



**THE FUTURE  
OF  
INTERNATIONAL  
AIR TRANSPORT POLICY**

Responding to Global Change



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*Responding to Global Change*

# ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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## FOREWORD

International air transport is both a major industry in its own right and a provider of essential services for a wide range of business and leisure activities. It is a sector that has also been the subject of extensive regulatory controls. The world is changing, however, and with the increased internationalisation of economic activities and the expanding demands of individuals for leisure activities, most notably perhaps tourism, there is a need to deepen understanding of the role of air transport in the international economy and to review the regulatory structure which governs air transport.

That position was recognised at a 1992 conference of the OECD's Forum for the Future that set in train the events leading to the production of this study. The work itself was carried out by the OECD Secretariat and was overseen by a Steering Group whose membership (see Annex 2) extended beyond the customary involvement of high-level OECD government officials to include senior-level participants from industry and consumer groups. The industrial representation on the Group was designed to offer the broadest possible perspective on the key issues and, in consequence, included – in addition to major airlines – membership from airports, aircraft manufacturers and airfuel suppliers.

This publication brings together the analytical work conducted as a key element of the project with a list of policy recommendations. The report reflects a broad but not complete consensus among the members of the Steering Group. There was general agreement on the long-term economic efficiency gains that further market liberalisation could generate, but of course, the participants were not able to agree on all points. Indeed, the Japanese Government submitted a dissenting view (see Annex 1). The report and recommendations nonetheless carried the support of the overwhelming majority of the Group. The project was directed by Wolfgang Michalski. The Secretariat team of authors consisted of Kenneth Button, Wolfgang Michalski, Barrie Stevens and Peter Weiss. The publication is made available on the responsibility of the Secretary-General of the OECD.



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## **INTRODUCTION, EXECUTIVE SUMMARY AND POLICY RECOMMENDATIONS**

By any standard, international air transport is a large and rapidly growing industry. International airlines now account for over 1 350 billion passenger kilometers of traffic a year, and freight transported by air accounts for well over a third of the value of the world's manufactured exports. Passenger traffic has grown at an average rate of 9 per cent per annum since 1960 and air cargo by 11 per cent per annum. Without extensive air transport networks, major service industries such as international tourism would not have expanded to today's levels. International air transport has also been a major driving force behind the globalisation of production and distribution systems, and it is set to continue its important role for economic development in the future.

The international aviation sector is, however, confronted by a wide variety of challenges resulting from new economic and social trends, breaks in old trends, and new technologies. New markets are emerging and the requirements of established ones are changing. It is also a time of fresh ideas in regulatory policy and, partly related to this, the structure of the airline industry is itself undergoing important change. Strategic airline alliances have grown in importance over the past decade as carriers have sought the marketing and operational benefits of widespread market presence. The growth of aircraft leasing and the outsourcing of maintenance and other activities has, moreover, allowed easier access to some markets for smaller carriers.

The OECD Project on International Air Transport has focused on addressing some of the major challenges confronting the sector. It is a follow-up to an OECD Forum for the Future Conference on "New Policy Approaches to International Air Transport", held in June 1992. That conference sought to examine the industry's performance and long-term outlook. The objectives of this project and its resultant report are to provide governments and major players in industry with both a comprehensive picture of possible future developments in the field of international air transport, and a common assessment of the policies needed to ensure that air transport can contribute fully to the sound evolution of the OECD-wide economy and of the world economy over the coming decades.

The report shows that the airline industry is inherently flexible and that market forces can, in general, be relied upon to produce economically efficient outcomes. There is thus justification for seeking the development of a workably competitive international aviation market that operates in the interests of all. In this context, one of the roles of

government is to establish the broad regulatory framework which permits markets to function efficiently.

## **A. Executive summary of the analytical report**

Prior to presenting policy recommendations, it is important to understand fully how the international air transport sector functions. Initially, there is the question of what determines the demand for air services and what form future changes in these forces are likely to take. It is also essential to look at the supply side of air transport and to understand the ways in which government policy and the actions of air service suppliers affect the economic efficiency of the sector. From this analysis, policy must take into account the types of structural adjustment that will be required in the future to meet the new challenges and the transition options available to policy-makers.

### ***1. Globalisation of economic activities and its implications for international aviation***

The international aviation industry is an integral part of the modern, global economy, both influencing and being influenced by the pattern of economic development. It is an industry which has grown prodigiously over the past thirty years, and which has had to cope with major economic and technological challenges. There is little evidence that this dynamism is subsiding, and given the industry's position in the national and international economy, it is vital that it be enabled to respond effectively to the demands of modern industry and of consumers.

Economic growth, higher disposable incomes and increased leisure time on the demand side, combined with falling real airline tariffs and technical change on the supply side, have been important driving forces behind the long-term growth of international air transport. Indeed, air traffic has doubled in each of the past three decades, growing consistently at about twice the rate of global GDP growth. The total magnitude of growth in air traffic and its spatial variations are, however, also related to the rapid process of internationalisation of economic activities.

On a micro level, the internationalisation process is reflected in a profound transformation of corporate strategies. International sourcing of intermediate inputs and components is rapidly expanding, while corporate activity in the advanced industrialised countries increasingly tends to concentrate on higher-value segments of the production chain. Worldwide interaction of corporate activity is being organised through networks of affiliates and through non-equity arrangements such as subcontracting, franchising, joint ventures and alliances. Modern transport and information technologies play a crucial role in these developments, providing the means to synchronise and co-ordinate geographically dispersed activities.

On a macro level, owing to far-reaching liberalisation measures and technological developments, strong growth of international transactions of goods, services and capital is being observed. The conclusion of the Uruguay Round of multilateral trade negotiations

is expected to provide additional impetus to the internationalisation of economic activities by further reducing traditional trade barriers and introducing important new disciplines in the areas of services, investment, intellectual property rights, technical and safety standards, and public procurement. Similarly, the Multilateral Investment Agreement which is under negotiation at the OECD is likely to accelerate the international deployment of productive assets.

In parallel to the geographical widening and the extension in scope of trade within a global multilateral framework, countries in Europe, North America and Asia are seeking even closer economic ties via regional agreements. Though it is sometimes claimed that there is a risk of these agreements turning into protectionist trading blocs, the dominant view is that regional arrangements lend support to the multilateral system by acting as way stations to a more globalised economy. International civil aviation, while only marginally impacted by the Uruguay Round, is part of several regional agreements, the most noteworthy being the internal market programme of the European Union.

Prompted by the deepening and widening of the division of labour and the emerging pattern of economic integration as well as by technological developments, broad structural changes are unfolding which should help underpin demand for international transport and, in particular, air transport. It is expected that the expanding engagement of internationally operating corporations in the joint development and production of high technology components will boost the share of high-value/low-bulk products in international trade. In addition, the proliferation of just-in-time concepts and lean production methods will lead to a significant shortening of production cycles and increase the pressure for rapid and reliable delivery. The integration into the world economy of countries that are distant from the old industrial centres will enhance the demand for long-haul transport. The shipment of high-value/low-bulk products over longer distances, combined with a growing importance of the time factor, should give air transport a significant comparative advantage over other transport modes.

While these trends in the globalisation of production and distribution systems will have a significant impact on air cargo, passenger transport will be stimulated as well. Changes in management strategies, such as the adoption of global sourcing, coupled with improved information and communications systems, are increasing the demand for personal interaction at the international level. The rising importance of service sector activities in industrialised countries, which are more travel-intensive than manufacturing, is also enhancing demand for air services. Steadily expanding international movements of labour, in particular of expatriate personnel, will only reinforce this tendency.

A key dynamic factor which will continue to stimulate future air passenger transport will be rapidly rising levels of international tourist travel. Tourism, which already accounts for a large share of overall air travel, is expected to continue its development towards a global industry, with growth rates well above those for general world output. Tourist travel is underpinned by rising incomes, more leisure time and demographic and social factors, such as an ageing population in OECD countries, combined with declining real costs of air fares. Long-haul tourist travel will continue to increase its share in overall travel, although this growth will not be equally distributed among world regions.

While there seems to be a common understanding that the global changes under way will have a stimulating effect on air transport, much more doubt prevails when it comes to the pace, composition and geographic distribution of these changes. Systemic risks in passenger and cargo markets, together with uncertainties such as the possibility of international trade conflicts, the speed and path of technological development, or increasing global environmental pressures, could significantly alter the path of developments. For international aviation, this would have important implications for the level and pattern of both passenger and cargo markets which may prove difficult to foresee. There will also be significant regional variations in the degree and nature of the uncertainties that future global changes may produce in air transport.

A dynamic industry such as international aviation requires the ability to cope with rapidly changing markets, institutional structures and operational environments. In the past, the international aviation sector has developed a tradition of being at the forefront in the utilisation of information systems, both covering the immediate conditions within the sector and seeking to provide long-term forecasts. In both areas, the industry has relied upon internal forecasting within subsectors (*e.g.* by individual airlines and airports) and publicly available forecasts produced by, among others, international agencies and aircraft manufacturers. These forecasts have not, however, always proved to be accurate. Long-term trends have often been misread and short-term shocks not predicted. They may also not provide the appropriate types of information that modern management and policy-makers need to cope with today's issues.

Forecasting is still an art rather than a science and, as the nature of uncertainty in international aviation markets changes, projections will need to include important new elements of judgement. New important trends are occurring, for instance, in patterns of tourist demand. There are rapid developments of services in emerging economies in Asia and Latin America, while the air transport market is undergoing significant transformation in the countries in Central and Eastern Europe. Additionally, external to aviation itself, trend breaks are occurring with the developments in high-speed rail services and in telecommunications services which will increasingly impact on aviation markets. There also continue to be important technical developments within the sector, for example regarding new air traffic control technologies and the potential for much larger aircraft. The latter developments are, however, easier to foresee than changes related to market conditions for aviation services, where driving forces behind existing trends are taking new forms as markets mature.

Civil aviation is a sector involving high capital costs, particularly in the provision of infrastructure. As a consequence, inappropriate investment decisions can prove to be costly. There are, in particular, high social opportunity costs if inaccurate forecasts lead to periods of industry-wide overinvestment or underinvestment. Innate high levels of uncertainty will, therefore, require handling in a combination of ways. The existing forecasting methods will need to be developed more fully to embrace the changes that are taking place in international aviation markets. This will include not just the more widespread use of techniques such as scenario analysis and Delphi procedures, but also the appreciation that there is a need to gain a greater understanding of how the sector functions rather than the continued focusing on past relationships. Additionally, the industry itself must be permitted to develop strategies to respond flexibly to trend breaks



and new driving forces. In this context, a greater emphasis on market forces, by providing appropriate incentive structures and flexibility, offers the economic environment in which the international aviation industry has the ability to meet the challenges posed by the new uncertainties.

## **2. Government policy and the efficiency of air transport services**

The focus of aviation policy over the past fifteen years has moved from protection of existing airlines to enhancing efficiency and responding to consumer interests. This has brought two aspects of competition issues in the air transport sector to the forefront: first, competition *for* the market, relating to the conditions under which either new carriers enter the aviation market or established carriers commence air services on other routes; and second, competition *in* the market, referring to the actual conditions under which competition is conducted within the aviation market. Although the boundaries between the two notions are blurred, they can be distinguished analytically. This is the approach taken here. The two aspects are addressed in turn, focusing – especially in the light of experience with domestic market liberalisation – on the underlying structural features of, and their consequences for, competition policies relating to the international air transport market.

Traditional economic theory points to the desirability of perfect competition – with markets working effectively, entry and exit taking place without hindrance, information being ubiquitous, and constraints on the availability of inputs absent. The idea of unrestricted entry is of particular relevance because this is in theory supposed to ensure that only the most efficient producers will remain in the market-place. More recent has been the theory of contestable markets, which argues that, even if no actual entry occurs, the very threat of entry can discipline, albeit to a lesser degree, the behaviour of incumbents. In the case of the international aviation industry, however, neither the notion of perfect competition nor that of contestability has proved fruitful.

More realistic in the international aviation context is the notion of workable competition, whereby the number of actors, though small, may be large enough to ensure competition among incumbents, and entry of new suppliers is possible without prohibitively high costs. Although such a market falls short of the ideal of perfect competition or contestability, it could perform sufficiently well to ensure that existing operators are stimulated to minimise the costs of providing services, to tailor their services – including fare structures – to the needs of customers, and to adopt new technologies. Under such circumstances, the role of governments would be to ensure that the conditions needed to create workable competition are attained, and that divergencies in legislation do not substantially distort competition.

International aviation involves a variety of entry and exit issues. Some of these may reflect the intrinsic nature of industry (*e.g.* the extent of market failure) but, perhaps more importantly, others stem from the current regulatory regimes (intervention failure). What emerges is that even with extensive liberalisation the sector is unlikely to function as a perfectly competitive or contestable market. The challenge is to minimise artificial barriers to entry and exit and to ensure that those remaining do not result in unfair

competition. This must also be done in the context of maintaining high safety standards and ensuring the attainment of wider social goals such as the protection of the environment or the provision of adequate transport for remote communities.

The cost structure of the industry is complex, involving, in varying degrees, potential economies of size, scope, density, standardization and experience. Incumbents may have some natural advantages over potential entrants, but they are the type of advantage that incumbents in many other industries enjoy. The issue is not that impediments to entry are problems *per se*, but rather that those players already in the market should not be allowed to exploit their position to a degree that deprives the public of the benefits of workable competition. The types of economic regulatory issues that result are, however, similar to those found in other sectors involving high cost of capital and indivisibilities. Strategies to deal with such imperfections are well established. On the basis of economic arguments there seems to be little reason to take regulation beyond these confines in international aviation.

The reactions of incumbent airlines to entry and the threat of entry, through their pricing and capacity decisions and through the adoption of marketing devices such as frequent flyer programmes, are an almost inevitable consequence of opening markets. Incumbents act to protect themselves against entry by both new carriers and, more often, by established carriers seeking to serve other markets. The vast majority of these reactions are legitimate elements of a competitive response. A small number may reflect attempts to create artificial deterrents to entry although, with the spreading of the liberalisation process, their influence tends to become weaker as potential new entrants are better able to produce counter-strategies, for example interchangeable frequent flyer programmes. There remains, however, a need to preserve the potential for introducing specific policies limiting or prohibiting demonstrable anti-competitive actions by incumbents. Various issues relating to, for example, computer reservation systems have already been tackled or are being tackled at an international level.

Airlines may also act to increase their market power by means of their pricing policy or their service levels. This type of strategy is not unique to the international aviation market, and is usually covered by general competition policy. It is, nevertheless, an extremely difficult issue to handle, given practical problems of distinguishing anti-competitive practices from justified commercial responses to new market conditions. If in specific cases anti-competitive behaviour is suspected, the burden of proof should lie with the surveillance authorities.

There is a trend for airlines, either for reasons of profit-seeking or as a means of enhancing efficiency, to increase their market presence. This may be through mergers or through the formation of marketing alliances including code-sharing. While these efforts are generally beneficial to airlines and consumers, under conditions of limited entry they may pose a risk to competition that supervisory authorities might take into account. Strategic airline alliances, for instance, often allow improved interlining and scheduling together with benefits of interchangeable frequent flyer programmes, but may also hold the potential for market dominance.

One of the difficult issues associated with new airline entry and incumbent growth concerns the high costs and indivisible nature of accompanying infrastructure. In light of

existing bottlenecks, expanding overall infrastructure capacity is frequently a prerequisite for coping with increasing traffic volumes. Given past experiences and the complexities of the planning processes, however, there are doubts as to whether currently proposed infrastructure investments in the OECD countries and elsewhere will be fully realised. Even if they are realised, it is clear that this would not mean surplus capacity – and air traffic congestion would continue to pose severe problems in many parts of the world.

In addition to building more facilities, capacity can also be enhanced by increasing efficiency in the operation of the existing infrastructure. There are moves afoot to improve airport management and the technical efficiency of the physical infrastructure. Progress has been made at some airports, for example, by basing the allocation of runway capacity on economic criteria and by the removal of restrictions on access to ground handling. In general, however, current pricing of air transport infrastructure is rarely economically efficient, and suppliers of various airport-related services continue to be confronted with physical, regulatory and other impediments.

Access to air transport infrastructure is an issue as important as capacity itself. For workable competition in aviation services, it is important that terms of access to and use of infrastructure are fair for all competitors. The fees levied on the use of infrastructure and access conditions affect the terms upon which airlines compete. At present, there is evidence that some markets are being adversely influenced by variations in such things as handling charges, lack of access to competitive ground handling services and the allocation of landing slots. New entrants, in particular, can be affected by restrictions in access to infrastructure, especially since liberalisation may add to infrastructure congestion.

