

**WHAT PROBLEMS WILL THE
AIRPORT BUSINESS HAVE TO
CONFRONT IN THE 1990s?**

**HOW DOES THE US AIRPORT
SYSTEM DIFFER FROM THE REST
OF THE WORLD'S?**

**WHAT PARTICULAR PROBLEMS
DOES THE BUSINESS FACE IN THE
THIRD WORLD?**

Starting from the premise that airports can be run as commercial successes, *The Airport Business* aims to place the business as a whole within a conceptual framework. The author examines the major issues facing the business throughout the world and offers an insight into how to deal with the major economic and financial difficulties that are likely to arise in the next decade.

Rigas Doganis is Professor of Air Transport at Cranfield Institute of Technology. He has extensive firsthand knowledge of air transport both in this country and in the Third World. He has acted as consultant to numerous governments, airlines and airports. He is also the author of *Flying off Course: The Economics of International Airlines*.

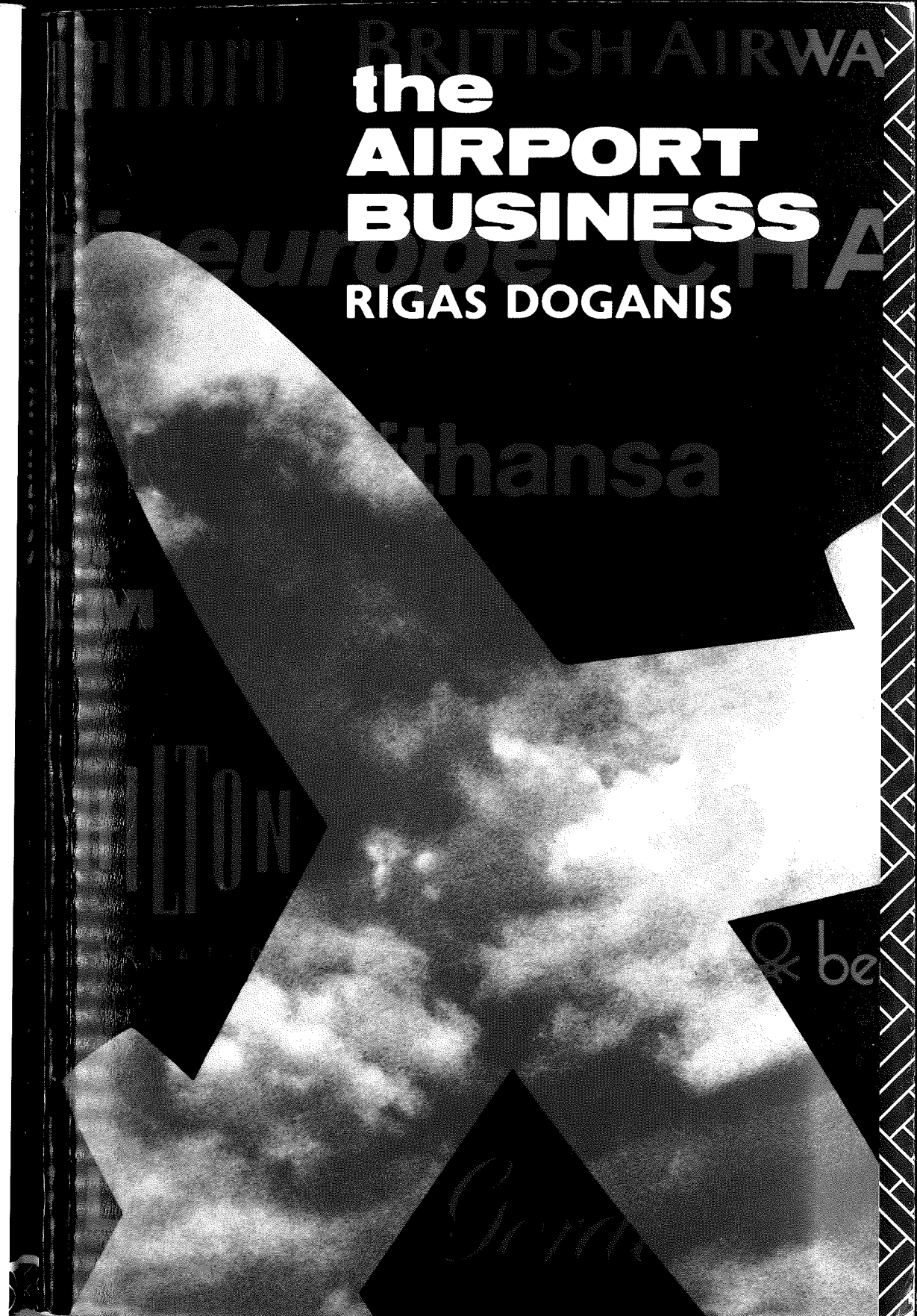
Cover design: Alan Forster

Economics/business studies/transport studies

ISBN 0-415-08117-3

 **Routledge**
Taylor & Francis Group

11 New Fetter Lane London EC4P 4EE
29 West 35th Street New York NY 10001
Printed in Great Britain www.routledge.com



First published 1992
by Routledge

11 New Fetter Lane, London EC4P 4EE

Simultaneously published in the USA and Canada
by Routledge

29 West 35th Street, New York, NY 10001

Reprinted 1996, 2000, 2002

Transferred to Digital Printing 2003

Routledge is an imprint of the Taylor & Francis Group

© 1992 Rigas Doganis

Typeset by Witwell Ltd, Southport

Printed and bound in Great Britain by

TJI Digital, Padstow, Cornwall

All rights reserved. No part of this book may be reprinted or reproduced or utilized in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

British Library Cataloguing in Publication Data

A catalogue record for this title is available from the British Library

Library of Congress Cataloguing in Publication Data

Doganis, Rigas.

