample

capacity which can be used at low marginal cost. If so, it would be efficient for the LCCs to use it- however, if the sunk costs of the terminal must be recovered by high use charges, this will not happen. It will be profitable for the secondary airport to build a new low cost terminal for the LCCs- another example of inefficient bypass.

In summary, there are several reasons why a small secondary airport may be able to offer lower airport charges to the LCCs than the major airport does. It is necessary to determine exactly which of these reasons apply in a particular case. If the reason for lower charges is greater operational efficiency, it is desirable for the secondary airport to capture the LCCs' traffic. If, on the other hand, the lower charges come about because of different asset valuations or subsidies, competition between the airports will result in an inefficient allocation of traffic.

Institutional Arrangements and Airport Competition

Competition works well when all the competitors operate under similar conditions- the level playing field assumption. This situation often does not occur with airports. Secondary airports can be, but often will not be, equally or more efficient suppliers of airport services as the major airports. We would not normally expect airports, with economies of scale and significant sunk costs, to be effective competitors. When additional complicating factors, such as subsidies which are available to some though not all airports, are allowed for, it is even less likely that competition will work well. Competition between secondary and major airports is now being observed in many instances, but it cannot be concluded that it is always welfare enhancing.

The pricing structure of airports is not conducive to competition. There are large sunk costs of constructing airports, and most airports operate under a cost recovery constraint (and privately owned airports are regulated and allowed to set prices to cover measured costs). Furthermore, the cost recovery constraint is invariably set in terms of arbitrary annual terms, which mean that prices and marginal costs are driven further apart. Sunk costs are amortised- i.e., arbitrarily allocated to specific years, resulting in costs being recovered even when excess capacity is present and marginal costs are minimal. The upshot is prices well above marginal cost when excess capacity is present, and prices well below efficient rationing levels when there is excess demand. When there is excess capacity, competition does not encourage an efficient allocation of traffic between airports, and there will be too strong an incentive to use

the secondary airport. By contrast, when there is excess demand, and capacity is being rationed by congestion, there will be too weak an incentive to use secondary airports.

On top of this, the rules under which different airports operate are different. The secondary airport may be able to charge lower prices simply because it is being subsidised and the major airport is not. In other cases, the secondary airport's advantage may lie in different, and arbitrary accounting treatments of sunk assets. The sunk costs associated with the secondary airport's assets may have been written off, while those of the major airport may be required to be recovered. Under these circumstances, competition between airports will not lead to an efficient allocation of traffic.

This has implications for the way we view the role of competition between airports. When there is a natural or locational monopoly, it is often desirable to expand the role of competition where possible, to reduce the dependence on regulation, given the problems associated with regulation. Competition can sometimes be used to discipline the price behaviour of the firm instead of regulation. In the airport case, the increasing presence of secondary airports need not be disciplining the price behaviour of major airports in an efficient manner.

While competition between airports can be counter productive, it does not follow that it would be desirable to prohibit it. A preferable strategy would be to address the underlying environment as far as is possible, with a view to making competition work better. The elimination of subsidies is an obvious starting point- in this respect, the recent developments in Europe, requiring removal of some existing subsidies, are positive. It is also important to address the less apparent sources of distortion, such as the accounting treatment of assets. Ideally, secondary airports should only be in a position to offer lower prices than the major airports when their costs are genuinely lower. While much can be done to level the playing field, it will still not be level while sunk costs are recovered on an arbitrary annual basis, leading to inefficient price structures and the risk of costly bypass.

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