Aviation is a sector which poses a variety of environmental, safety and security challenges. As in other sectors, there are good economic reasons for internalising the environmental and safety costs of aviation through either fiscal or regulatory policies. The danger is that unless the policy is directly related to environmental costs, environmental policy can affect the basis of competition between airlines and between airports. Equally, there is a need to ensure that appropriate measures aimed at safety and security in international air transport are efficient, cost-effective and continually reviewed.

Most governments also intervene directly to influence the nature of competition in international aviation markets. Bilateral air service agreements (ASAs) were designed to permit, on the basis of equal opportunity, direct involvement of all countries in international air transport; they stipulate the nature of competition in terms of the airlines that can participate, the capacity that may be provided and the degree of collusive activity allowed. In many cases these agreements have now become less restrictive, and regional arrangements have brought substantial liberalisation within their scope of application. In addition, as aviation networks expand, air transport users have an increasing choice of routings and service attributes which circumvent particular bottlenecks.

Regulations governing ownership can also impede entry of competitive carriers, but changes are gradually taking place as rules on ownership are eased and privatisation occurs. There are also interventions through the provision of subsidies and other forms of government-controlled financial support. However, these measures are often not clearly targeted, so that their implementation frequently means that their economic objectives are not achieved. Hence, although there is change, institutional constraints limiting the extent

of genuine competition remain. Many international markets are still highly regulated, governments continue to intervene directly in the market process, and exit of inefficient airlines is frequently prevented.

### **3. Challenges of restructuring and transition**

Structural adjustment is concerned with the way an industry adapts its sourcing, production and distribution to changing economic, technological and institutional conditions so as to contribute to the overall efficiency of the economy. While traditional economic theory has tended to assume that such adjustments can be made quickly, and do not involve any transaction costs, in practice these costs influence the speed of structural change.

Such costs can be reduced or minimised where there is a general economic and social environment that is conducive to investment, innovation and structural adaptation. This implies at the macroeconomic level the enhancement of sustained, non-inflationary growth; at the mesoeconomic level well-functioning product, labour and capital markets; and at the microeconomic level assurance of constant, primarily market-induced flows of resources from less to more productive activities.

International air transport faces challenges for change from three directions: first, from the evolution of demand, where new driving forces and potential trend breaks undermine the continuation of past trends; second, from the supply side, where new products, technology shifts and modern management techniques require new approaches; and third, from the regulatory environment, where many governments are contemplating major institutional reforms, either in terms of modifications to the old regimes (*e.g.* more liberal bilateral agreements) or relating to new frameworks (*e.g.* multilateral or regional arrangements).

For air transport service suppliers, meeting these challenges requires considerable adaptability of operating capacity, workforce and organisational structures. The chapters that follow emphasize that a move towards more liberal markets involving freedom of entry and exit, a well-functioning price mechanism and the absence of artificial capacity restrictions could give international aviation the flexibility it needs to restructure in response to changing economic, technological and regulatory conditions. More explicit consideration is given here to the ways in which institutional factors may inhibit restructuring of individual companies and the sector as a whole.

The existing situation involves different starting points around the world. There are, for instance, considerable differences in the efficiencies and sizes of individual airlines; regulatory regimes differ across countries and markets; and access to infrastructure varies. Some of these differences reflect inherent comparative advantages; others stem from distortions due either to market imperfections or to institutional arrangements. Such differences are likely to affect airlines' ability to handle structural change. They may also influence the speed of the process of structural change. The situation is compounded by the capital-intensive character of the aviation industry and its financial structure (*i.e.* high levels of sunk costs). For policy-makers, the challenge is to decide to what extent, if any,



these variations should be taken into account in making decisions on the institutional arrangements for the international air transport sector.

Further issues involve the difficulties arising from the current availability and allocation of infrastructure, which affect airlines' abilities to meet emerging patterns of demand and minimise their own operational costs. International aviation relies heavily on both airport facilities and air traffic control and navigation systems. The structural adjustment process may be impeded by inadequacies in the level of the physical infrastructure available as well as by technical and economic inefficiencies in its utilisation.

A number of institutional factors also influence the type and pace of restructuring. Apart from the effects of air service agreements, ownership rules can act as an impediment in the transformation process. In many instances, structural adjustment can be eased if it is accompanied by a change in the ownership of airlines, especially the transition from the public to the private sector. Unduly strict investment limits, including restrictions on ownership, can reduce the degrees of flexibility available to airlines and limit the availability of funds for the financing of structural transformation. Ultimately, these obstacles may slow the pace of the adjustment process and lead to inefficient company structures and distortions in markets.

There are also institutional issues related to competition policy. Problems can arise in particular from a lack of transparency with regard to competition rules. Additionally, differences in competition policies and a lack of compatibility between the substantive rules and enforcement practices among OECD countries may act as institutional impediments to the restructuring process.

Restrictive institutional arrangements governing air transport will inhibit the restructuring process, thus preventing the sector adjusting to ongoing dynamic changes in the economic, social and technological environment. In general, the analysis suggests that government intervention in the sector should be limited to the application of competition laws (*e.g.* general policies applied to matters such as mergers, and aviation-specific policies relating to such issues as computer reservation systems), consumer protection, enforcement of environmental, security and safety regulations, and ensuring the provision of adequate services for social reasons. Other forms of government intervention will almost certainly have implications not only for the air transport sector but also for other parts of the economy.

Much of the difficulty inherent in the adjustment process results from variations in air carriers' ability to compete in a market-based environment, which in turn stems partly from the institutional framework in which they have developed. Differing initial positions will clearly influence which transition strategies are most likely to be effective. These transition strategies can include a number of individual topics, such as ways to develop or restructure air service agreements and allocate infrastructure capacity. ASAs are the cornerstone of the existing regulatory framework. Although transition strategies can also include radical changes in the system, such as the rapid adoption of a liberal multilateral structure, the transition costs associated with radical reformulation of the system, combined with political reality, make a gradual approach involving a combination of measures at bilateral, regional and multilateral levels the only realistic option.

It is important that the distributional implications inherent in any change of regulatory regime are fully recognised. In certain cases, a government may deem intervention necessary to alleviate the consequences for those negatively affected by the transformation process (*e.g.* in terms of job losses or a considerable worsening of working conditions) in order to make the necessary changes politically feasible and socially acceptable. Care must be taken, though, that such intervention does not significantly restrict the overall benefits of the reform. Excessive control over change may significantly dilute the potential economic gains of restructuring to the sector, with wider consequences for global economic expansion.

The institutional framework in which international aviation functions is a complex and interactive one, and it is important that other aspects of the sector's regulatory structure be reviewed as well. Transition may also, for example, involve other types of institutional change that can be made separately from changes in ASAs. This can include changes regarding airline ownership requirements, competition policy, subsidies, and infrastructure access. The institutional reforms should be consistent across the range of issues being addressed, and they should be mutually reinforcing. The position of non-OECD countries can also be important, and changes within the OECD should ideally take into account the need for transition arrangements which allow other countries to become more fully involved.

## **B. Policy recommendations**

The basic aim of policy development in international air transport should be to ensure that international aviation contributes fully to the sound economic development of the OECD area and of the world economy at large. On the basis of the analytical chapters that follow, a strong case can be made for seeking to establish, in the broadest terms, aviation markets characterised by workable competition. This concept allows for the maximum possible use of competitive processes while acknowledging the role of the government in establishing the rules of the game and the general regulatory framework for markets to function properly.

Against this background the following courses of action are recommended.

### ***1. The process of liberalising international air transport should be further continued***

An important means of attaining the objective described above is the further liberalisation of the international air transport markets. Liberalisation in terms of capacity freedoms, fare freedoms and market access freedoms has gradually been taking place within the existing bilateral agreements and in the framework of regional groupings, but given the challenges confronting international aviation, further development and extensions will be required.

### *1.1. Bilateral air service agreements should be further liberalised*

At the global level, the institutional setting for international aviation is predominantly bilateral. This system has shown its practical strength and flexibility, but its functioning could impede the development of the sector in the long run. While there is a case for moving towards a liberal multilateral regime, the reality is that this is unlikely in the short and medium term. Hence, the further evolution will be mainly based on the bilateral system.

It is, therefore, recommended that:

- The process of liberalisation regarding capacity, tariffs and market access be further encouraged.
- There should be greater transparency in bilateral agreements. In particular, the use of confidential agreed minutes should be minimised.

### *1.2. Regional and plurilateral agreements should be deepened and widened*

Regional agreements on international aviation markets have emerged as part of a general expansion of geographical economic groupings. They have permitted a number of countries with similar interests to remove many of the restrictions on market entry to international aviation within their markets, and have allowed freer competition between their airlines. This process could be developed by a further deepening and widening of these agreements.

It is, therefore, recommended that:

- Continued efforts be made, through processes of policy co-ordination, mutual recognition and harmonization, to enhance liberalisation within regional and plurilateral agreements.
- Efforts be made for a linking up of the different regional and plurilateral agreements, and for the initiation of a process of policy convergence between regional structures.
- Regional and plurilateral agreements in the field of international air transport be, whenever appropriate, open to enable those countries that are not part of regional groups to be associated with them.

## **2. *Competition policy should be applied as consistently as possible to international air transport***

International air transport markets, like any other markets, can be subject to market imperfections and anti-competitive conduct. National competition laws and policies need therefore to be applied to prevent excessive restrictions and distortions of competition. At the international level, the policy challenge is to ensure that differences in competition laws and enforcement standards do not substantially distort competition. In the longer term, it would be desirable that such differences gradually diminish with the convergence of legislation.

### *2.1. The application of general competition policies is to be promoted*

All OECD countries have general competition policies which would normally be adequate to handle any imperfections also in the market for international air transport services. As for other industries, general competition laws have in principle the flexibility needed to take account of the specificities of the air transport sector.

It is, therefore, recommended that:

- International air transport be treated within the general framework of competition policy. The sector should, wherever possible, be subjected to national or, where relevant, supranational competition laws controlling cartels and other anti-competitive agreements, as well as mergers and abuse of dominance.
- Competition rules normally be enforced by the national or supranational competition authority. In cases of overlapping jurisdiction between several authorities, they should seek without delay consistent analytical approaches and remedies.
- Air transport-specific policies only be implemented in exceptional and clearly defined circumstances and, whenever possible, within the framework of general competition policy.

### *2.2. In the longer term, international convergence of general competition policies is to be welcomed*

Governments differ in their approach to and intervention in competition policy. As with other internationally operating sectors, such differences may impose transaction costs on airlines and, ultimately, on consumers.

It is, therefore, recommended that:

- The process of convergence of national competition policies and enforcement practices, which is already under way in the OECD area, continue. Care should be taken that convergence is towards an adequate standard.
- The lack of convergence of competition rules not be used to prevent other measures related to liberalisation in international air transport from being enacted.

### **3. *Privatisation should be fostered and restrictions on foreign ownership gradually loosened***

The nature of ownership can influence the efficiency of an airline and affect the operational and financial options open to it. State-owned carriers are more prone to government interference in their day-to-day operations, a situation which can weaken the market stimulus to act commercially. Additionally, state ownership can make an airline's long-term planning the subject of political rather than economic and financial criteria. Reliance on national capital markets or on government sources for funding reduces the range of possible finance open to an airline.

### *3.1. Privatisation of airlines should be encouraged*

In a commercial environment, private ownership of international airlines has generally proved economically more efficient than state ownership. Private ownership offers a more flexible framework within which structural adjustments may be made and may, in particular when there are severe governmental budgetary constraints, provide for wider access to sources of additional finance. It provides for clearer managerial objectives and less opportunity for political interference in a carrier's operations.

It is, therefore, recommended that:

- The movement to more private ownership of international airlines be encouraged.
- Privately owned carriers be enabled to act as commercial enterprises without government interference in their management.
- Where airlines continue to be state-owned, they should be required to operate on a fully commercial basis.

### *3.2. Restrictions on foreign ownership of airlines should be relaxed*

Although there has been a gradual relaxation of rules, many countries maintain limitations on foreign investment in and control of airlines. These restrictions can impede the long-term restructuring of the sector, restrict adequate financing, and (thereby) adversely affect the efficiency of airline services. Ownership can also be used as a device to protect national carriers. While innovations of code-sharing and other forms of alliance can circumvent some of these problems, the option of greater foreign ownership can further enhance the flexibility of airlines.

It is, therefore, recommended that:

- Restrictions on foreign ownership and control of international airlines be gradually reduced.
- The necessary steps be taken to ensure that such changes do not facilitate the emergence of flags of convenience.

## ***4. Subsidies and other forms of financial support should, except in special circumstances, be ended expeditiously***

Direct and indirect subsidies can distort markets and reduce managerial incentives. In some very exceptional instances, primarily for political or social reasons, governments may validly provide temporary subsidies to facilitate structural adjustment. There might also be a case for ongoing subsidies to meet social needs and to ensure, for instance, adequate provision of essential services. When subsidies to more essential services are provided, the approaches that are taken should minimise market distortions and ensure that subsidies are used effectively.

#### *4.1. State aid to facilitate structural adaptation of air carriers should be strictly limited*

Parts of the international airline market are characterised by high levels of direct and indirect subsidies which have led to market distortions. Such aid should be discontinued. To permit workable competition to emerge in previously highly regulated markets, some governments may insist on providing transient subsidies for a finite period to permit efficient restructuring. Such subsidies may be deemed necessary to make structural change politically feasible and socially acceptable.

It is, therefore, recommended that:

- Policy be aimed at the removal of all direct and indirect subsidies to airlines.
- Where subsidies are given for purposes of assisting in industry restructuring, their aims should be clearly established. Subsidies should be accompanied by restrictions limiting their market-distorting effects. They should be rigorously assessed, transparent, fully monitored and phased out according to a clear and predetermined timetable.
- Methodologies be developed which would provide a clearer picture of the existing and foreseeable potential distortions associated with subsidies and other forms of publicly controlled financial support.

#### *4.2. When ongoing subsidies are given for essential services they should be on a clearly defined basis*

There may, in exceptional circumstances, be an economic justification for subsidising some international air transport services. These would relate to the provision of essential services. Where possible, subsidies should be avoided even in these conditions, but where they are given the subsidy regime should be designed to maximise the efficiency of the services offered.

It is, therefore, recommended that:

- Where subsidies are given to meet social needs, their specific objectives and justification should be transparent.
- Subsidies for international social services should be awarded on the basis of an internationally competitive tendering system.
- Tendering procedures and specifications not be biased in favour of certain carriers.

### **5. Air transport infrastructure should be used efficiently**

The existence of infrastructure bottlenecks is one of the most serious impediments to the efficient functioning of the international aviation sector. While it is essential that airports and air traffic control systems are managed as efficiently as possible, it is equally important that adequate levels of appropriate infrastructure are provided if the future challenges posed by international air transport are to be met. Efficiency can also be impaired if there is discrimination in carriers' access to infrastructure.

### *5.1. Air transport infrastructure capacity should be managed efficiently*

Efficient management of air transport infrastructure requires clear objectives and monitoring. Access to private sector funding may provide a flexible source of financing and imposes a well-established commercial discipline. Appropriate economic pricing of infrastructure should be deployed with the aim of signalling commercial needs and priorities to market participants. It is important that decisions are made on the best possible information and that all, including environmental, costs and benefits are considered. Appropriate new technologies should be introduced as soon as is practically possible to help ease the problems of air traffic control systems in OECD countries.

It is, therefore, recommended that:

- Resources for infrastructure investment be available on a basis comparable to other sectors and, in particular, access to private financial markets be permitted to provide wider sources of funding for air transport infrastructure.
- Investment decisions in air transport infrastructure, while taking full cognizance of all private and social costs and benefits, be expeditious and investments be cost-effective.
- A clear distinction be made between genuine user charges and indirect taxation. Within this framework, beneficiaries of airport and air traffic control and navigation systems should be charged according to full-cost, economic principles.

### *5.2. Access to international air transport infrastructure should be non-discriminatory*

Infrastructure capacity is limited, and access to it affects the terms of airline competition. Unequal opportunities for access can impede effective entry and can distort competition among airlines. There should be no discrimination in access to air transport infrastructure and especially airport facilities. This should apply to matters such as slot allocation and ground handling.

It is, therefore, recommended that:

- Mechanisms be introduced at airports to ensure that market entry by carriers is not unduly hindered.
- The development of secondary slot trading and other market-based allocative mechanisms be explored.
- All forms of discrimination in the use of airport infrastructure be discontinued and anti-competitive practices (*e.g.* relating to ground handling) be abolished.