The airport business / Rigas Doganis.

p. cm.

Includes bibliographical references and index.

1. Airports. 2. Airports--Management. I. Title.

HE9797.D64 1992

387.7'36--dc20

91-44797
CIP

ISBN 0-415-07877-6 (hbk)
ISBN 0-415-08117-3 (pbk)

all real costs associated with the provision of airport services, may be somewhat worse than their published financial results might indicate (See Table 1.3).

WHAT IS AN AIRPORT?

Airports are complex industrial enterprises. They act as a forum in which disparate elements and activities are brought together to facilitate, for both passengers and freight, the interchange between air and surface transport. For historical, legal and commercial reasons the actual activities within the airport for which an airport owner or manager is responsible vary between countries and often between airports in the same country. Thus the airport business can, in some instances, cover almost everything that goes on at an airport, while elsewhere it may encompass only a small part of the total airport activity.

An airport is essentially one or more runways for aircraft together with associated buildings or terminals where passengers or freight transported by the aircraft are processed. Around the world the majority of airport authorities own and operate their runways, terminals and associated facilities, such as taxiways or aprons. But there are exceptions, notably in the United States where many terminals are owned by airlines, and in France where the ground facilities are sometimes owned by the government rather than the local Chambers of Commerce who run the airports.

Within the overall airport umbrella a wide range of services and facilities are provided which can be divided into three distinct groups: essential operational services, traffic-handling services and commercial activities. By examining how these services are dealt with among European airports it is possible to assess both the range of activities that go on at an airport and the varying degree of involvement in them by airport owners.

Essential operational services and facilities

Such services are primarily concerned with ensuring safety of aircraft and airport users. They include air traffic control (ATC) services provided at the airport to facilitate the approach and landing of aircraft, meteorological services, telecommunications, police and security, fire and ambulance services including those for search and rescue, and finally runway and building maintenance.

These facilities and services are normally provided by the airports themselves or by local or central government departments. But even when the airport operator is responsible for their provision, that operator may have relatively little discretionary control over them because their provision may be heavily influenced by government policies or national or international regulations. For instance, in recent years the level of security provided at British airports has not been at their discretion but has been determined by the relevant government minister.

At the majority of European airports *air traffic control* (ATC) and the associated meteorological and communication services are undertaken by government departments. The costs of such provision are handled in two ways. First, at many airports such as the BAA airports (Heathrow, Gatwick and Glasgow), Amsterdam, Frankfurt, Geneva, Milan, Rome and Vienna the costs associated with these activities are not passed on to the airports. Nor do the airports themselves levy any charges on users for ATC, though the civil aviation authorities may do so. So there is no revenue generated for the airport. For example, though ANA, the Portuguese government body responsible for Lisbon airport, also runs the ATC services, the airport and the navigation services are kept completely separate and the airport administration itself does not incur any ATC costs or revenues. Second, at other airports where ATC services are provided by the government, the airports are actually charged for such services. They therefore include an ATC or navigation service charge in their own airport charges in order to recoup this expense. In Europe such airports include Birmingham, Copenhagen, Geneva and Manchester. Their accounts show a cost figure arising from the provision of ATC. This is also the case with a third and much smaller group of airports who operate the ATC services themselves. These include East Midlands, Jersey and Stockholm airports.

With the increase in hijacking and terrorism, *policing and security* is nowadays an airport service of considerable importance. Apart from the normal police duties required at any large public place, specialist staff are now also needed for passenger search, baggage search, access control and so on. These latter services are sometimes defined as security rather than policing activities but the distinction between the two is very blurred and so they are considered together.

Dublin is one of the few airports which provide all their own policing/security and incur all the costs. Belfast, in Northern Ireland, is similarly in charge of all these activities but subcontracts some security work to private companies. It receives grants from the government to cover the extra measures needed because of Belfast's additional security problems. At Geneva and most UK airports (except Jersey), a combination of state police, airport employees or private companies are used with the airport paying the total costs. Similarly responsibility for security rests with more than one body at Amsterdam, Copenhagen, Düsseldorf, Frankfurt and Lisbon but in these cases the state police are provided free of charge. Finally all policing/security at the French and Italian airports, at Vienna and at several other European airports is undertaken by the state with minimal or no costs being passed on to the airports.

Air traffic control services and policing/security are the major operational areas where the most important discrepancies arise in their treatment by different airports. Differences associated with the other main operational activities, namely apron services, fire and ambulance services, cleaning and

maintenance, are likely to be far less significant. Apron services such as 'follow me', marshalling, snow clearance and so on are nearly always undertaken by airport employees. Similarly fire rescue activities are provided by the airport authorities themselves at all but a few airports. At the Italian airports this service is provided free of charge by the state whilst at Marseilles, Bordeaux and Lisbon the airport authority pays for a specialist company to provide the service. The larger airports also have their own ambulance services whilst the smaller airports tend to rely on local state services. The responsibility for airport cleaning and maintenance often lies with employees of the airport authority, although the more specialist the work required the greater likelihood of these services being subcontracted out or provided by a government department.