## **6. *Environmental and consumer protection as well as safety and security should be enhanced***

Users of international airline services are increasingly being confronted by a variety of often complex information sources, presented in diverse ways. For liberal markets to work effectively, potential users need access to adequate and unbiased information. There may also be uncertainty among consumers with regard to airline responsibility for baggage losses, accidents and delays. Further, there is a role for governments in continuing to develop and co-ordinate environmental, safety and security policies.

### *6.1. Consumer information and protection should be enhanced*

The international air transport sector is rapidly developing: new forms of alliances, in particular code-sharing agreements, are being established; marketing and distribution systems are changing; services provided and associated fares are becoming more diversified. To benefit fully from these developments in international aviation, information and protection of consumers should be enhanced in relation to such things as delays, baggage loss or denied boarding.

It is, therefore, recommended that:

- Efforts be made to ensure that consumers can easily acquire clear information concerning the various services provided and the associated fares.
- Consumers be fully informed about details of the services, including the name of the operator effectively providing the service and stopovers or transfers to another aircraft.
- The responsibility towards the customer for any flight be clearly defined, customers be fully informed about their rights, and airline liability for legally recoverable damage not be limited as long as it reflects genuine loss.

### *6.2. There should be continued international actions to ensure that international aviation is safe, secure, and not excessively environmentally intrusive*

International air travel has steadily become safer. Nevertheless, there is a need to ensure that, wherever possible, the accident risk rate is continuously reduced. Equally, aircraft have become increasingly quiet and generally less polluting while improvements in air traffic control, combined with developments in airport design and operations, have made them less environmentally intrusive. Like other sectors, however, international air transport still impinges on the environment.

It is, therefore, recommended that:

- Policy measures continue to ensure that high standards of safety and security in international aviation, including leasing, be maintained.
- Effective policies be developed to foster environmental protection to the extent that the resulting benefits outweigh any adverse implications for airline operations.
- International harmonization of environmental and safety standards in the field of air transport be further encouraged, in particular under the auspices of ICAO.

### *7. Further international policy dialogue supported by analytical work would be useful*

Implementation of the recommendations for creating an environment of workable competition in international air transport will take time. Further, the fact that market conditions vary and evolve and new technologies emerge means that the conditions for attaining workable competition will change. Progress towards the attainment of such a competitive framework may be enhanced by a continuing policy dialogue.



*7.1. Policy dialogue at the bilateral level should be supplemented by multilateral dialogue*

There are many dimensions to the successful development of international air transport policy. While the bilateral and regional structure of the existing system has still scope for further development, the growing importance of international air transport in a globalising economy may also be fostered by enhanced dialogue at the multinational level.

It is, therefore, recommended that:

- Appropriate multilateral avenues of policy dialogue be considered in order to foster co-operation in the future development of international air transport policy. As concerns the OECD, use should be made of its comparative advantage with regard to capacity for interdisciplinary analysis and experience in developing and testing new concepts for international economic policy. Of particular relevance in this context is OECD's ongoing work on structural adjustment, regulatory reform and competition policy.

*7.2. There is the need for improved data collection and dissemination*

The development of international air transport policy can be advanced by a better understanding of the underlying nature of the sector and by a fuller appreciation of the implications of policy reforms. To achieve this, appropriate information and data are an important prerequisite.

It is, therefore, recommended that:

- More complete and systematic data be collected on international aviation markets to allow for improved analysis of international air transport markets, and to permit a more fully informed debate on air transport policy.



## GLOBALISATION OF ECONOMIC ACTIVITIES: TRENDS AND PROSPECTS

### 1. Globalisation of economic activities

International air transport has been, and will continue to be, profoundly influenced by the globalisation of economic activities. Income and trade are important determinants of overall air traffic growth but the structure of the industry is also influenced by a variety of other economic, social, geographical and political factors. A consideration of the longer-term development of international aviation requires an understanding of the complex set of factors which influence its scale and structure, together with projections of future trends in key determinants.

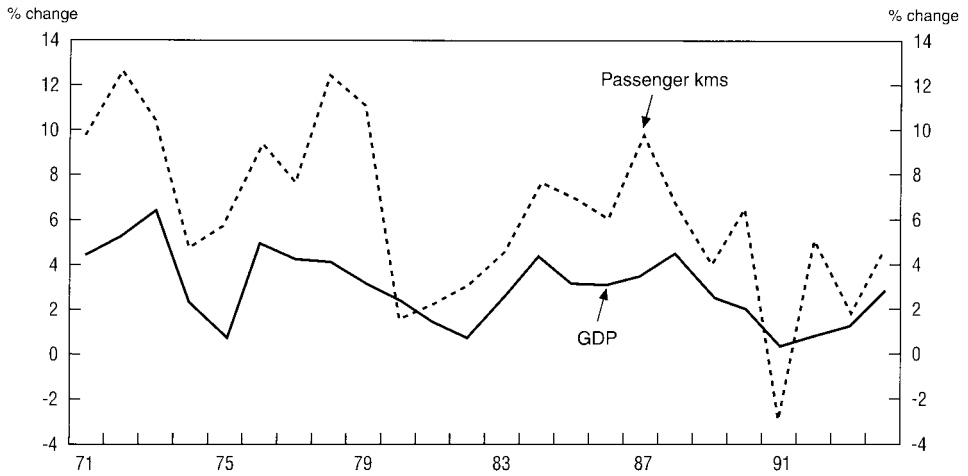
#### *Aggregate trends in the world economy*

In the past, income growth has been a key factor in determining the growth for worldwide air services. Figure 1 shows the high correlation between global GDP growth and the growth of the world air passenger traffic. It also shows that both the level and the variance of the growth of air passenger traffic has been consistently higher than that of income growth. With income being of crucial importance for the demand of air transport, any analysis of the developments in and projections relating to the civil aviation sector will, therefore, have to take account of changes in income at a global, regional, and national level.

Table 1.1 shows real output growth in the OECD area and in major OECD countries during 1960-95 along with projections up to 1997, while Table 1.2 presents figures for GDP growth for selected country groupings from 1966 to 1995. Over the past thirty-five years, average annual GDP growth in the OECD area has been around 3.5 per cent, with growth in the United States and OECD Europe slightly below and in Japan significantly above that value. Table 1.2 shows that the industrialised countries have seen only average growth while developing countries in East Asia and, to a lesser degree, in South Asia have been the growth poles of the world.

One of the main catalysts for growth was a rapid expansion of the volume of international trade. This was driven by rapid developments in information, communication and transport technologies, but also by a significant reduction in trade barriers. Real

Figure 1. World passenger kms and GDP growth



Source: OECD.

Table 1.1. GDP growth in selected OECD countries (1960-1997)

	Average 1960-93	Real GDP growth			
		1994	1995*	1996*	1997*
United States	2.9	4.1	2.0	2.3	2.0
Japan	5.9	0.5	0.9	2.2	2.4
Germany	3.0	2.9	1.9	0.5	2.4
France	3.4	2.8	2.2	1.0	2.4
Italy	3.6	2.2	3.0	1.7	2.3
United Kingdom	2.2	3.8	2.4	2.2	3.0
Canada	3.8	4.6	2.2	2.1	3.4
OECD Europe	3.1	2.4	2.7	1.6	2.7
Total OECD	3.5	2.9	1.9	2.1	2.5

\* Estimates and projections.

Source: OECD.

Table 1.2. **Growth of real GDP in selected country groupings**

	1966-73	1974-90	1991-93	1994	1995*
Industrial countries	4.8	2.8	1.2	3.0	2.5
East Asia and Pacific	7.9	7.9	8.7	9.7	9.2
South Asia	3.7	4.9	3.2	5.7	5.5
Latin America and the Caribbean	6.4	2.6	3.2	4.9	0.9
Eastern Europe and Central Asia	7.0	3.3	-9.0	-8.4	-0.7
Middle East and North Africa	8.6	1.4	3.4	2.1	2.5
Sub-Saharan Africa	4.7	2.2	0.6	1.7	3.8

\* Estimates and projections.

Source: World Bank.

exports of goods and services of OECD countries grew by an annual rate of 6 per cent between 1960 and 1993, almost twice as fast as production (Table 1.3). Between 1981 and 1993, average annual growth of world merchandise exports was 5.4 per cent. Again the developing countries of East and South Asia scored much higher growth rates than the industrialised countries and other developing countries.

While income and trade are important determinants of the overall growth of the air transport industry, the form of the industry, its geographical concentration and operational structure are also strongly influenced by the globalisation of production and distribution systems. An important aspect of this evolution is the significant increase in international ownership of productive assets. Over the past fifteen years, flows of foreign direct investment have grown at roughly four times the rate of output growth. While cumulative flows of worldwide foreign direct investment reached \$250 billion in the 1970s, this figure more than quadrupled in the 1980s (OECD, 1995a).

Table 1.3. **Growth of real exports of goods and services for selected OECD countries**

	Average 1960-93	Real export growth			
		1994	1995*	1996*	1997*
United States	5.9	8.3	8.3	7.7	8.0
Japan	9.6	4.5	5.0	5.2	7.5
Germany	5.6	7.5	3.8	5.3	6.9
France	6.3	6.0	5.9	1.6	6.6
Italy	6.9	10.9	11.1	3.4	5.7
United Kingdom	4.0	9.0	5.7	5.0	6.1
Canada	6.6	14.2	11.8	7.1	7.6
OECD Europe	5.6	9.0	6.6	4.7	6.6
Total OECD	6.0	8.2	7.7	6.3	7.3

\* Estimates and projections.

Source: OECD.

This brought the worldwide stock of foreign-owned productive assets to \$1.7 trillion, more than three times the level at the beginning of the 1980s. At the beginning of the 1990s, some 37 000 transnational corporations (TNCs) controlled about 200 000 foreign affiliates worldwide, employing about 73 million persons. It is estimated that one-third of world output is now being produced by TNCs (United Nations Conference on Trade and Development, 1994). TNCs have played a leading role in the unprecedented expansion of international transactions by establishing integrated, international production networks providing the scope for the increased international specialisation of the production of goods and services.

The globalisation of the market-place affects both the input and the output side of the production chain. Management techniques and commercial practices are thus increasingly oriented towards the marketing and selling of products in international markets. New technologies and work practices have helped establish complex, international networks in almost all areas of corporate activity, dividing the production chain into discrete functions and locating them where they can be carried out most effectively. This can be seen, *inter alia*, in the ratio of foreign to domestic sourcing which, over the last decade, has been rising in all but one of the major OECD countries (Wyckoff, 1993). At least 50 per cent of all imports by major countries are now accounted for by sourcing for further local assembly (OECD, 1994a).

To compete in international markets, companies increasingly need technological sophistication, maximum flexibility, customised products and extensive supplier networks. Assisted by modern information and communications technologies, this is often attained by establishing a network of affiliates operating on a global scale, but recently a number of other forms of cross-border co-operation such as international subcontracting, franchising, licensing, joint ventures, R&D alliances and other forms of co-operation agreements have become increasingly important. The rapidly rising number of such flexible international inter-firm relationships seems to be the most noteworthy development of late in the process of globalisation (OECD, 1992a).

### ***Globalisation as a deepening process***

A precondition for the emerging, integrated international production and distribution system was the liberalisation of trade in goods and services, of movement of capital, and of financial markets. The GATT has been the backbone of the multilateral approach to trade liberalisation. Successive GATT rounds succeeded in reducing traditional trade barriers such as tariffs and quotas, with average tariff rates for manufacturing goods in OECD countries, which amounted to between 15 and 20 per cent in the early 1950s, falling to less than 10 per cent in the early 1970s and to under 7 per cent by the beginning of the 1990s. The emergence of other non-tariff barriers, such as the manipulation of technical standards, led to their inclusion in the Tokyo Round negotiations of the GATT between 1973 and 1976.

The Uruguay Round and the establishment of the World Trade Organisation (WTO) have been the response to the trading problems presented by the internationalisation of economic activities. In particular, emphasis has been put on a major scaling back of

non-tariff barriers and the scope of liberalisation policy has been extended to agriculture, textiles and services (including parts of international aviation) and to measures pertaining to trade-related investment and intellectual property rights and to public procurement. There are now also clearer rules and standards and strengthened dispute settlement procedures under the WTO (General Agreement on Tariffs and Trade, 1994a).

Capital market and services liberalisation efforts (*e.g.* the OECD Codes of Liberalisation of Capital Movements and Current Invisibles), as well as technological developments, have extended the scope of international transactions in capital and services. The process of globalisation of the world economy owes much to the liberalisation of financial markets since they provided the low-cost financing options needed in the worldwide, large-scale restructuring of productive assets. At the same time, barriers to trade in services have been rapidly eroded through advances in transport, including aviation, and in information and communication technologies. As a consequence, trade in services has become the most dynamic element in world trade, growing at 7.7 per cent per year between 1980 and 1993 compared with 4.9 per cent for merchandise trade (World Bank, 1995). At the beginning of the 1990s, services also accounted for more than 50 per cent of OECD countries' FDI outflows.

The main thrust of the services revolution is the rapid expansion of knowledge-based services, the efficient provision of which has become essential for corporate competitiveness. The increased possibilities to separate business services such as accountancy, computing, inventory management, quality control, marketing, advertising and distribution from the production process and the subsequent outsourcing of these services have led to a vigorous development in production and trade in this area.

The deepening of international economic relations brought about by global business approaches has important consequences for the international trading system. First, an increasing proportion of trade takes place within related firms. About one-third of world trade is estimated to be intra-firm trade and 80 per cent of royalties and fees for licences are paid on an intra-firm basis (Vickery, 1993). Second, intra-industry trade accounts for a large and growing share of overall trade in manufactures. At the beginning of the 1990s, intra-industry trade represented between one-half and three-quarters of the trade of OECD countries. Increasingly, growth of intra-industry trade results from trade between affiliated firms or from global production and supply networks between independent, but co-ordinated, firms. Third, as firms in industrialised countries focus more on smaller but higher-value segments of the production process and rely increasingly on international sourcing for intermediate inputs, the composition of international sourcing is shifting from primary commodities to intermediate products. As a consequence, over the last two decades the share of intermediate products in total manufactured imports of OECD countries has been constantly rising (Wyckoff, 1993).

### ***Globalisation as a widening process***

One of the main developments in the international trading system has been the integration of an increasing number of countries into the world economy. This is, in part, the result of developing countries realising that inward-looking policies sheltering their

domestic economies from international competition do not maximise long-term economic growth. While the success of East and South-East Asian countries in embracing aggressive outward-oriented strategies is well documented, other countries have not always been as successful. One advantage enjoyed by the South-East Asian economies was that they initiated change during the boom years of the 1960s and early 1970s while elsewhere liberalisation tended to come later (Krueger, 1992).

Another important group emerging in the trading system consists of former member countries of the Council of Mutual Economic Assistance in Central and Eastern Europe. Reform efforts in these countries have been severely impeded because of a lack of institutions necessary for the functioning of a market economy and perhaps also because liberalisation and integration were initiated at a time when the world economy was in one of its worst postwar recessions. In several of the central and east European countries, however, the privatisation and liberalisation programmes have started to pay off in terms of strong output growth, and trade integration has evolved rapidly.

As a result of the successive waves of countries integrating themselves into the world economy, the boundaries distinguishing industrial from developing countries have become blurred. Several East and South-East Asian economies as well as some Latin American countries have become important players on the international trade scene. With GDP growth rates well above those in industrialised countries and a large share of world foreign direct investment flowing in, the importance of these countries in the global economy has significantly increased. The share of Asian countries in world exports, for example, has increased from 19.1 to 26.3 per cent between 1983 and 1993 (General Agreement on Tariffs and Trade, 1994*b*). Equally, the more advanced CEECs may also rapidly join the mainstream of the world economy, as liberalisation and externally oriented reforms continue.

### ***Globalisation and regional integration***

In parallel with the increasing global interdependence, several important regional integration agreements have been reached. In Europe, the Single Market programme of the EU has contributed to the liberalisation of movement of goods, services, capital and labour. In North America, the creation of the North American Free Trade Agreement (NAFTA) established a free trade zone, basically in manufactures and agricultural products, but also in some services industries. In Asia, an initiative was taken to deepen integration in ASEAN through the ASEAN Free Trade Agreement (AFTA), and there is increasing momentum in Asian Pacific Economic Co-operation (APEC).

As these regional agreements are, at least partly, intended to strengthen the competitive position of the member countries *vis-à-vis* third parties, the question arises as to whether regional agreements may lead to hostile trade blocs, which could undermine the efforts and results of the multilateral trading system (Devos, 1995). Due to their diversity, however, the impact of these regional agreements is difficult to assess. In addition, as the majority of regional arrangements are recent, knowledge of their effects is limited. Moreover, as regionalisation of trade is also observed in Asia and in Latin America, where until now no significant regional integration agreements have come into force



(OECD, 1994*b*), it will be difficult to distinguish between the effect of regional agreements and more general developments in international trade.

The general conclusion is that regionalisation has been proceeding on a par with the development of the global economy, and regional integration agreements have not impeded the continued efforts of a multilateral liberalisation of trade (OECD, 1995*b*). On the contrary, as successive rounds of multilateral negotiations have lowered trade barriers on a broad front, the relative importance of additional regional preferences has been substantially reduced. In addition, it is often argued that multilateral liberalisation may follow out of regional integration. As regional and multilateral trade problems are usually similar, regional groupings which enable deeper liberalisation over a broader range of policy areas can act as a testing ground for the design of codes and procedures in areas not adequately covered by global multilateral rules.

### ***Higher degree of international specialisation***

The synergy of regional integration and the deepening and widening of the division of labour combine to produce a fourth dimension of global change. Over the past decade, non-OECD countries' exports of manufactures have increased significantly. This shift largely reflects the fact that countries in East and South-East Asia are concentrating their exports in medium and high technology products. As a consequence, intra-industry trade, which previously occurred only within the OECD, is increasingly also characterising trade between OECD and non-OECD countries.

Companies operating globally increasingly subcontract intermediate product components to specialised firms often located in the country of assembly. In the case of high technology components, they now often develop and produce them in joint ventures in countries which are most effective in their production. Experiences of the automobile and automotive parts industry (Smeets, 1993; OECD, 1992*a*), the clothing industry (OECD, 1994*a*) and the consumer electronics industry (OECD, 1994*c*) serve to illustrate these developments.

While a few decades ago the world car market was primarily confined to North America and Europe, today strong positions have been taken by relatively new producers, initially by Japan but more recently by other East Asian countries. As a reaction to this new competition a wide-ranging restructuring process has been initiated, resulting both in a substantial relocation of production facilities and in complex international networks of equity holdings and other arrangements to produce common vehicles and components. A characteristic feature of new production methods is the outsourcing of a substantial part of the manufacturing of components. A result has been the introduction of just-in-time systems for the supply of components, reducing the need for automakers to maintain extensive inventories and, through the resulting specialisation of suppliers, increasing their ability to respond flexibly to changes in consumer demand (Ryan, 1994). Another effect has been the internationalisation of part suppliers, leading to a reduction in the number of suppliers and the standardization of components.

A further industry where the deepening of the international specialisation has become particularly visible is clothing. As each stage in the production of clothing uses

different proportions of labour and capital, activities have been separated and located in different sites to minimise costs. Important changes in consumer demand, in particular greater awareness of product variety and quality, have altered purchasing orders of retailers. As a consequence, the viability of clothing manufacturers increasingly depends on their ability to deliver on a just-in-time basis. While small and medium-sized companies reacted by adopting flexible production methods adapted to shorter production runs and shorter production-delivery cycles, larger enterprises concentrated on product lines offering economies of scale and, at the same time, increased subcontracting to minimise direct labour costs and capital requirements. This favours domestic manufacturers, because of their shorter delivery times, but the concentration in the retailing sector has also increased overseas sourcing when delivery times are not crucial or when labour cost savings are large enough to outweigh higher transport cost.

Globalisation trends are also seen in the consumer electronics sector. This industry is characterised by an extensive network of relationships linking the major companies but also – through the introduction of digital technology merging computing, communication and video functions – by an increasing number of corporate alliances across industries. A series of component production facilities and/or international purchasing offices have been established so that components can be procured from those countries where production is most efficient. A typical Japanese consumer electronics company could buy resistors made in Korea, condensers in Taiwan, transformers in Hong Kong, magnetic heads and integrated circuits in Malaysia and TV cathode-ray tubes in Singapore and assemble these parts in Malaysia for markets in Asia, the United States or Europe. Geographical specialisation by product lines is a further feature of the industry. Commoditised items, such as radios, which require a standardized technology and large amounts of labour, are produced in developing countries such as Malaysia, Thailand and (recently) China, while more high technology and high-value-added products, such as large-screen TVs, are manufactured in developed countries.

### ***Globalisation and international air transport***

Many of the tendencies observed in the process of globalisation are illustrated in the air transport sector. A proliferating variety of co-operation arrangements such as commercial, marketing and technical alliances and franchising agreements, but also a rising number of international mergers and acquisitions, are increasingly characterising the industry. Airline companies have also been internationalising their operations by, for example, outsourcing functions like accounting and data entry or the contracting out of maintenance work to suppliers abroad. International aviation, however, is not only responsive to changes in the global economy – it also plays a role in shaping the nature of these changes. It is often the availability of suitable air services which allows the exploitation of the comparative advantages enjoyed by regions. Similarly, access to high-quality international communications can be important in determining the location of modern industry.

While difficult to assess quantitatively, changes in production, trade and investment arrangements have significantly increased the need for international communication and

the shipment of commodities, thereby providing a growing impetus to international business travel and the transport of freight by air. It is estimated that up to 40 per cent of air passenger travel is for business purposes and that business travellers account for up to one-half of airlines' income. It is, therefore, plausible to assume that a significant share of the growth in international air passenger travel from 620 billion to slightly over 1.4 trillion revenue passenger-kms between 1980 and 1995, and the income generated therefrom, is due to increased business travel. Over the same period, air freight transport increased from 37 billion to 100 billion revenue tonne-kms, now accounting for well over a third of the value of the world trade in merchandise. Estimates by the International Civil Aviation Organisation (1994a) suggest that each 1 per cent increase in world exports produces a 1.5 per cent increase in the demand for cargo services.

As to the impact on the structure of air transport, the increased global network structure of corporate activity, a geographically more dispersed pattern of FDI flows and the participation of a growing number of players in world trade can be expected to lead to a faster rise in international air transport compared to domestic air transport. A similar effect can be expected from the tertiarisation of international trade since the service sector tends to be relatively more transport-intensive than the manufacturing sector (Diamond and Spence, 1989). Confirmation comes from the fact that domestic air passenger transport stagnated over the period 1988-94, while international air passenger transport grew by an annual rate of 6 per cent. Similarly, over the past two decades long-distance air transport has increased its share of total air transport with average passenger trip length increasing by 43 per cent (Rodrigues, 1993). Finally, the high growth rates of the countries of South-East and East Asia have led to strong growth of international air traffic involving the Asia/Pacific region, raising its share to over 30 per cent of the global total, compared with less than 25 per cent twenty years ago.

Among the developments highlighted in the previous section, several might be viewed as having an ambiguous effect on air transport. For instance, since a significant share of the international deployment of production facilities occurs because companies want to be close to consumers, a dampening effect on transport could be presumed. Similarly, the creation of regional agreements between geographically adjacent countries might favour short- and medium-distance transport, at the expense of long-distance transport for which civil aviation has a comparative advantage. While the need for transporting final products might diminish under such circumstances, it is likely that business travel would have to increase due to the relocation of company staff and because of additional travel for co-ordination purposes. In addition, even if in some industries assembling, design, marketing and similar functions are increasingly located close to actual consumer markets, this is outweighed by rapidly rising international trade flows in components and intermediate products.

One aspect of the globalisation process which might significantly impact on civil aviation is the substantial increase in international labour movements. Immigration of workers into OECD countries has been rising and between 1983 and 1994 the inflow of foreign workers in Western Europe significantly increased. Furthermore, a substantial share of foreign labour is made up of employees working on temporary assignments. Such labour movement not only leads to a direct increase in business travel but also gives rise to significant travel to visit relatives and friends. Although no hard data are available,

figures from the UK immigration office illustrate the fact: between 1979 and 1994, the number of arrivals of foreign workers residing in the United Kingdom who had temporarily left that country for non-business purposes steadily increased from about 800 000 to almost 1.5 million per year.

Another extremely important aspect of the internationalisation process is the growth in international tourism. Tourism is one of the fastest-growing industries worldwide; over the last two decades tourist arrivals have been growing at an annual rate of 5 per cent, and tourism receipts (excluding transport) have been rising by 15 per cent per annum (World Tourism Organisation, 1994). Not all regions in the world have, however, benefited to the same extent from this trend. While Europe and the Americas have experienced significant losses in their market shares of international tourist receipts since 1960, the East Asia/Pacific region was a major beneficiary, increasing its market share from 2.8 per cent in 1960 to more than 15 per cent in the 1990s.

There are many factors shaping the strong growth in tourism demand, the most important of which is the general rise in levels of income. Hours of work per person have also generally been continuously decreasing with shorter weeks, longer holidays, earlier retirement and delayed entry into the workforce. Demographic changes – especially the ageing of the population in many OECD countries (OECD, 1994*d*), but also a higher average age of women at the time of the birth of the first child – are important factors explaining tourism activity. The combination of higher income and increased leisure time generates synergy effects in the leisure travel market which add to the importance of air transport (World Travel and Tourism Council, 1993). The result, while there are important geographical variations, is that there has been a steady growth in tourism with significant effects on the demand for air services.

## **2. Outlook for world production and trade**

### *Prospects and uncertainties*

Medium- and longer-term projections of world economic development (*e.g.* World Bank, 1996; DRI/McGraw-Hill, 1995) show a favourable picture, with an annual growth in world GDP generally expected to be about 3.5 per cent – somewhat higher than the rate at which the OECD is expected to grow (OECD, 1995*c*). The medium- and longer-term prospects are mainly dominated by the catching-up process of many non-OECD countries. For example, annual output growth in South and East Asian countries is projected at 6 to 8 per cent during the next decade. Under the assumption of a continuation of policy reforms, growth forecasts for the Latin American countries and the countries in central and eastern Europe are also optimistic, with average growth rates projected at 3 to 5 per cent.

A key assumption underlying these projections is the development of international trade. Annual world merchandise trade promises to grow at around 6 per cent over the next ten years, with somewhat higher rates for South and East Asia and slightly lower

rates for the OECD area. A crucial element will be the trade integration of non-OECD countries, which will be substantially faster than during the 1970s and 1980s. As a result, the share of non-OECD countries in world merchandise trade is expected to rise from about 25 per cent in 1994 to more than 30 per cent by the year 2005.

An important element in the projections for world trade is the assumption that the implementation of the Uruguay Round will bear fruit, in the form of continued trade liberalisation, and that international integration will be speeded up in terms of trade, investment and technology transfer. Under these conditions, it is estimated that the Uruguay Round will accelerate world trade growth by between 0.5 and 1.5 percentage points a year (Francois *et al.*, 1995) and add about 1 per cent to world GDP (OECD, 1993a).

There are, however, a number of uncertainties which could have an important impact on the level and distribution of output growth and on the volume and direction of world trade and investment. Although globally beneficial for long-term growth, greater trade liberalisation will increase the pressures for structural adjustments in OECD countries. There is a risk that interest groups might try to slow down this adjustment process by calling for protectionist measures. This is all the more likely as emerging economies are progressively competing in sectors regarded as sensitive in the industrialised countries. Trade conflicts among OECD countries could also be a source of friction and, if not contained through international co-operation, could result in increased protectionism and the weakening of the multilateral system.

More generally, there is the inherent risk that regional agreements could turn into hostile economic blocs using their bargaining power to gain unilateral concessions from third countries (Andrieu *et al.*, 1992). Such power play could seriously undermine the operation of the multilateral system and lead to the establishment of a series of discriminatory bilateral agreements between blocs. The likelihood of such conflicts might induce business to adopt globally suboptimal strategies by directing capital flows on the basis of market access rather than efficiency considerations.

Further uncertainties involve the speed and path of technological developments and the different effects this will have on various countries; the system impact of potential instability of financial markets; possible slippage in the economic reforms in the emerging economies but also in industrialised countries; mounting global environmental pressures; political conflicts, particularly in the successor states of the USSR and in the Arab world (Michalski and Andrieu, 1992; Andrieu *et al.*, 1992).

The considerable influence on eventual growth and trade outcomes that changes in key variables may have is aptly demonstrated by the scenarios developed by the Netherlands' Central Planning Bureau. These show that under plausible favourable conditions world output could increase by 3.6 per cent per year until 2015, while under less favourable but equally plausible conditions a much lower annual growth rate of 2.2 per cent would be achieved (Central Planning Bureau, 1992). Given the close links between economic growth and the performance of the air transport industry, such uncertainties must weigh heavily in any assessment of the industry's long-term development.

### *Qualitative trends and their implications for air transport*

One likely trend is a continued increase in trade and investment flows within and between regions. This is being underpinned by further trade liberalisation as well as continued moves towards regimes which liberalise and protect investment (see, for instance, the recent progress made at OECD on the Multilateral Agreement on Investment). The trend will be further strengthened by the way TNCs organise production. The need to acquire a strong position in regional markets will call for the establishment of production sites and distribution networks inside the confines of regional zones. Production within regional areas will thereby tend to concentrate on the assembly of components, subassemblies and kits, while the production of components and intermediate goods will increasingly be organised globally. As a result, comparatively more final goods will be traded within regional zones. In addition, with the integration of geographically dispersed countries into the world trading system, inter-regional trade flows will also become more dispersed and the average distance over which goods are traded is likely to increase. This is demonstrated, for example, by the steep increase in trade between the newly industrialised countries in South-East Asia and OECD Europe.

As production continuously shifts towards goods with higher value content, the use of new and lighter materials, and the miniaturisation of components, the material intensity of production is expected to decline. Indeed, over the last two decades, the material intensity has fallen at a rate of 0.6 per cent per year in the OECD countries. The share of transport costs in the overall value of internationally traded products is therefore being lowered. As shown by Anderson (1983), for high-value-added industries such as electrical and electronic machinery, instruments and machinery, transport costs play only a minor role in the overall cost of the products. As a consequence, there will be a shift towards higher-value products in the volume of overall trade. Evidence of this shift is that the share of commonly defined high-value product categories in the overall trade of the OECD countries has risen over the past decade. These are the types of goods for which international aviation often has a comparative advantage.

With the advent of lean production methods, economising on time and inventory holding is often more important than direct cost savings. Time precision will, therefore, become increasingly important for international trade, in particular for intermediate goods – which form part of just-in-time production chains – and for spare parts. Suitable access to air transport services is thus an important consideration for many industries when deciding upon the details of suitable production sites. In the case of electronics, for example, where overall transport costs amount to only 3 to 4 per cent of production costs, immediate proximity to an airport is a key factor in plant location. More generally, firms engaged in high technology industries seek reasonable access to international aviation facilities, both for the movement of personnel and the ability to fly in components when other forms of transport encounter problems (Button, 1988).

An important aspect of the deepening in the division of labour is the increasing services-content of production. Due to the rapidly growing importance both of knowledge and technology, and of the expanding possibilities of outsourcing services-related activities, a progressive dematerialisation of production is taking place. In addition, modern information and communication technologies have led to an increased tradability of

services. As liberalisation of trade in services has only recently come under the purview of trade negotiations, most of the past rapid growth in services trade has to be seen as a result of the extensive liberalisation of capital transactions, the modernisation of financial instruments, and the use of modern information and communications technologies.

It can be expected that, with the coming into force of more extensive liberalisation measures for trade in services in the framework of the GATS and of regional agreements such as NAFTA, the current trend will become more accentuated. A strong growth potential exists for trade in services such as accountancy, data entry, engineering design and software development. As services industries also tend to be travel-intensive, the growth in international provision of services may have a significant impact on the demand for air services.

With higher income, greater mobility and more extensive flows of information, consumer tastes are becoming more differentiated and, at the same time, international. As a consequence, an increasing demand for overseas products and, in particular, for perishable goods such as exotic or seasonal plants, fruits and vegetables can be observed. New types of perishable goods are therefore likely to be increasingly traded across borders. The longer the distance these products are transported, the greater will be the likely role of civil aviation as a transport mode.

The continuing globalisation of the tourism industry is also deemed to have profound effects on air transport. Forecasts by the World Tourism Organisation, taking into account the forecasts of several other bodies, suggest that tourism arrivals will almost double between 1990 and 2010, corresponding to an annual average growth rate of 3.5 to 4 per cent. With tourism being a major industry – travel account receipts represent about 5 per cent of the OECD countries' exports of goods and services (OECD, 1994*e*) – this will have a major impact on the demand for air services in the coming years. Significant disparities between different regions will, however, have to be taken into account. While tourism growth in Europe will be slow, growth rates for East and South Asia are expected to lie significantly above average (World Tourism Organisation, 1994).