Handling

A variety of handling activities take place at airports. Some are associated directly with the aircraft itself and include cleaning, provision of power and loading or unloading of the baggage/freight hold. This is sometimes referred to as ramp handling. Other handling activities are more directly traffic related and cover the various stages of processing of passengers, baggage or freight through the respective terminals and onto the aircraft. Various parts of the handling process may be the responsibility of different authorities.

At about half the larger European airports the airport authorities have no involvement in any of these activities, which are provided by airlines or specialist handling agents. This is the situation that exists for instance at Amsterdam, Copenhagen, Dublin, Gatwick, Geneva, Heathrow, Marseilles and Nice. The airport authorities of some other UK airports, of Bordeaux, Lisbon and Stockholm provide a limited range of handling services required at an airport.

But there are several airports that are very heavily involved in providing such services. These include Düsseldorf, Paris, Frankfurt, Milan, Rome and Vienna. At the German airports and Vienna all the ramp handling is provided by the airport authority. Passenger and freight handling is undertaken by both the airport authority and the airlines at Frankfurt whilst at Düsseldorf and Vienna the authority itself provides freight handling. Passenger handling at Vienna is undertaken by both the airlines and the airport authority (who in fact subcontract Austrian airlines to carry out some of this work). Handling at many Italian airports is provided by the airport authorities.

Commercial activities

At most of the European airports commercial facilities are provided by concessionaires, who will be specialists in their own field of business. The airport authorities will collect concession fees or rents from these companies.

But there are a few airport authorities who are themselves directly involved in running some or virtually all the commercial outlets. Aer Rianta, the Irish Airport Authority, operates the duty-free shops at all its airports including Dublin. In Rome the duty-free shop and the restaurants are operated directly by the airport authority whilst the other shops and bars (commencing in 1983) are provided by concessionaires. At Düsseldorf the airport authority only operates the duty-free shop. At Amsterdam all the catering outlets are provided by a company which is in fact partly owned by the airport authority. The only commercial service which a significant number of airport authorities provide themselves is car parking. Amsterdam, Dublin, Düsseldorf, Frankfurt, Geneva, Lisbon, Manchester, Nice, Rome and Vienna are among those that run their own car-parking facilities whilst the rest of the European airports use concessionaires to do this.

In addition to the usual shops, restaurants, bars and car-hire kiosks, some of the larger airports provide an extensive range of other services for their customers both within the terminal buildings and on airport land. The most notable example here is Frankfurt airport where the additional commercial activities include cinemas, bowling alleys, a discotheque, hairdressers, supermarkets and a conference centre and hotel. These are normally rented out as concessions.

As the above European examples show, one airport authority or operator can be very different from another and yet they are both in the airport business. Differences arise because most of the facilities and services previously mentioned may be provided by the airport operators themselves or they may all be provided by third parties, such as central or local government departments, airlines, specialist agents or private companies. Nearly every airport in Europe seems to be directly involved with a different mixture of services. At the one extreme airports such as Copenhagen, Geneva, Marseilles or Nice almost play the role of a landlord with very little direct participation in most of their airport activities. In the United States too airport authorities are largely landlords. This can be contrasted with Rome, where the airport itself provides and operates most of the facilities and services mentioned above.

The extent of an airport authority's involvement in the various functions of an airport will obviously substantially affect the cost and revenue structure of each airport. It will influence the overall employee levels just as significantly. Moreover differences between airports will be further compounded if the airport authority is not charged the full cost of any service provided by a third party. This is most likely to occur when separate government departments or agents provide some of the essential services such as policing or fire and rescue. Differences in the functions performed by the airport owner or operator clearly pose comparability problems when assessing and comparing airports. These are compounded where airport owners are conglomerates with substantial non-airport activities, such as BAA Plc or the Port of New York Authority.

from internally generated funds. Commercial loans or bonds have generally played a relatively small part in airport finance outside the United States. As a consequence of the different approach adopted to financing, many US airports find that interest paid is a major part of their annual expenditure and is a much more significant cost element than for airports elsewhere. If one adds together depreciation and interest paid one finds that capital charges represent a relatively large proportion (44 per cent) of the total costs of US airports (see Figure 3.2).

The relative importance of capital charges at US airports is reinforced by the fact that staff costs are less significant as a cost element. For example if one looks at the total costs, operating plus non-operating, of eight of the largest US airports in 1989-90, one finds staff costs at six of the nine were between 11 per cent and 18 per cent (see Table 9.6 p.201). On the other hand capital charges, that is depreciation plus interest paid, accounted for a much higher share of total costs ranging from 35 per cent at Chicago O'Hare to around 72 per cent at Atlanta, an airport heavily dependent on revenue bonds as a source of finance. For the larger US airports capital charges are generally between 25 per cent and 55 per cent of total costs, and in the majority of cases they are much higher than staff costs.

The above figures contrast sharply with the European picture (see Figure 3.2) where capital costs average around 24 per cent of total expenditure and are rarely above 35 per cent, while staff costs average 42 per cent but may climb to 60 per cent or more. Another contrast with European airports relates to maintenance and repair. Because many US airport authorities act effectively as landlords renting or leasing out land and facilities, they tend to have low direct operation costs but proportionally higher maintenance and repair costs. Certainly the latter costs as a proportion of total costs tend to be much higher at US than European airports where they average around 9 per cent.

ECONOMIC CHARACTERISTICS OF AIRPORTS

The preceding analysis is concerned with the structure or composition of airport costs rather than the level of costs. One can measure cost levels in terms of the cost per unit of output which may be a passenger or a work-load unit (WLU). Unit costs at individual airports will be influenced by a whole range of factors which will vary from country to country and between airports in the same country. Some of these factors are discussed in the later chapter on performance indicators (Chapter 8). However, detailed analyses of airport costs over many years suggest that airports as business units exhibit certain economic characteristics irrespective of their cost structure or level.