Long-haul tourist travel, in particular, is a rapidly growing industry involving an ever-greater number of countries. The increasing freedom to travel to and from countries formerly subject to important restrictions, the creation of a seamless global transport system, the decline in air fares and the continuing forces of demographic changes (*e.g.* the ageing of the population, the increase in a well-educated, prosperous and well-travelled middle-aged population) are expected to lead to increased demand for exotic, cultural and other newer forms (*e.g.* ecotourism) of tourist travel. It is also expected that the more traditional annual vacation trip is being supplemented by more trips of a shorter average duration. All these factors will, in the coming years, combine to make tourism a rapidly expanding industry for which aviation is an important transport mode.





## CHANGE AND UNCERTAINTY IN INTERNATIONAL AVIATION

### 1. The current world air transport market

Future developments in the structure of the international air transport sector will be greatly influenced by the globalisation of production and distribution systems. The future volume of air traffic and the size of the airline industry will, however, also be impacted by other social and economic factors. It is notoriously difficult to predict future growth in incomes and the future patterns of trade, and there are equal uncertainties about the longer-term trends in the other factors that influence the air transport market. An important challenge for those concerned with international aviation is that of being able to handle successfully the various types of both existing and newly emerging uncertainties which confront the sector.

#### *International passenger aviation*

The civil aviation sector now produces globally over 2.3 trillion revenue passenger kilometres a year. Scheduled services were provided by 360 international airlines serving 650 airports. Historically, the air transport industry grew particularly rapidly in the 1960s and early 1970s – on average by 14.4 per cent per annum in terms of passenger revenue kilometres – but growth was slowed by the first and second oil crises. Expansion, albeit at a slower rate of 6 to 7 per cent per annum, then returned in the 1980s. The economic recession of the late 1980s and early 1990s substantially slowed growth, with 1991, the year of the Gulf War, witnessing a contraction of the industry. Traffic has begun to expand again as the recession ended, attaining 7 per cent in 1994.

Within the overall pattern of development of the passenger sector, two specific features can be discerned (Table 2.1). The first is the strongly declining share of domestic air traffic in the world total. From being over half of the world total in 1985, domestic traffic declined to 42 per cent of the total in 1994. A portion of this decline is due, however, to the sharp drop of domestic air transport in the states of the former Soviet Union. The second is the small share of charter traffic in the world total. Despite a significant percentage increase in charter traffic from 1985 to 1995, this remained a relatively small market.

Table 2.1. **World air passenger traffic in 1994**

	Domestic	International	Total
<b>Scheduled</b>			
Passenger kms (bn)	953	1 139	2 092
Percentage of world	41%	49%	90%
Annual change 1994/1985	2.3%	7.6%	4.8%
<b>Charter</b>			
Passenger kms (bn)	25	216	241
Percentage of world	1%	9%	10%
Annual change 1994/1985	16%	1%	2%
<b>All services</b>			
Passenger kms (bn)	978	1 355	2 333
Percentage of world	42%	58%	100%
Annual change 1994/1985	2.5%	6.2%	4.5%

*Source:* ICAO.

There are important variations between different regions in the importance of traffic. North America (predominantly United States domestic traffic) is the largest region with 34.6 per cent of world traffic, but this only covers the scheduled operations of the IATA airlines. Scheduled services in Europe account for only 7 to 8 per cent, but when European inclusive tour charter operations are added, total traffic in Europe is more than doubled. Taken together with traffic on the North Atlantic route (13.9 per cent of world scheduled traffic), the total traffic involving the European/North American region is well over 60 per cent of world air traffic. Traffic involving the Asia/Pacific region accounts for over 30 per cent of the world total. Transpacific routes represent the fastest growing international market, with rapid expansion also being seen on the Europe-Asia/Pacific routes (Table 2.2).

Table 2.2. **International traffic by market sector**

Sector	Scheduled passengers carried Thousand/Actual 1992	Average annual growth % 1982-92
<b>Atlantic</b>		
North Atlantic	35 425	8.0
Mid-Atlantic	2 350	5.0
South Atlantic	2 130	7.2
<b>Pacific</b>		
Transpacific	16 154	8.6
<b>Europe – east and south</b>		
Europe-Asia/Pacific	14 738	11.4
Europe-Africa	9 399	0.9
Europe-Middle East	6 485	6.9

*Source:* ICAO.

## ***Freight and mail traffic***

Air cargo transport is growing rapidly to meet the needs of new production methods, changing patterns of industrial location and different product mixes. The nature of the goods for which air cargo has a comparative advantage, namely high-value/low-bulk commodities, means that aviation is inevitably taking an increasing share of the value of goods shipped.

While large businesses with combined revenues of over \$20 billion in 1993, freight and mail are, however, still a relatively small part of total air traffic. In volume terms, freight is 25 per cent of total air traffic but the revenues earned from this traffic are much lower and are only 11 per cent of the total (Table 2.3). While freight traffic has grown at a somewhat faster rate than passenger traffic over the past decade – in part because regulation tends to be more liberal – the percentage of aggregate revenue earned from freight in 1992 was slightly less than in 1982. Mail traffic is a very small part of the total air market; moreover, its growth rate over the past decade has been significantly lower than passenger and freight traffic.

Two major factors shaping the development of air freight traffic in the past decade have been the impact of surface competition on short-haul and medium-haul routes and the large volume of freight capacity on wide-bodied aircraft on long-haul routes. In Europe, with the exception of small package services, air freight has had to face highly effective competition from containerised road operations and even on cross-water routes, where air once had an advantage, the introduction of roll-on/roll-off services has blunted that former advantage. Both in Europe and in the United States air freight has great difficulty in competing with surface transport on routes shorter than 1 000 km. On long-haul routes the belly-hold space of wide-bodied aircraft, particularly the Boeing 747, has created a huge amount of capacity which, because airlines could sell it at marginal cost, has been the determining factor in pricing the carriage of freight. Nevertheless, all-cargo operations have survived and freighter aircraft currently carry about 40 per cent of international air freight.

Table 2.3. **World passenger, freight and mail traffic**

	Shares in 1994		Annual growth 1985/94	
	Revenue %	Tonne kms %	Revenue %	Tonne kms %
Passenger	88	70	8.8	4.9
Freight	11	28	6.4	7.5
Mail	1	2	3.4	2.3
Total	100	100	8.4	5.6

Source: ICAO.

## 2. The nature and level of uncertainty

As discussed in Chapter 1, the world is evolving rapidly and the likelihood of trend breaks, new trends and discontinuities will affect the future nature and level of uncertainty in civil aviation (Michalski *et al.*, 1993; Condom, 1993). There are new products coming on-line and methods of production are changing. In addition, new markets, for example in Asia, are emerging and the role of older markets, such as those in central and eastern Europe, is changing. Foreseeing the role of air transport, as a carrier of both passengers and freight, is going to be particularly challenging.

The underlying relationships which foster the development of international aviation are complex and changing rapidly. There are signs that existing links between aviation and key variables are breaking down in some domestic markets (*e.g.* the United States) as saturation levels are approached. Equally important, there is evidence of an increasing number of kinks in the development path of the industry. The Gulf War, for instance, led to a small switch to teleconferencing which has not been reversed by resolution of the conflict. New modes of transport also complicate matters by adding to the forces driving the sector. All these effects will influence both the price of air transport and the demand for its services.

A variety of potentially significant structural developments in the market may also produce changes in the way international aviation develops. In some areas there is an established body of knowledge about the importance of some of these factors. Many forecasting frameworks, for instance, have traditionally relied heavily on changes in income as a key driving force in their analysis (*e.g.* Boeing, 1996; International Civil Aviation Organisation, 1994*a*). As seen in Chapter 1, an obvious difficulty is that forecasting future levels of GDP is itself extremely difficult – GDP is sensitive to short-term shocks, and the determinants of long-term growth are still little understood. To do it for specific submarkets is an even more precarious activity.

An additional problem in assessing the future trends in factors which influence air transport is that these factors themselves often vary in importance across different markets. In some instances, for example, geography means that aviation provides a monopoly of services and that potential future competition from other modes of air transport will not be an issue. Equally, in other cases, because of the nature of the aviation market, several factors affecting air transport may interact to produce synergy effects. For example, increased demand for passenger travel may generate belly-hold capacity for cargo. As a result, the nature of future uncertainties is likely to vary in different markets.

### *Development of business markets*

The past twenty years saw significant and not fully anticipated growth in the Asian-Pacific aviation market, mainly due to growth in business travel. There are also now prospects that air transport markets will develop in the central and eastern European countries. These new markets provide the prospect that airlines can exploit economies of density and scope more completely and that genuine global carriers will emerge.

Predicting the speed at which these markets will develop is difficult, because of the major structural changes taking place in their economies and because of the political uncertainties that remain.

One factor which will influence the longer-term growth of business travel will be the development of business service activities. These industries, however, tend to be relatively footloose, and their overall growth is sensitive to the business cycle. Another factor is the geographical widening of manufacturing and services activities entailing more and longer trips for managers and for technical liaison purposes. Set against this are, however, new developments in management philosophy which have resulted in longer-term uncertainties about the role of travel-intensive middle management.

### ***Developments in tourism and leisure travel***

The availability of air transport has been a significant contributor to the rapid growth in leisure travel and tourism. In many markets, there is vertical integration involving airlines, hotels, car rental and so on. Even in the scheduled market, around 55 per cent of air travel is estimated to be for leisure purposes, with 75 per cent of such travel being between OECD countries. In the longer term, one must anticipate growth in the overall demand for such travel as incomes rise, but equally geographical shifts will take place in the market as tourists seek out new locations and experiences (OECD, 1994*e*).

As was discussed in Chapter 1, demographic and social trends coupled with increased leisure time will influence the longer-term pattern of tourism and leisure travel. The link is not, however, simple. The tendency in Europe has, for instance, traditionally been for individuals to locate close to their families, a situation which differs from the more saturated aviation markets of North America. Simply extrapolating data on visits to family from more mature air transport markets, therefore, is unlikely to provide insights into similar travel in Europe.

The uncertainties related to these geographic and social trends are likely to be compounded in the future by the influence of higher disposable income. Higher incomes not only provide the finance for more leisure-related travel, but also are generally associated with more choice in leisure destinations, greater opportunities to visit friends and relatives and enhanced flexibility in the timing of tourist travel. This poses additional challenges to the aviation industry to match its supply of services to these new patterns of demand.

### ***Developments in cargo markets***

Air cargo is an increasingly important industry in its own right and, when cargo is carried in belly-holds or on combi aircraft, it is becoming entwined with passenger operations. It is also a sector of aviation which is dominated by international movements. Boeing (1995*b*), for example, forecasts that by 2014, 80 per cent of air cargo by revenue tonne kilometres (RTKs) will be international. On many long-haul routes, carriers such as KLM, Northwest and Lufthansa earn a significant part of their revenue from cargo traffic. The demand for cargo space is determined by the nature of goods traded, the importance

of attributes (such as speed) which air freight can offer, and the geographical distribution of production and consumption.

Air cargo also provides an important service for perishable goods, such as flowers, fruits and vegetables. These are markets which are susceptible to changes in consumer tastes and to changes in production technology. The introduction of new horticultural methods, for instance, has in recent years permitted the growth of some tropical fruits and other plants in temperate climates, reducing the demand for air transportation. New products from different regions, however, have also emerged as market-widening has taken place.

An important development in the air freight market over the last ten to fifteen years has been the transformation of national small-package service operators into globalised, all-cargo express service operators/integrators. After vigorous growth in the United States markets, express operators are developing rapidly in the international air freight market. Following the trends highlighted in Chapter 1, spare and replacement part transport, for instance, requiring rapid and reliable delivery, is likely to see significant continuing growth. Set against this is a possible reduction in the movement of documentation (*i.e.* courier demands) as alternative information technologies become more acceptable. The overall effect of these developments is, however, difficult to predict, as past experience has shown that the introduction of new telecommunications means such as the fax machine have not led to the expected decline in documentation transport.

### *Alternative modes of transport*

Some short-haul aviation markets are suffering from increasing problems of infrastructure congestion. Expansions of capacity are taking place and improved management of existing capacity is occurring. Whether this will optimise the congestion problem is one issue, but equally there is the possibility that efficiency of the overall transport system could be better handled by fostering alternatives to air transport in cases where they have a comparative advantage. Defining situations where alternatives have such an advantage, however, is difficult where there is no genuine market.

In Europe, for example, high-speed rail has taken traffic from aviation on some domestic routes (*e.g.* Paris-Lyon). Whether, however, this reflects a genuine advantage is difficult to assess, given the capital subsidies injected into high-speed rail and the regulated environment in which domestic aviation usually operates. Further, whether such services will simply meet demand in niche markets in the future or prove a major competitor to air is difficult to predict. Early evidence up to July 1995 regarding services across the English Channel shows that since the opening of the Channel Tunnel the number of passengers flying from Brussels to London-Heathrow and London-Gatwick has diminished by 6 and 22 per cent, respectively, while the number on the London-Paris route has declined by 35 per cent. This should be taken in the context of an overall capacity increase of air together with rail seats on these routes of 88 per cent.

### *Alternatives to transport*

While the fare costs of business travel have fallen in real terms, the overall opportunity costs of attending business meetings (*e.g.* including travel time costs) have tended to rise. Alternatives are now emerging as a direct response to this rise in opportunity cost: videoconferencing, teleworking and so on. Although some adverse effects on air transport have been observed, to date the impact of these alternatives has been relatively small. But the costs of using telecommunications are falling and technologies are becoming more user-friendly. Videoconferencing, for instance, no longer requires specialised studios and equipment, and line costs have fallen while technical reliability has improved. The take-up has also increased following the crisis for aviation after the Gulf War.

The longer-term implications for international aviation are less clear, in terms of both magnitude and direction of impact (Cook and Haver, 1994; Button and Maggi, 1995). With regard to the potential order of magnitude, a range of studies suggest that telecommunications could technically replace up to 25 per cent of business travel. Telecommuting, for example, replaces those meetings which are regularly held between people who have enjoyed previous contact. Equally, however, there is a resistance to abandoning actual business trips which can help develop business networks and provide some personal utility in their own right. Combining electronic and face-to-face communications allows individuals to maintain a larger network of contacts and to intensify links with existing networks. Potential is not, in other words, the same as actual, and complementary effects might well outweigh substitution effects. By expanding networks, it is possible that developments in telecommunications may encourage air travel (Mokhtarian, 1990).

### *Institutional changes*

The structure of regulation in international aviation has become increasingly less restrictive in many parts of the world as bilateral arrangements have become more liberal and regionalateral agreements have emerged (Gunther, 1995). The changes which have taken place have influenced the levels of traffic on the routes concerned. In other instances, they have affected the relative performance of the various carriers involved. Institutional change can also be observed in the provision and operation of infrastructure (airports and air traffic control). There are mounting constraints on the ability of existing infrastructure to handle growing air traffic volumes. The institutional response to this constraint will affect both the scale of future developments in international aviation and the operators which are allowed to provide services. The situation becomes more complex if powers formerly nested in national governments – for example, over such things as air traffic control – are transferred to supranational institutions.

The time path, direction and intensity of institutional changes are difficult to predict. The General Agreement on Trade in Services (GATS), for instance, applies to only three areas of international air transport, namely aircraft repair and maintenance, selling and marketing, and computer reservation systems. The GATS is, however, a framework agreement which is open for further negotiations, and the scope of coverage of air transport will be reviewed within the next five years. It is clear, though, that considerable

variation in views exists regarding the need for liberalisation and the ways change may be brought about. The United States, for instance, is in favour of an open skies approach involving multilateral agreements (United States Department of Transportation, 1995), while many Asian countries favour a more regulated environment (Stirland, 1995). Where change has occurred in the recent past, for instance within the European Union, this has often been difficult to foresee. Given the diversity of forces at work, it is ever less certain what institutional changes will take place in even the short to medium term. This can pose particular problems for an industry which is trying to restructure itself to meet the challenges of market forces and infrastructure constraints.

### *The price of aviation services*

The conventional economic argument is that, everything else being equal, the quantity of air services demanded will rise as fare levels and freight rates fall. In general terms this is unquestionably so, and historic declines in the levels of fares paid have been accompanied by higher traffic volumes. It is also true to say that many of the influences governing fare changes over the medium to long term have been relatively easy to foresee. Predictions of the exact magnitude of future changes and their short-term effects are much less certain.

There has always been a problem in establishing the elasticity of demand with respect to fares and freight rates, and a variety of estimates have been generated – these range from  $-0.4$  to  $-4.51$  in the context of passenger traffic (Oum *et al.*, 1992). Part of the explanation for the diversity is that the elasticity varies across fare classes (first class, standard economy and discount fares) and by distance (long haul versus short haul). Additionally, these variations are closely tied to the trip purpose. For instance, the price elasticity of demand for leisure travel is significantly higher than that for business travel. The widespread adoption of yield management by many airlines also means that even within many fare classes there are many discount options. It is also often difficult to isolate fare effects from other service quality influences on demand. For example, where efforts have been made to isolate service frequency elasticities in the United States domestic market (Morrison and Winston, 1986), these were found to be of the order of 0.21 for business travellers and 0.05 for leisure traffic.

These are known problems and the levels of uncertainty are appreciated. What is changing, however, is that the nature of fare structures is altering and travellers are becoming better informed (*e.g.* make greater use of travel agents or computerised information sources), or simply become more familiar with the system as they travel more. The result is that the notion of fare classes is being replaced by a continuum of different fares and travellers seek out the packages of fare/service characteristics that they want. The concept of the price of air travel has become fuzzy.

The difficulties of predicting future prices are being compounded by a variety of other factors. In the past, steady technology shifts in aircraft design and operation (*e.g.* more efficient engines and the use of low-weight composite construction materials) have helped to pull down the real cost of air travel. Indeed, the introduction of twin engine operations over the North Atlantic led to an increase in aircraft movements at a



time when the weakness of the United States economy was reducing demand. While improvements in aviation technology will continue, it is less easy to see the form they will take. Future technical changes are also likely to be of a different kind. In particular, they may relate to the infrastructure of aviation rather than to operations as more sophisticated air traffic control systems come on line. The implications of this and the timing of the impacts are uncertain.

One factor which may have an important impact on the future price elasticity of demand for air transport in some markets is their relative degree of saturation. On the basis of per capita travel measured in revenue per passenger miles (RPMs), North America appears to be the most mature market, with some 1 800 RPMs per capita in the beginning of the 1990s compared to 500 in Europe and only about 100 in the Asia-Pacific region. What actually constitutes saturation, however, may change over time in response to economic, social and demographic developments, resulting in an increase in the absorptive capacity of particular markets and a postponement of the saturation process, even in the most advanced industrialised countries. For instance, the growing proportion of relatively well-to-do and healthy retirees in these countries should contribute to the increased demand for leisure-related air travel. Moreover, and in particular outside of Europe, a decline in the average family size should foster the demand for air travel since inter-city trips made by smaller travelling parties are more likely to be made by air than by alternative modes of transport.

### *Environmental and fiscal policies*

The natural environment is now a matter of increasing policy concern. There is evidence that a combination of market imperfections and previous official policies in the transport sphere have resulted in excessive environmental degradation (OECD, 1992b). The reaction at both local and global levels has been a trend for increasingly tight controls (*e.g.* through regulations and the use of economic instruments) in the way transport of all forms impinges on the environment. Inevitably this will have implications on the price of air transport. It will affect it directly as restrictions are imposed on aircraft operators and aircraft design, but it will also affect it through its impacts on competing and complementary modes of transport. Again, from the longer-term perspective, it is difficult to isolate the exact nature of these impacts without a clearer picture of how environmental policy will emerge.

There are also changes in the fiscal environment. In the face of tighter economic spending policies, users are being forced to pay directly for the infrastructure they use. New airport capacity, for instance, is now frequently being directly financed from explicit user fees (*e.g.* the expansion at Vancouver). Additionally, air travel, because of the ease of collection and identification of the revenue base and the fact that many of those paying the tax do not vote in the jurisdiction imposing them, is now being seen as a subject for sumptuary taxation in some countries. It is difficult to foresee the degree to which this practice will develop and how it will affect fare levels.

The important distinction between these types of effect and the more traditional influences on price is that: first, they are new and it is therefore not possible to extrapolate

market reactions from previous experience; and second, they often stem more from policy actions than from technical changes and, in consequence, the path of change is more difficult to envisage. They are by nature less easy to incorporate into the more conventional frameworks used in international aviation demand forecasting.

### 3. Uncertainty and forecasting

Information is an important commodity. The availability of good information helps to improve the efficiency of an industry. In particular, information about future trends and developments is important for operational and policy planning. One element of information in this context involves a clear picture of how the existing market is functioning – indeed, this is essential for airlines if acceptable load factors are to be achieved, and partly explains the development of computer reservation and data interchange systems. In addition to this, and the subject here, is the importance of developing systems which provide insights regarding probable future trends. At one level, this may involve relatively short-term demand forecasts for negotiation purposes at the IATA's twice-yearly scheduling conference. At the other extreme, there is the need for longer-term demand analysis to meet the requirements of strategic planning.

#### *Approaches to forecasting*

Broadly, there are five main groups which make use of forecasts (European Civil Aviation Conference, 1994):

- *Airline operators* who seek short- and medium-term forecasts at a micro level. The operational requirements for rapid access to these forecasts and the level of aggregation needed preclude excessive sophistication. Airlines with the ability to spread the burden of uncertainty across a large network can internally insure against poor forecasts. Smaller carriers, in spite of the fact that forecasts are now available at relatively moderate cost, are therefore much more affected by serious misjudgements. This is particularly true when there are constraints on market entry and exit.
- *Aircraft manufacturers*, because of the need to plan and execute production runs, tend towards more sophisticated medium- and long-term forecasts. They are also broader in their outlook, being concerned with types of markets rather than individual route demand projections (*e.g.* Airbus Industrie, 1993; Daimler-Benz Aerospace, 1995).
- *Infrastructure suppliers* (*e.g.* airports) take a very-long-term view. The longevity of investment, its indivisibility, its specificity and high cost make this essential. Given the network nature of much aviation infrastructure (*e.g.* air traffic control systems), there is an incentive to pool information and forecasts across the network.
- *The users of international air transport*. Many users of air transport require knowledge about the future demands on the industry. This is particularly true

regarding tourism and leisure travel where short- to medium-term forecasts facilitate planning and investment: here, forecasting of capacity and costs of aviation services are important (World Travel and Tourism Council, 1993).

- *Policy-makers*. Efficiency in markets is never fully achieved but is constrained by a variety of market imperfections and institutional features. Policy-making involves reducing the impact of these failures. To do this in a dynamic context, it is important to have foreknowledge of their nature and implications. The requirements of forecasts are thus often less quantitative in orientation and more concerned with exploring qualitative market evolutions and policy options.

To help meet these differing requirements, a number of regular forecasts provide predictions relating to various aspects of international aviation. These come from international agencies (such as the ICAO and the IATA), national governments (such as Transport Canada), non-governmental agencies (such as the World Travel and Tourism Council) and from aircraft manufacturers (such as Airbus Industrie, Boeing and McDonnell Douglas). Some of these forecasts are relatively short term (*e.g.* the four-year projections of the International Air Transport Association, 1993*a*), while others extend well into the next century (*e.g.* Boeing, 1996); some are sector-specific [*e.g.* those of the World Travel and Tourism Council (1993) relating to tourism and Boeings' (1995*b*) on cargo] while others are designed to indicate probable equipment needs (*e.g.* those produced by the aircraft manufacturers). Forecasts are also often produced for major market areas, such as those by the International Civil Aviation Organisation (1994*b*; 1994*c*) for the Atlantic and Asia/Pacific Areas and the International Air Transport Association (1993*b*) for Asia/Pacific markets. Local forecasts are also regularly made by airports to conform with planning and other legal requirements.

The underlying approaches to forecasts often differ. In part, this is because of the differing demands placed on their outputs, but it is also because of varying views on the nature of key underlying relationships (*e.g.* elasticities) and differing ideas regarding the future time trends in the major determining variables. The majority of models are, however, primarily based on conventional economic inputs derived chiefly from standard indicators regarding the predictions of gross domestic product, oil prices and air fares (*e.g.* International Civil Aviation Organisation, 1991).

### ***Performance of forecasting***

In the past, forecasting of aviation market developments was conducted assuming a relatively stable set of relationships. For example, competing modes of transport and alternatives to making personal trips were limited; markets were not approaching saturation; and technical changes within the industry were relatively easy to foresee. Additionally, the institutional backdrop was fairly constant. In economic terms, there have also been only two major recessions in the jet age. There was consensus among forecasters that the most important single long-term factor in influencing passenger demand was economic growth.

Nevertheless, the forecasts produced have, like most economic forecasts, generally proved to be of varying reliability (Transport Canada, 1993). They have, for example, not

been good at coping with broad swings in the business cycle, with a tendency for forecasts produced during periods of economic expansion (*e.g.* in the late 1980s) to be over-optimistic and those during recessions (*e.g.* in the early 1980s) to be excessively pessimistic. Boeing (1993), for example, provides a detailed assessment of its forecasts. This type of error, if the forecasts are used extensively as the basis for investment decisions, could lead to overinvestment as economic expansion occurs with excess capacity left in the subsequent slump. Capacity shortages during upturns would result from accepting the predictions made in recessions. The simple fact is that the models, which are more or less sophisticated extrapolations of the past, are poor predictors of turning points.

More disaggregate geographical forecasting has tended to pose greater problems. Table 2.4 is a comparison of total flights over the North Atlantic corridor with the forecast over the past ten years provided by the International Civil Aviation Organisation (1994*b*). While the complete set of forecasts do provide a limited allowance for uncertainty by offering ‘high’ and ‘low’ figures, the general accuracy of the forecasts is variable. In the mid-1980s, there was a marked tendency to produce under-predictions – these were as high as 35 per cent over a six-year horizon. In spite of the cyclical economic development during the period, it is also interesting to note that only two years, 1986 and 1988, showed actual demand to be below the one-year prediction.

At the level of individual carriers, the experiences of low and negative profits earned by many airlines in the early 1990s is a clear reflection of the difficulties of micro-level forecasting. Recent analysis of the US domestic market (Morrison and Winston, 1995) provides evidence that while changes in regulatory regime have not exerted a significant influence on this situation, US carriers have found it difficult to predict accurately future levels of key economic variables such as income. These forecasting errors were behind the excess capacity which developed in that market in 1990-93.

The relatively poor performance of forecasting in aviation, in line with many economic forecasts, is, in part, a reflection of the current technical state of economic forecasting. One of the problems is the inherent difficulty in developing good economic models of any industry which can then be translated into an econometric framework. Ideally, for example, one would require separate models of demand for air services and for the supply of services, and calibrate them simultaneously. In practice, there is an inevitable tendency, often the result of practical expediency, to blur these essential distinctions. It is also difficult to include all determining variables in econometric models, not only because data are often incomplete, but also because many of them are not amenable to quantification. While some of these problems can be handled using modern econometric software, others still pose serious difficulties. These are technical problems which are unlikely to be resolved in the future.

### *Current forecasts*

Long-term forecasts of air passenger traffic are made by, among others, the International Civil Aviation Organisation (1993), Boeing (1996), Douglas Aircraft Co. (1992), Airbus Industrie (1993), Daimler-Benz Aerospace (1995) and the International Air

Table 2.4. North Atlantic flight forecast comparisons

Thousands

Base year forecasts	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
1980	127.6	130.2	132.7													
1981	125.7	128.0	130.4	133.0												
1982	125.8	128.1	131.4	131.6	132.0											
1983	127.8	129.1	131.7	131.7	133.6	135.3										
1984	132.7*	138.3	139.8	142.8	147.9	152.0	153.6									
1985		140.8*	143.5	144.2	148.5	151.5	156.0	159.5								
1986			141.4*	149.8	151.9	154.8	159.0	164.0	168.9							
1987				158.5*	177.2	187.3	195.3	203.4	209.8	215.4						
1988					175.7*	187.6	197.3	204.5	212.9	221.6	229.1					
1989						192.0*	205.4	216.4	225.6	235.6	244.4	253.6				
1990							206.1*	205.0	213.9	224.4	236.7	249.3	263.1			
1991								213.0*	220.3	233.5	247.0	258.1	268.1	277.6		
1992									228.2*	238.0	252.2	263.3	278.9	294.3	312.5	
1993										242.8*	252.8	264.5	277.2	291.2	305.2	320.1

\* Actual.

Source: ICAO.

Table 2.5. Comparisons of forecasts of world passenger traffic

	1990		2000		2010
<b>ICAO</b>					
Growth index	100		163		
Annual growth		← 5.0% →			
<b>BOEING</b>					
Growth index	100		153		252
Annual growth		← 4.3% →		← 5.1% →	
<b>DOUGLAS AIRCRAFT</b>					
Growth index	100		163		294
Annual growth		← 5.0% →		← 5.7% →	
<b>AIRBUS INDUSTRIE</b>					
Growth index	100		165		271
Annual growth		← 5.2% →		← 5.1% →	
<b>IATA</b>					
Growth index	100		166		252
Annual growth		← 5.2% →		← 4.3% →	

*Notes:* 1. ICAO forecasts only until 2003.  
2. All forecasts in passenger kms except IATA which is in passenger numbers.

Transport Association (1993a). The conclusions of their forecasts are summarised in Table 2.5, which shows traffic estimates for 2000 and 2010 as an index of 1990 at 100. There is a close similarity in the estimates with a general agreement that traffic will grow at an annual rate of 5 per cent until 2000 and in a range from 4.3 to 5.7 per cent a year from 2000 to 2010.

Global developments are based, to a very large extent, on aggregate indicators of economic growth, fare changes and operational developments. There are, of course, wide variations in these parameters in different parts of the world which give rise to equally large variations in the growth of international air travel.

The ICAO makes forecasts of the major international traffic flows and Table 2.6 sets out some recent estimates. The forecasts are for the numbers of passengers carried on each route, not passenger kilometres, and therefore do not precisely measure the different volumes of each route. This does not, however, affect a comparison between the rates of growth which are forecast for each route. The most important features are the much-above-average growth rates estimated for the transpacific region. Boeing (1994) makes traffic flow forecasts in a slightly different way and has produced estimates for intra-regional growth as well. Features of the estimates are the intra-Asia, Europe-Asia and transpacific traffic flows. By contrast, significantly lower growth rates are forecast for intra-Europe and US domestic traffic.

The traffic flow forecasts, however, are incomplete in describing the development of travel, because they tell nothing about the destinations of traffic. For this purpose the

Table 2.6. **ICAO forecasts for major traffic flows**

	Passengers carried (thousands)				Average annual growth rate (percentage)	
	Actual 1982	Actual 1992	Estimate 1993	Forecast 2003	1982-92	1992-2003
North Atlantic	16 345	35 425	34 260	60 589	8.0	5.0
Mid-Atlantic	1 444	2 350	2 364	4 019	5.0	5.0
South Atlantic	1 065	2 130	2 674	3 643	7.2	5.0
Transpacific	7 083	16 154	16 978	37 665	8.6	8.0
Between Europe and Asia/Pacific	5 018	14 738	16 290	32 654	11.4	7.5
Between Europe and Africa	8 568	9 399	10 289	13 010	0.9	3.0
Between Europe and Middle East	3 336	6 485	5 080	9 467	6.9	3.5
Between North America and South America	2 420	5 249	5 301	8 978	8.1	5.0
Between North America and Central America/Caribbean	9 970	15 219	15 436	24 698	4.3	4.5

Source: ICAO.

forecasts published by the World Tourism Organisation of international tourist arrivals act as a complement (World Tourism Organisation, 1994). Table 2.7 sets out the World Tourism Organisation forecasts of the distribution of tourist arrivals in six different regions of the world in 1990, 2000 and 2010. The increase of the Asia-Pacific share of world arrivals from 11.5 per cent in 1990 to an estimated 20.3 per cent in 2010 is the main feature of this forecast. From the point of view of traffic origin, inter-regional traffic in the Asia-Pacific area, which is already 73 per cent of the total, is estimated by World Tourism Organisation to increase to 80 per cent by 2010.

The International Civil Aviation Organisation (1993) has developed a simple model for air freight forecasting. The two major parameters are world trade, instead of GDP, and

Table 2.7. **Regional distribution of tourist arrivals**

	1990 %	2000 %	2010 %
Europe	62.6	56.3	50.8
Middle East	1.5	1.7	1.9
America	20.4	22.2	22.1
Africa	3.3	3.6	3.8
South Asia	0.7	0.9	1.1
Asia/Pacific	11.5	15.3	20.3

Source: World Tourism Organisation.

the level of freight rates. The analysis leads the ICAO to the conclusion that international air freight will increase by 7 per cent a year from 1992 to 2003 and domestic air freight will increase by 3.5 per cent a year over the same period. The total market increase is forecast to be 6.5 per cent a year, which is slightly lower than the growth rate achieved in the 1982-92 period.