The first marked characteristic is that there seem to be significant economies of scale in airport operations. This means that as an airport increases its traffic throughput the cost per unit of traffic declines. Early studies of British airports showed that unit costs fall sharply as traffic

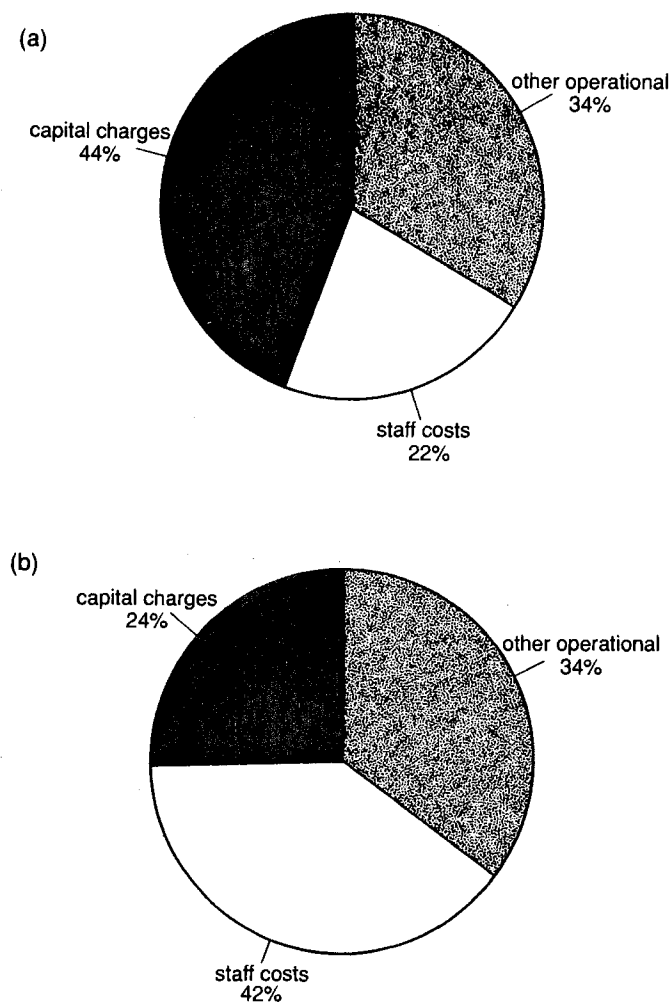


Figure 3.2 Average cost structures: (a) large US airports 1989-90; (b) European airports 1989

Source: Transport Studies Group, Polytechnic of Central London.

throughput increases, particularly up to 1.0 or 1.5 million passengers. As traffic grows beyond a level of about three million passengers, unit costs flatten out and do not seem to vary much with airport size. In economic terms the long-run average cost curve for airports takes the form shown in Figure 3.3. There is no evidence that in the long term there are any significant internal diseconomies

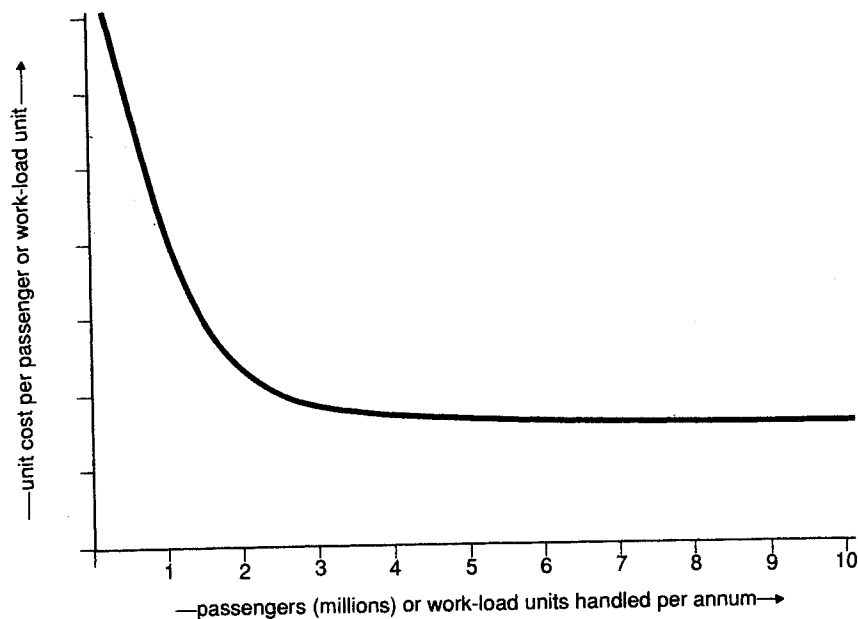


Figure 3.3 Airport long-run cost curve

of scale, as in some other industries, which would push up unit costs when airports start to get very large. There may, however, be some short-run increases in unit costs if congestion becomes excessive. In addition there may be external diseconomies in terms of noise pollution or road-traffic congestion.

The implication of all this is that smaller airports will tend to have higher unit costs. From an airport-planning point of view it suggests that concentration of air traffic within a region on a small number of larger airports will result in lower airport costs than spreading air services to a large number of relatively smaller airports, even though the latter strategy may reduce passenger access costs.

The second economic characteristic of airports is that major development programmes push up unit costs. Where airports undertake major expansion and development programmes which are too large in relation to immediate traffic needs or which are undertaken too soon, the short-term and medium-term effect is to increase their unit costs. This is not only because the airport's depreciation and other capital costs go up but also because operating costs rise. A major new terminal has to be heated, lighted, cleaned and maintained and staffed even if the number of passengers using it is well below the design capacity.

As a result unit costs per passenger rise, often dramatically, and airports having undertaken major expansion schemes often find themselves losing money. It is only when traffic builds up to make better use of the expanded facilities that profitability is likely to be restored – unless, of course, the airport embarks on a further cycle of expansion too soon. Conversely smaller airports that hold back on investment, even though they are heavily congested at peak periods, may actually achieve profitability despite their smaller traffic throughput and higher unit costs. The implications are clear. Airports should hold back investment as long as possible if they want to keep their unit costs of production low. In addition they should avoid grandiose developments which entail very large jumps in capacity in a single step. Montreal's Mirabel airport is an example of airport development on too grand a scale which has resulted in heavy financial losses. Airports by their very nature require relatively large indivisible investments in additional terminals or even runways. But where possible investment should be phased in such a way that jumps in capacity are not too large or too soon.

These first two economic characteristics of airports may appear contradictory in that there are economies of scale on the one hand, while on the other development programmes aimed at achieving these economies actually push up costs. In fact these two conclusions are reconcilable. There are a number of situations in any industry with falling long-run costs where an increase in capacity will lead to higher costs in the short term: first, if the investment in new capacity takes place too soon and demand is not in a position to grow sufficiently quickly to allow the utilization of the new capacity at a low-cost output level; second, if investments in capacity need to be undertaken in large discrete stages, implying that the short-run cost curves are far apart from each other, then the effect of a new investment programme is the same. In both cases demand or traffic throughput is too low in relation to the increased capacity to ensure low unit costs. It is clear that in many airport situations both factors often occur in conjunction. Investments are undertaken too soon and the jumps in productive capacity which result from these investments are too great. In other words there is a divergence between short-run and long-run costs.

Airports expand by building new terminals and/or additional runways. Each discrete level of capacity is represented by a short-run average cost curve as in Figure 3.4. The long-run average cost (LRAC) curve envelopes the short-run curves and is tangential to them. With one terminal and one runway the airport is operating on the first short-run average cost curve (SRC^1). As throughput increases unit costs decline until at output level Q^1 they are at a minimum. If output increases beyond this point then congestion and overloading of the terminal may lead to a slight increase in unit costs. The airport has been building a second terminal however and the short-run average costs for a level of capacity with two terminals is shown by curve SRC^2 . If the airport moves to a two-terminal operation when output is at say Q^2 , unit costs will

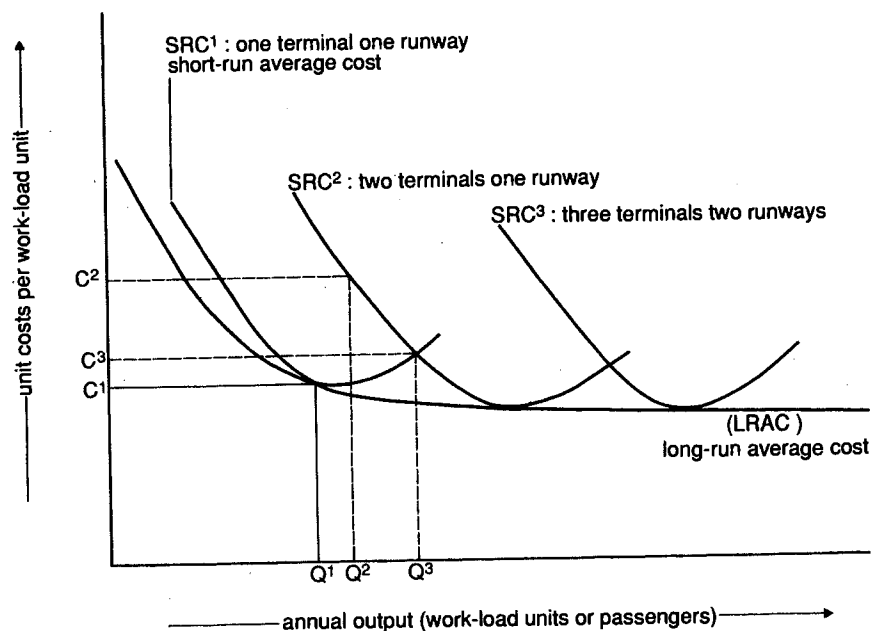


Figure 3.4 Relationship between short- and long-run average costs of airports

immediately go up from about C^1 to C^2 . They will then decline over time moving down SRC^2 as throughput grows. Alternatively if the opening of the second terminal is timed so as to coincide with output reaching the Q^3 level there will in theory be no jump in unit costs. However, in the meantime, there will have been an increasing level of congestion in the existing single terminal. As traffic expands beyond Q^3 then unit costs will gradually decline along SRC^2 to levels lower than those when there was only one terminal.

A third variable which has important repercussions on an airport's performance is the proportion of international passengers within its total traffic. This has an important effect both on an airport's cost and on its revenue levels. Unit costs increase as the proportion of international passengers increases because such passengers need substantially more terminal space for customs, health and immigration and so on than do domestic passengers and also because they spend, on average, more time in the terminal. This in turn means greater space and amenity requirements. But unit revenues increase more than in proportion to the increase in unit costs. This is not only because revenue from shops and other concessions in the terminal rises dramatically as international passenger throughput increases, but also because landing fees and other aeronautical charges at many airports are higher for

international than domestic flights. Thus the net effect is that an airport's chances of breaking into profit are improved as the proportion of international passengers in its total traffic increases. This is a major justification for airport managers to try to attract international air services.