These forecasts all tend, to a large extent, to rely upon traditional extrapolative methods, often combined with long-term growth curves. There is also the problem of the ‘gregariousness syndrome’, which leads to a fairly close community of forecasters being unduly influenced by the conclusions of other members of their fraternity. Further, there is a danger of allowing current events, particularly booms and slumps, to have undue influence on views about the future. Even where econometric analysis has been applied to generate the forecasts, these pitfalls remain. Given the evolving nature of the global economy, these are serious limitations.

#### **4. Coping with uncertainty**

The factors influencing the international aviation sector are changing as existing trends evolve, new trends develop and trend breaks occur. Looking forward, therefore, beyond the very short term poses serious problems for the sector. Traditional forecasting procedures often proved to be of little reliability. As they stand, the traditional ways of looking at the future are inadequate and fail to embrace future uncertainties.

Responding to the new situation requires action on three broad fronts.

##### *New approaches to forecasting*

The international aviation industry and policy-makers are already responding to the changing nature of uncertainty they are encountering. In one instance, the traditional forecasting institutions are adjusting their approaches in an attempt to reflect new trends and to deal more satisfactorily with the implications of uncertainties regarding current trends. Additional variables are, for instance, being included in some forecasting frameworks. Perhaps more importantly, there is now a greater use of scenario analysis to look at the potential implications of different futures.

Most of the scenarios being explored relate to trends in economic and technical variables (e.g. Transport Canada, 1994) and very much reflect the more traditional sensitivity analysis. Increasingly, though, account is also taken of policy shifts. Boeing (1994), for instance, has developed a scenario about the longer-term prospects and implications of emerging global networks. British Airways (1995) has developed two scenarios to assist in its long-term planning. Airbus Industrie (1993) also discusses the possible implications for the industry of the development of high-speed rail networks.

These refinements to traditional forecasting, however, will not provide a sufficiently reliable basis for handling uncertainty. They still suffer from the intrinsic problems associated with economic forecasting which extend well beyond the confines of the aviation sector (OECD, 1993b).



Table 2.8. **Forecasting methods used by 52 air carriers**

Purely judgemental	31%
Econometric model + judgement	22%
Survey among field managers	22%
External sources	19%
Solely econometric models	5%
Extrapolation of past trends	1%

Source: IATA.

Indeed, the limitations of conventional forecasting for certain elements of the aviation industry are already causing them to look at alternatives. In a recent study of the 52 major world carriers by the IATA, for example, it was found that the largest group of the companies do not use modelling at all to provide forecasting data (Table 2.8). They rely, at least in part, upon judgement in their decision-making. Even where econometric models are deployed, it is often in association with more subjective procedures. The results of the survey point to differences across geographical regions – differences which do not correlate with the scale of the markets involved. Within the United States and Africa, the primary approach was based on corporate judgement alone. European carriers relied more on a collective approach using a combination of surveys by market managers and econometric models. Finally, the Asian carriers were split between those simply extrapolating past trends and those using more complex econometric models. It is, therefore, not a lack of resources which is leading to this more intuitive approach.

The diversity of forecasting methods used by airlines is in part a natural and economically efficient reaction to uncertainty. It is a natural reaction because airlines are seeking to gain what they consider to be the best insight into future trends, and their views on how this is best achieved vary. It is economically efficient because it allows those which gain the best insights to enhance their position. There are, therefore, good reasons to accept that uncertainty can most effectively be handled on a devolved basis. It also means that the uncertainty is spread and, from a wider economic perspective, reduces the probability of serious resource misallocations in the sector as a whole.

### ***Industrial flexibility***

Ultimately, however, the key to coping with uncertainty is through greater flexibility in the way the industry operates. Flexibility allows adjustments to be made as conditions change. Again, there are indications that this type of response is already occurring in some parts of the international aviation industry. The widespread uptake of leasing of aircraft, in addition to providing immediate, short-term cash advantages to airlines, removes some of the uncertainties of capital investment from airline operators. Similar benefits are gained by airports which contract out some of the services which they provide and airlines which contract out maintenance. The internal structure of many

airlines is also now more flexible with, for instance, traditional lines of labour demarcation being broken down.

The structure of the industry is also undergoing a change which, while not always driven by concerns about future levels of uncertainty, is nevertheless very often related to them. At one level, there are continuing developments of marketing devices such as frequent flyer programmes or lounge membership schemes designed to reduce uncertainty about customer loyalty. Perhaps more important, however, are the alliances, franchising arrangements and cross-share holdings which can act, by spreading risk, to temper the worst effects of uncertainty within any particular market. In a sense, they may be seen as a form of insurance arrangement. There is, however, a need for these approaches to be further refined and developed as new situations evolve.

## ENTRY AND EXIT ISSUES IN INTERNATIONAL AVIATION

### 1. Market issues

While international aviation does not have any unique cost features, the combination of several characteristics of its cost function can act as an impediment to the entry of new operators (Doganis, 1991). This can apply at both the route and service levels. These features of the cost function derive from technical characteristics and are independent of any strategic actions by competitors or government regulation of entry and exit. They are quite simply a reflection of the technical characteristics of this particular industry (e.g. Bureau of Transport and Communications Economics, 1994).

In this chapter particular attention is paid to the nature of the aviation market and possible intrinsic features which could impede efficient entry and exit. It essentially explores the various characteristics of the international air transport market, examining if, in reality, there are impediments and, if so, whether they are of sufficient magnitude to justify government intervention.

#### *Economies of scale and size*

The scale of the activities of incumbent operators can pose problems for potential new market entrants. Strictly, *economies of scale* exist if a doubling of output can be achieved with less than a doubling of costs. Such conditions make it difficult for market entry except on a large scale. Studies of the aviation sector, however, reveal little evidence of pure economies of scale in this particular sense. The empirical evidence does suggest some traditional scale benefits for the smallest operators but these are quickly exhausted (White, 1979). They may also exist in specific areas such as marketing and advertising. At least one study of the United States domestic aviation industry, though, suggests possible diseconomies at the largest firm sizes (Spraggins, 1989).

Given the complex nature of the product of the air transport industry it is not surprising that empirical studies using aggregate measures of airlines' output give inconclusive results. If output is measured as revenue passenger miles, the scale of operation of an airline can be extended by increasing *ceteris paribus* the network, the flight frequencies or the number of passenger per flight. The first case could theoretically lead to

economies of network size, while economies of density might occur in connection with the latter case.

Regarding *economies of network size*, the evidence suggests that airlines' unit costs do not fall greatly as they expand their network (e.g. Caves *et al.*, 1984). Cost savings come from attracting more traffic to a given network rather than expanding it to cover an additional origin/destination. This seems to be because any addition to a network increases the quasi-fixed costs of the operator, which may negate the benefits derived from more traffic. Further, good regional connections may be a more effective marketing tool than a large, less coherent network.

Nevertheless, the experience of the United States domestic market is that overall, since market liberalisation, and particularly as the result of widespread merger activity, concentration has increased within the industry. There have also been significant mergers and other forms of joint activities by European airlines, especially within the European Union, in recent years. Overall, as liberalisation has gradually spread across the international market, the global passenger traffic concentrated on the 10 largest carriers slightly rose in the decade up to 1993 from 44 to 46 per cent with similar trends being seen in cargo.

The evidence on route pairs, however, suggests that, on average, there is less concentration at the city-pair level. This increase in head-to-head competition is also highlighted in the report of the United States National Commission to Ensure a Strong Competitive Airline Industry (1993), which states, "we found an airline industry that is more competitive than before deregulation in 1978 in that there is more head-to-head, city-pair competition". Similarly, for Europe those domestic routes operated in a liberalised environment and those international routes which, prior to 1993, enjoyed a liberal bilateral agreement exhibit more competition than those where entry was much more restricted.

In fact, while substantial economies of scale in the traditional sense may be absent in the aviation industry, other economies related to the nature and size of operations exist which help to explain the growing market concentration and which may act as barriers to new market entry and exit. These might usefully be thought of as quasi-scale effects.

### ***Economies of scope, density and standardization***

Standard economic analysis focuses on firms producing a single output. This does not adequately reflect the complexity of relationships between inputs and outputs that characterises an industry such as international aviation. International airlines produce a range of different outputs; they usually operate more than one service on any given city-pair route and provide a number of interconnected routes. *Economies of scope* occur when it is less costly for one airline to provide a range of such services across a fixed network than for a number of airlines to provide them separately. They have traditionally been associated with other forms of network activity and especially those where there is the potential for consolidation and transshipment (e.g. postal services and rail freight transport, and they are now developing in shipping). In terms of market entry, the existence of economies of scope implies that entry needs to be across a range of markets if the costs of

the entrant are to match those of incumbents. On the other hand, successful entry of low-cost point-to-point airlines in the US domestic market in the 1990s demonstrates that costs can be lower for such services than for larger networks.

The United States domestic regulatory reforms have seen airlines seek this diversity of service primarily via hub-and-spoke operations. Elsewhere, in the international market, flag-carriers tend to focus their operations on national hub airports. The empirical evidence that this of itself generates significant economies of scope is not, however, conclusive. One of the main difficulties has been in isolating potential scope effects from other aspects of airlines' cost functions. Further, a major rationale for providing a range of services comes as much from marketing advantages (*i.e.* on the demand side) as from cost savings. Providing a diverse range of services, for example, leads to market visibility and makes frequent flyer programmes more attractive and enhances customer loyalty. These are features of 'network value' or 'value of presence and utility to customer' attributes.

A related issue is that smaller operators and new market entrants can enjoy some of these marketing benefits of diversity by forming alliances. These arrangements can include code-sharing agreements, reciprocal frequent flyer programmes, use of each other's lounge facilities and so on (British Midland, for instance, the United Kingdom's second-largest carrier, has vigorously pursued this approach). While such arrangements may remove an airline's full control over operations, the advantage in code-sharing is that travellers make trips through hubs on a common airline code and, therefore, to all intents and purposes, are on-lining.

Reaping economies from the density of traffic is often at least as important as exploiting economies of scope, although their effects are entwined. As more passengers travel on a route, it becomes possible to use larger aircraft that are cheaper to operate per seat kilometre and to offer more frequent services. These factors lower the cost per available seat kilometre. *Economies of density* occur, therefore, when unit costs fall as the size of the market increases. The adoption of hub operations, by increasing the city-pairs served, allows a carrier to utilise better its inventory of unsold seats. Early empirical evidence from the United States domestic market points to significant economies of density, with a 1 per cent rise in the number of passengers an airline carries over a given network increasing total costs by only 0.8 per cent (Caves *et al.*, 1984). More recent studies point to possibly greater economies (Brueckner and Spiller, 1994). Competitive market entry on any route in these conditions again requires entry on a large scale. Recent entry of low-cost carriers on US and European routes, however, does suggest that some markets are amenable to smaller-scale entry.

Economies in operating a standard fleet of aircraft, *economies of standardization*, also seem to exist. In particular, communality of spare parts, maintenance procedures and flight crews can reduce unit operating costs. This has been exemplified in the United States domestic market by the low costs that Southwest Airlines has achieved partly through its total reliance on Boeing 737 aircraft. Other carriers using standard aircraft lines include TransAsia, which use Airbus Industrie products, and Wideroe, which uses De Havilland products. These economies can be, and are being, exploited in short-haul markets, and there seem to be few impediments to market entry. In some instances,

airlines have made use of the large second-haul market to equip themselves from the outset with a standard fleet.

International aviation, therefore, even in the absence of specific economic regulation, does not conform to the ideals of either actual competition or contestability. While there is empirical evidence that market imperfections due to scope, density and standardization effects are possible, recent US and European experiences suggest that new entry is occurring. The issue is one of the overall importance of these effects as impediments to efficient market entry and exit and, if policy actions are required to regulate for them, the nature of the appropriate official response to minimise any adverse impacts. The policy challenge is to design regulatory instruments which prevent artificial suppression of competition while ensuring that where there are genuine economic benefits they are fully realised.

These types of issues are, though, no different to those found in many other sectors of industry where similar conditions arise. These are problems which policy-makers have considerable experience in handling. This should not be interpreted to mean that defining such policies is easy; but there are long-standing traditions of anti-trust legislation, mergers policy, consumer protection laws and so on that are essentially designed to meet these types of problems. The current situation, however, is that elements of government intervention in the international aviation market are frequently designed not to address these issues but rather to protect flag-carriers' market share (Michalski *et al.*, 1993).

### *Economies of experience*

One notable outcome of the recent liberalisation of aviation, and of other markets such as buses (Button, 1989), is the ability of many incumbents to remain in the market and often to strengthen their market position. There may exist *economies of experience*. Part of this effect is sometimes due to residual endowments of market power left after reforms (for instance associated with the grandfathering of landing slots) and in part to the initial diversity and scope of incumbent's operations. Even accepting these advantages, there often emerges an additional effect associated with their very existence in the market and the experiences that they have gained from it.

Experience would seem to provide incumbents with buffers against new market entrants in a number of ways:

- *Goodwill*. Potential users of aviation, when confronted with a number of carriers, have varying levels of information on the nature and quality of services. Risk aversion encourages a "better the devil I know" mentality favouring incumbent suppliers. The need to circumvent this with advertising and promotions pushes up costs for new entrants.
- *Knowledge*. Incumbent suppliers have more information on the market being served and can tailor service to specific customer needs. New entrants must sink resources into acquiring such information.
- *Organisation*. New entrants must be able to assimilate the needs of the new service over their other routes, and this entails learning costs throughout the remainder of their organisation.

While these effects can be intellectually isolated, the more important question concerns their quantitative importance. Empirical evidence is scant and exact causal links are often difficult to define. One early study of the United States domestic experience (Baker and Pratt, 1989) looking at the nature of entrants to domestic routes after federal deregulation found that established intra-state airlines had a much larger impact on the interstate market than did newly established carriers. This is supported further by data on entry to new routes in the United States after deregulation. In the first three quarters of 1980, from a sample of 281 market entries, the newcomers already served both endpoints in 245 cases and at least one endpoint in 277 cases (Berry, 1990).

Analysis of the efforts of Compass Airlines to enter the Australian domestic market after liberalisation also points to the difficulties of establishing goodwill and brand identity (Nyathi *et al.*, 1993). One possible method of responding to this type of problem, and one adopted by several airlines linked to British Airways, is franchising. This, at a cost, allows a new entrant to draw on the established reputation of an incumbent. More recent experience in the United States suggests that new entry can be successful in serving markets of less than 750 miles if their costs are low – Morris Air is an example (Bennett and Craun, 1993).

If there are experience economies that can limit market entry, then this poses interesting policy questions. These economies represent a natural market advantage and as such should not be dissipated. Efficiency criteria, however, suggest that these advantages should be available to all if maximum benefits are to be enjoyed. The issues are not, though, unique to international aviation and are somewhat akin to those associated with rights to R&D findings where policies must be found to stimulate and protect innovation while at the same time ensuring new findings become widely available in the market.

## **2. Incumbents' reactions**

A second broad area of concern, apart from genuine market features, involves the ability of incumbent airlines to create artificial barriers to market entry. These often take the form of creating artificial scale effects if the threat is from small, new carriers. Incumbent airlines have a natural incentive and proclivity to protect their position when confronted by potential competition (Levine, 1987). They therefore instinctively seek ways of obstructing new entrants when there are few natural barriers to entry or exit. Indeed, the arrival of newcomers to a sector from which they were previously excluded by regulation may cause an extreme reaction among incumbents. Because new entrants have been banned from aviation in most international markets, there is also likely to be a large disparity in size between incumbent firms and new entrants that adds to the power of the existing operators.

In some countries, transport has been exempted from important aspects of competition policy as applied in other areas of the economy. This means that, unless legislation is reformed, new entrants under a more liberal regime may face responses from incumbents that would otherwise be illegal. These may include predatory pricing, capacity dumping and anti-competitive mergers. Incumbency also often means entrenched access to

infrastructure and institutional advantages that can be used to impede entry. The important issue is whether these reactions are impediments to long-term efficiency or whether they reflect a genuine economic advantage of the incumbent brought about, for example, by superior marketing strategies or higher R&D expenditure.

### *Frequent flyer programmes*

Frequent flyer programmes were initiated in the United States in 1981. By 1986 all major United States carriers operated a programme, and by 1993 membership of frequent flyer programmes had reached 30 million people with 1.7 trillion accumulated miles to their accounts. Programmes have emerged less rapidly outside of the United States, in part because some airlines felt that involvement was essentially a zero-sum game, while within the European Union it was unclear where such programmes stood with respect to competition policy. They have now, however, become widespread across all international markets.