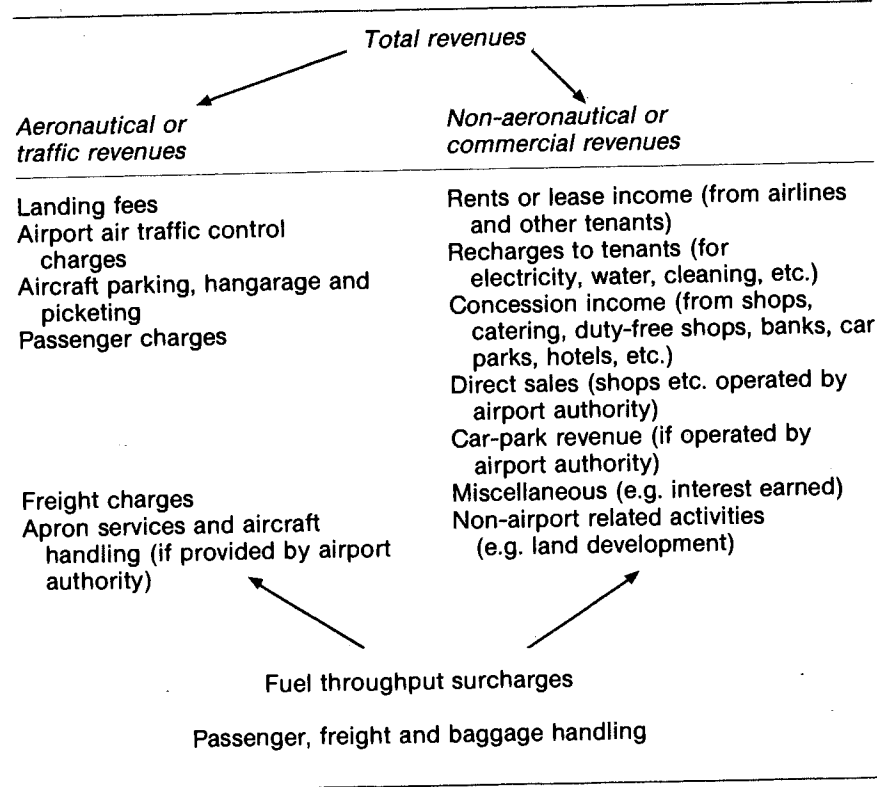
SOURCES OF AIRPORT REVENUE

Airport income is generated from aeronautical or traffic-related activities on the one hand or from non-aeronautical or commercial sources on the other. *Aeronautical* revenues are those that arise directly from the operation and landing of aircraft, passengers or freight. They include aircraft-landing fees, passenger-service charges, air-traffic-control charges if ATC services are provided by the airport authority, aircraft parking and hangarage fees, and charges related directly to the handling or cleaning of the aircraft. *Non-aeronautical* revenues are those generated from non-aircraft-related commercial activities in the terminal/s and on airport land. They may arise from a whole host of sources but generally include rents for office space and check-in desks; income from shopping concessions of various kinds; car-parking fees; recharges to tenants for services such as electricity, water and so on; and revenue from catering whether this is provided by the airport or a concessionaire (see Table 3.1). This distinction between aeronautical and non-aeronautical is not always clear cut. For instance, how should one categorize fuel charges levied by an airport on each gallon or litre uplifted? Is this a traffic-related aeronautical revenue or is it a form of concession fee? Since airports normally charge rent for land and any other facilities used by aviation-fuel companies, which would appear as rental or commercial income, then the fuel throughput charge should perhaps also be treated as a concession revenue.

The greatest uncertainty and confusion arises in relation to revenue from handling of aircraft or of passengers, baggage or freight. At most airports such services are provided by airlines or handling agents. In the case of handling agents a concession fee may be charged by the airport and revenues arising would appear as non-aeronautical. If, on the other hand, the airport authority provides some of these services itself, say freight handling, it may categorize any income earned as aeronautical. In the analysis which follows fees from handling undertaken by an airport itself are treated as aeronautical while fees earned from other handling agents are identified as commercial.

Greater uniformity among airports in the treatment of revenues means that revenue analyses and comparisons of airport revenues are likely to be more accurate than when dealing with costs. Western European airports on average generate about 56 per cent of their total income from aeronautical charges and 44 per cent or so from commercial or non-aeronautical sources. The more detailed breakdown within each of these two categories is shown in Figure 3.5. In the 1970s aircraft landing fees represented by far the most significant part

Table 3.1 Categorization of airport revenue sources



Note: ¹ Individual airports may not have access to all of the revenue sources listed.

of aeronautical revenues but during the following decade airports put greater emphasis on generating revenue from passenger-related charges. By the early 1990s aircraft-related landing fees and passenger-related charges were each producing a similar share of the total revenues. The suggestion in Figure 3.5 that handling services generate on average about 13 per cent of revenue is somewhat misleading. It is an average figure based on two extreme situations. Most European airport authorities do not themselves provide any handling services at all so no aeronautical revenue is produced from this source, while airports such as Frankfurt, Rome, Vienna or Milan that are heavily involved in handling may generate 35 to 50 per cent of their total income in this way. If one excludes handling revenues then the aeronautical revenues decline to 49 per cent of the total while non-aeronautical or commercial rise to 51 per cent. Among non-aeronautical sources, concessions generate on average the largest share of revenues. Revenues from other commercial sources are fairly evenly spread.

The revenue composition of individual airports may differ substantially

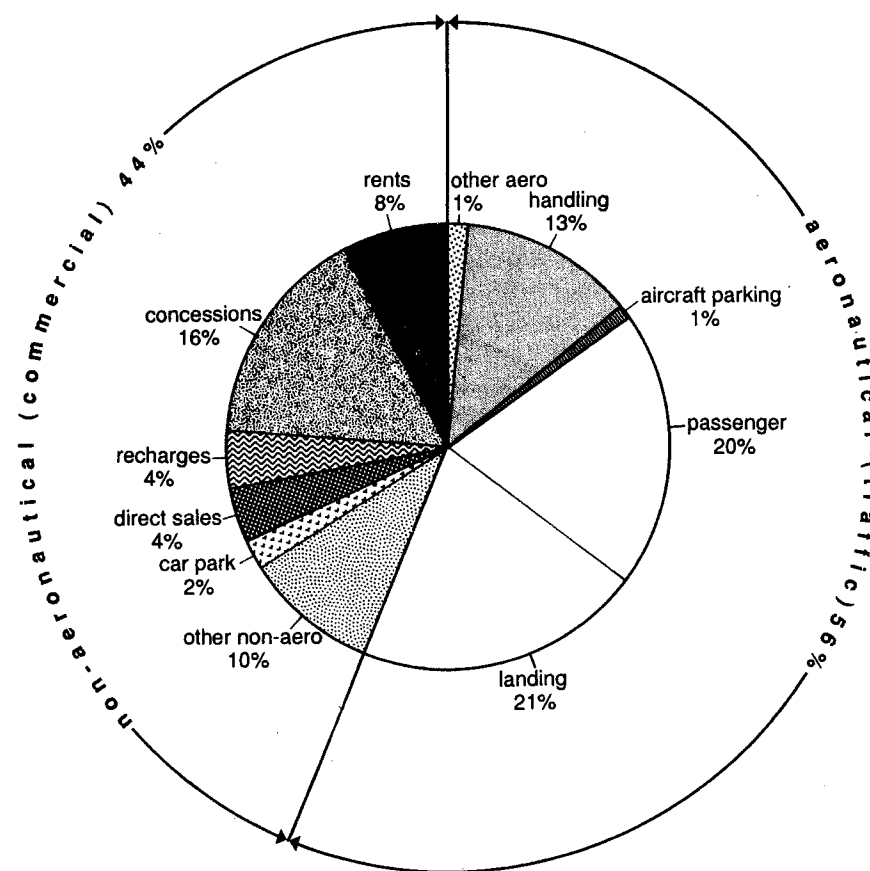


Figure 3.5 Average revenue structures among European airports 1989

Notes: ¹ Handling revenues are those arising from the provision of services by the airport authority itself.

² Direct sales revenue is from catering outlets or shops operated directly by the airport authority; only a few airports do this.

Source: Transport Studies Group, Polytechnic of Central London.

from the average break-down shown in Figure 3.5 as a result of the various factors affecting either their aeronautical or non-aeronautical revenue-generating potential. These are discussed in greater detail later on (see Chapters 4 and 6). However, there does seem to be a common relationship between airport size and revenue generation. Smaller European and other airports tend to be almost entirely dependent on aeronautical revenues which are supplemented by some rental income (see Figure 3.6). As traffic grows commercial revenues build up providing an increasing share of total revenues.

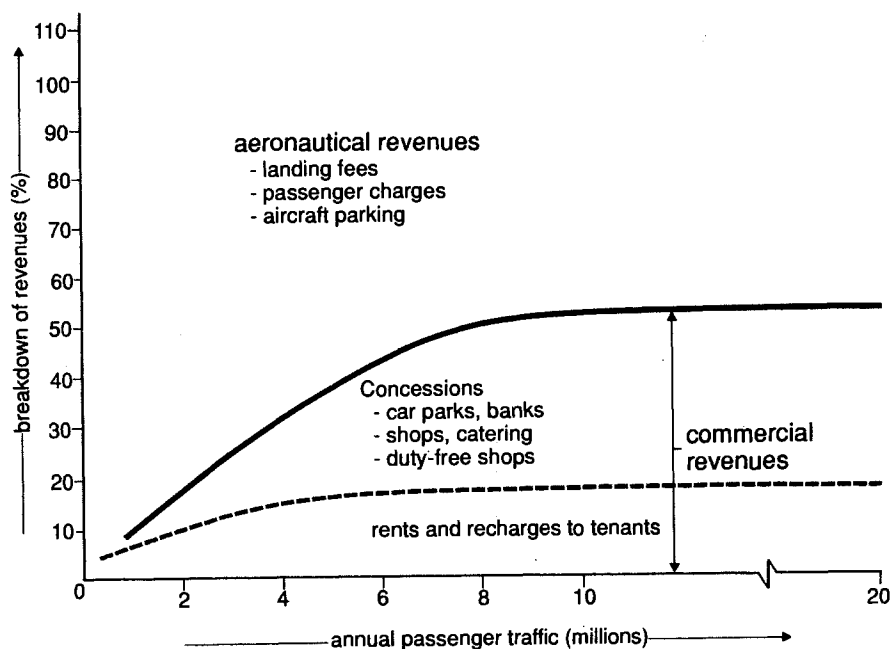


Figure 3.6 Revenue split as traffic grows among most European airports

But this growth in commercial income comes very largely through concession income arising from the expansion of shopping, catering and car-parking facilities and sales and, where available, from increased duty-free shopping. Other commercial revenues, that is rents and recharges to tenants for services provided, stabilize at around 15 to 20 per cent of total revenues. By the time airports are handling close to nine to ten million passengers or more, commercial revenues should have risen to between 50 per cent and 60 per cent of total income. For some reason, at airports outside the United States even among the larger ones this figure rarely rises much above 60 per cent.

Revenue structures of United States airports are significantly different from those of European and other airports. In contrast to the latter two groups US airports generate a much higher proportion of their income from various commercial sources. On average, around 75 per cent to 80 per cent of revenues at the medium-sized and larger-sized US airports come from commercial sources with a correspondingly small balance generally less than 30 per cent coming from aeronautical charges (see Figure 3.7). At some US airports the aeronautical charges represent little more than 10 per cent of total revenues. For example, this was the case at Los Angeles International in the financial year 1989-90 when landing and other flight fees generated only 8 per cent of

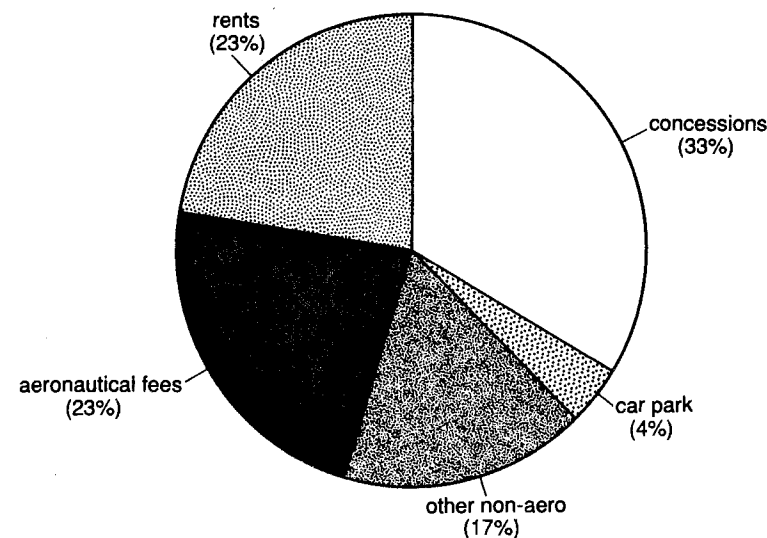


Figure 3.7 Average revenue structures of medium/large US airports 1989-90

that airport's total revenues (see Table 3.2). Until 1991 US airports were not permitted to generate revenue for themselves from a per capita passenger charge even though such a charge was widely used in other parts of the world (see pp.203-5). Thus aeronautical revenues were almost entirely composed of aircraft-landing fees. The absence of passenger-related charges is one reason why commercial revenues are so much more important than traffic or aeronautical income. Another more important factor is that the leasing out of terminal buildings, hangars and other facilities is much more widespread among US airports and is done to a greater degree than is the case elsewhere. As a result rentals and leases tend to generate a relatively high proportion of total income at most US airports. One feature particular to US airports is the very high revenues generated from car parking and from car-rental and limousine concessions. They are invariably the major single source of non-rental commercial revenue whereas among non-US airports it is normally revenue from duty-free concessions which dominates. Among US airports duty-free concession revenues are inevitably lower because for most of them international passengers are a relatively small proportion of the total. Another feature of US airports is that they appear to earn a higher share of their income from interest on short-term investments and bank deposits than do their counterparts elsewhere. The particular features of US airports discussed above can be seen by reference to one example, the airport of Los Angeles (see Table 3.2).

Table 3.2 Income structure of Los Angeles International airport (financial year to June 1990)

	(%)
<i>Aeronautical</i>	
Landing and other flight fees	7.5
Fuel commission ¹ and miscellaneous	0.6
Total aeronautical	8.1
<i>Non-aeronautical</i>	
Concession income	51.4
Rentals and lease income	26.6
Recharges for services	0.9
Interest earned	12.8
Other	0.3
Total non-aeronautical	91.9
Total income (US\$194.6m)	100.00

Source: Data supplied by the City of Los Angeles Department of Airports.

Note: ¹Fuel commission could be classified as non-aeronautical.

TRENDS IN REVENUE DEVELOPMENT

During the 1970s increasing pressure on airports to operate on a commercial basis led to a rapid increase in landing fees and passenger charges at most non-US airports. As a result, at many airports, especially those in the UK, aeronautical revenues grew faster than non-aeronautical and their share of total revenue increased. In the subsequent decade and partly as a result of pressure from airlines, the rate of increase in airport charges slowed down and there has been increased emphasis on maximizing revenue from commercial activities.

A number of airports have tried to split their costs and revenues between aeronautical (i.e. traffic) and non-aeronautical (i.e. commercial) activities despite the problems and difficulties involved in cost allocation. These difficulties in allocating costs are especially acute because so many are joint costs. This is particularly true of costs associated with passenger or freight terminals. For instance, there are many areas and facilities within passenger terminals which are used both for passenger handling and for commercial purposes such as shopping. How does one then allocate the costs of the space used, or its heating and cleaning costs, between the traffic and commercial activities? Nevertheless, the British Airports Authority (BAA) had been doing this for many years in its annual reports prior to its privatization. Invariably such analyses showed that while aeronautical or traffic revenues failed to cover traffic-related costs, commercial activities at most of the BAA airports tended to be profitable. Particularly large profits on commercial activities at