Often linked to frequent flyer programmes is membership of an airline club. Some of these stem directly from miles travelled (*e.g.* British Midland's Diamond Club) while others require payment of a membership fee (Qantas – Australian's Flight Deck) but all offer members private lounges, refreshments and, often, business facilities. They represent sunk costs to airline travellers and hence, at the margin, are an incentive to stay with an airline once a club is joined.

Such programmes assume a large importance in deregulated aviation markets. The policy question is whether they are benign marketing devices or whether they artificially impede efficient market entry, especially by new carriers. Frequent flyer programmes may, as incumbents are prone to argue, be a form of quantity discount rewarding good customers. The alternative view, in the context of business travel, is that they represent airlines trying to exploit the principal-agent problem by encouraging travelling employees to make decisions that are not necessarily in the interests of their employers (Humphreys, 1991). Notwithstanding these questions of motivation, however, is the issue of whether they impede efficient market entry.

The existence of frequent flyer programmes provides incumbent airlines, and especially large carriers, with two significant advantages that can be exploited to deter potential entrants:

- Large incumbents with their extensive route networks give travellers a greater opportunity to earn miles and also have a more diverse set of destinations to offer when the traveller accumulates enough miles to earn an award. Consider, at one extreme, the disadvantage faced by an airline that serves only two destinations. Having accumulated enough miles for a free trip the traveller is rewarded with another trip to the same place (Compass Airlines discovered this in Australia when in an effort to compete with the frequent flyer programmes of Ansett and Australian it offered two free tickets with every Compass Class ticket purchased to the same destination). This problem can be circumvented to a degree by smaller carriers joining together, or with a major carrier, to offer a more attractive



package, but this could involve transaction costs that may still place them at a disadvantage.

- Large carriers can benefit significantly from the non-linear nature of the award structure. By concentrating flying on one or two large airlines a traveller becomes eligible for more attractive awards as mileage accumulates. A recent trend of placing expiration dates on earned miles makes it even more important for a traveller to remain with one carrier.

While these arguments are largely accepted at a theoretical level, the policy issue must involve their quantitative importance as a market entry impediment. Much of what is known in this respect comes from the United States domestic experience, where the programmes have existed the longest. There is evidence from the United States that business travellers are sensitive to frequent flyer incentives (*e.g.* Prousaloglou and Koppelman, 1995). A United States General Accounting Office (1990) study reveals that 81 per cent of business travellers choose flights to build up their frequent flyer mileage more than half the time (Table 3.1). This provides a *prima facie* case for considering their existence as a potential barrier to market entry.

Further, the United States Department of Transportation (1990) concluded that frequent flyer programmes influence choice and give an advantage to large carriers. This is also a view expressed in Canada when its Competition Tribunal in 1993 reviewed the failure of Wardair. Quantification of this effect, however, is difficult. Recent tentative evidence sheds some light on the extent to which programmes may give an artificial advantage to large incumbent carriers in the United States. It asks what would happen to the market shares of airlines if frequent flyer programmes were abandoned. The results suggest that while, in general, larger carriers would seem to lose most and the smallest to gain most there are numerous instances where this does not hold.

It is also insightful to consider what would happen if any airline takes unilateral action and, without changing any other attributes of the services offered, withdraws its frequent flyer programme. Here the evidence is that the largest carriers in the United States, American and United, would lose market share (Morrison and Winston, 1995). Smaller carriers, like America West and Midway, would lose less but still enough to

**Table 3.1. How often United States business travellers choose flights to build up frequent flyer miles**

	Percentage of travel agents reporting
Always or almost always	57
More than half the time	24
About half the time	9
Less than half the time	4
Rarely, if ever	2
Other	3

*Source:* United States General Accounting Office (1990).

explain why they continue their frequent flyer programmes. It would, therefore, seem from this work that once accustomed to frequent flyer programmes, many travellers expect all airlines to offer one. However, the study does not explain the success of low-cost carriers which do not have frequent flyer programmes and which, at present, serve 41 of the 50 main routes under 500 miles in the US domestic market.

What should be remembered is that loyalty incentives are widespread – they range, for example, from coupons to be collected off soap powder boxes to deferred rebate schemes in the merchant marine. In most instances, they are tolerated. This is often, as in aviation, because while they may hinder small new suppliers entering markets, they have few implications for large incumbents wishing to enter a rival's market. There are also ways in which smaller suppliers may themselves develop strategies to combat the barrier, for example by buying into an established frequent flyer programme. British Midland, for instance, co-operates with Virgin, United Airlines, American Airlines and South African Airways as well as with SAS with which it has strong financial links. Incumbents may combine, like the 15 small South American airlines in the Latinpass scheme, to protect their existing position from incursions by larger carriers and, indeed, to penetrate into some of the latter's existing markets. This does not mean frequent flyer programmes have no potential effect on entry, but rather that this effect at present seems muted. Since they are an evolving feature of the market, however, they need monitoring and assessing by the competition authorities.

### *Computer reservation systems*

CRS services provide computerised systems that contain information about air carriers' schedules, availability, fares and fare rules, and through which reservations can be made or tickets may be issued. They now form an integral part of airlines' yield management strategies. The power of computer reservation systems (CRSs) to benefit owning airlines has long been appreciated. Without regulation, it has been argued, airlines could suffer considerable discrimination by the carriers owning such systems.

It is on this basis that CRSs have been the subject of regulation in the United States (since 1984), in Canada (since 1989) and in Europe for a number of years, and a Code of Conduct was established in 1991 by the ICAO governing standards of information display and access. The controls aim to limit exploitation by CRS-controlling airlines. One major problem has been national discrimination. The increased internationalisation of ownership of CRSs (Table 3.2) has tended to reduce such problems. More recently, the General Agreement on Trade in Services (GATS) has sought, in its Annex on Air Transport Services, to bring regulatory regimes covering CRS systems within a wider multilateral framework.

Although historically important, halo effects (booking practices favouring CRS-owner airlines) are diminishing. They are already considerably less in European markets where multiple airline ownership of systems has been more long-standing. Rapid advances in computer technology, the development of the Internet, and the potential ability for passengers to book directly through personal computer systems or by telephone (*e.g.* the ticketless system being used by Southwest, Delta and United Airlines in the

Table 3.2. Airline ownership of computer reservation systems

<b>Abacus*</b> All Nippon Airways Cathay Pacific China Airlines Dragon Airlines Eva Air Garuda MAS Philippine Airlines Royal Brunei Airlines Silk Air Singapore Airlines	<b>Galileo International</b> Aer Lingus Air Canada Air Portugal Alitalia Austrian British Airways KLM Olympic Swissair United USAir	<b>Infini****</b> All Nippon Airways  <b>Sabre</b> American  <b>Sertel</b> Aero Mexico Mexicana Airlines  <b>Skycall</b> Japan Air System
<b>Amadeus**</b> Air France Iberia Lufthansa	<b>Gemini***</b> Air Canada Canadian International	<b>System One</b> Continental
<b>Axess</b> Japan Airlines	<b>GETS</b> SITA	<b>TIAS</b> Qantas/Australian Ansett Air New Zealand <b>Worldspan*****</b> Delta Northwest TWA

\* Worldspan owns 5 per cent of Abacus.

\*\* Amadeus now owns a majority of System One.

\*\*\* Gemini has now been replaced by Galileo Canada, wholly owned by Air Canada, which distributes Galileo International in the Canadian market.

\*\*\*\* Abacus owns 40 per cent of Infini.

\*\*\*\*\* Abacus owns 5 per cent of Worldspan.

Source: Humphreys (1994a).

United States domestic market and the self-service systems developed by SAS and Lufthansa) are also likely to diminish the power exercised by the incumbent owners. Indeed, at least with respect to the United States and the European Union, the recent high-level studies of aviation policy (United States National Commission to Ensure a Strong Competitive Airline Industry, 1993; Comité des Sages for Air Transport, 1994) do not consider the halo issue an important impediment to entry.

Entry, however, can still be constrained in the short term by the high booking fees vendors levy on airlines for each of their segments booked. This is a particular problem because of the flat rate nature of fees for smaller carriers interested in operating in the short-haul market. In Europe, although fees are payable on a non-discriminatory basis by all airlines participating in a CRS, many carriers, because of their partial ownership of systems such as Amadeus, recoup much of their expenditure in the form of profits. The United States Department of Transportation (1990) found that booking fees per segment were about twice the cost of providing the service. As a result of non-ownership, smaller

carriers seemed to be disadvantaged by an estimated 1 per cent of overall costs. More recent evidence, however, suggests that operating margins of CRS operators have come down significantly.

The relatively high costs of using CRSs is a reflection of the monopoly power of the owners of the systems. Insofar as they represent a genuine barrier to entry, these costs must be set against those of initially developing CRSs and the need for a sufficient return to stimulate future R&D. As with many sectors where there are high investment costs, rapid technical developments and potential scale economies, there are accepted mechanisms (*e.g.* price-cap regulation) to contain excessive exploitation.

### ***Predatory behaviour***

Predatory behaviour is conventionally seen as a distortion to competition within the market (Hanlon, 1994). There has been a difficulty in defining predation and distinguishing it in practice from competitive behaviour. A reputation for predatory conduct may, however, be an impediment to efficient market entry. Potential entrants, which consider entering a portion of an existing network, may be deterred if they fear that incumbents are likely to cut fares significantly or initiate a large capacity increase on the contested route. The predatory threat here is latent in the sense that potential entrants base their decisions on expectation rather than actions. In the sense that the power of incumbency *per se* can limit the actions of potentially more efficient newcomers, it can distort the market. There is general agreement that the predatory practices, where clearly shown to exist, should be regulated but that action on latent predatory behaviour is particularly difficult to handle (OECD, 1989a).

It is difficult in most cases for regulators to distinguish at the time of new entry between pricing to maximise profits (or minimise losses) while moving to changed competitive conditions, pricing to fill empty seats, pricing to reflect falling costs due to enhanced efficiency and pricing to drive new entrants out of the market. Latent predatory power is even more elusive. New potential entrants fear that incumbents with fighting funds will, in the short term, reduce prices below costs or introduce large amounts of additional capacity. Where regulation has been attempted, one approach to containing the problem is the Bright Lines approach. This indicates specific rules as to what constitutes predatory behaviour (*e.g.* looking for prices set below a reasonable estimate of the relevant cost). An alternative favoured by the European Union is the Rule of Reason approach that looks at each case in its context (Dodgson *et al.*, 1991). However, the application of these concepts to aviation is limited. There have not been detailed investigations of predation in the international airline industry.

These facts, combined with the natural pressures for efficiency that exist in a strongly competitive market, have led some commentators to question whether it is worth trying to contain predation in liberalised aviation markets where other entry barriers are low (Levine, 1987). With the existence of subsidies and other imperfections, however, the potential for predation remains. Monitoring of a possible occurrence of predatory practices needs, therefore, to be maintained using conventional national competition policy instruments.

## *Retail travel agent incentives*

Partly as the result of the development of CRSs, the vast majority of airline tickets are sold through travel agents rather than airline ticket sales offices. In Australia for example, 85 per cent of international airline reservations are made through travel agents. There are theoretical advantages in this, for instance in terms of customers' abilities to obtain information about flights from a single source. Problems of market entry arise, however, if agents have an incentive to favour large incumbent airlines when advising customers. They may become even more problematic if, as happened in Australia, airlines begin to purchase travel agents.

The way travel agents are remunerated for their services differs between countries. In some cases, such as the United States, carriers negotiate freely and there are no regulations on commission schedules with travel agents. The experience of the United States since the 1978 Airline Deregulation Act until 1995 was that the level of commissions rose because fixed percentage rates were removed and rebates allowed. In 1993 commission payments averaged 12 per cent of fare revenue, up from 4 to 5 per cent in 1978. This, however, has not simply been the result of raising the rate of commission paid per ticket, which in itself may tempt agents to market higher fare tickets more energetically. Airlines paid a base commission rate augmented by override commissions if certain goals are met. Override commission can be as high as 10 per cent but usually the maximum rate was about 5 per cent. More recently, most of the major US carriers have limited the maximum commission paid on a ticket as part of their cost-cutting initiatives. There is little evidence of this being taken up by non-US carriers.

In the United Kingdom, commission overrides are common as are rebates to individual companies (Civil Aviation Authority, 1994). The latter are often separated into different route groupings for rebate purposes. It could be argued that these corporate schemes are more of a problem for new entrants to confront than conventional commission overrides, since they may encourage a company to direct all of its business to a particular carrier even if this carrier does not provide the most appropriate services on all routes. New entry, either by small carriers or from other major airlines, is then more difficult on these latter routes. This problem is likely to grow as improved computer information retrieval is allowing airlines to track clients' use of their services on a global basis, resulting in easier monitoring of customer use in international markets. How strong this argument is depends on the relevant definition of a market and the extent to which companies actively control the travel of their employees. Further, some companies try to avoid tying themselves too firmly to one carrier by putting their business out to tender – this may help stimulate entry to new routes by large existing carriers but would seem to offer little assistance to small new entrants.

Overall, how important agent commissions are for market entry, as opposed to competition within the market, depends, in the first instance, on how much power agents have in influencing customer choice. Again, United States evidence (United States General Accounting Office, 1990) can offer insights. In the United States, 51 per cent of travel agents choose the airline for their clients at least half the time, and at least two-thirds of agents choose the airline on at least one-quarter of the flights they book. Further, a Louis Harris survey found that travel agents choose carriers 41 per cent of the time for

business travellers and 55 per cent for leisure travellers – the former being more frequent travellers and thus better informed. The survey also found that 51 per cent of the agents selected a carrier because of commission incentives at least some of the time. Finally, it finds that agents seem to prefer a small fee from a large carrier than a large fee from a small carrier. This would seem to make it difficult for even a financially robust small entrant to enter successfully. There are, however some counter-arguments (Civil Aviation Authority, 1994). In particular, the power of an agent is at its greatest when dealing with a large number of small carriers, and it is not in the long-term interest of an agent to become heavily reliant on the commissions from a very limited number of airlines.

While agents may have this power, potential new entrants do have mechanisms for containing its impact. In particular, through devices such as code-sharing with incumbents, they become indistinguishable as far as the agent is concerned. It can also be argued that part of the agent's commission reflects payment for better-quality information and the time spent by the agent in supplying it. The range of options provided by incumbents, therefore, justifies paying agents a premium for explaining them fully to potential travellers. Despite this there may be benefits from regulations that force greater transparency regarding commissions, although from a policy perspective the cost of implementing these would seem excessive.

### **3. Infrastructure**

Aviation is dependent on an extensive and highly sophisticated infrastructure, embracing airport facilities, air traffic control (ATC) and navigation systems. This infrastructure is having to cope with increased traffic volumes. The problems of meeting demand are compounded by the concentration of 44 per cent of international passenger traffic at 25 airports in 17 countries and of 50 per cent of cargo tonnes at 15 airports. In 1991, 23 United States airports each exceeded 20 000 hours of delay and, without remedial action at least 33 airports are forecast to be subject to this delay in 2002.

The experience of the United States domestic market is that liberalisation often brings efficiency through competition in the form of hub rivalry. This can only function if there is appropriate capacity at the hub airports and in the associated airspace for high frequencies on a large number of routes. The experience of the liberal bilateral agreements between the United Kingdom and other European states prior to the 1992 European Union package showed that little competition is generated when runway capacity is scarce at the major airport in a region. Similar findings emerge from domestic aviation in Australia.

Hubbing encourages increases in frequency and exacerbates daily peaking both within an airline and in competition between airlines. Contesting airlines need to compete on timing, frequency, cost and by offering better routing – hence the extension of competition implies more flights per route in the peak and more routes. Expectations for passenger traffic growth are that capacity requirements in more liberal markets will be met predominantly from growth in frequency rather than aircraft size. These predictions reflect increasing frequency per route and the introduction of more routes per incumbent

carrier as well as competition from new low-cost carriers. If so, aircraft size will level off sharply and pressure for airspace and runway slots at hub airports will increase. The result is that barriers to entry by new airlines will rise, although competition on individual routes will increase.

These considerations raise two general sets of issues – those relating to the need to expand infrastructure, and those relating to access to existing infrastructure.

### ***Capacity expansion issues***

Experience from the United States, United Kingdom-Europe markets and United Kingdom domestic competition is that traffic is boosted in the short term by 10 to 15 per cent following market liberalisation. Constraints associated with either terminals and ground access systems will contain the benefits of liberalisation if either are at capacity. It is possible to increase capacity by building more facilities at the same level of technology and management skills and by improving the level of these skills. Better management often requires enhanced technology, although the simple application of economic principles (*e.g.* appropriate pricing, commercialisation) is important. The longer-term prospects for enhancing capacity and easing market entry depend upon the speed at which actions along these various lines can be carried through.

Terminal airspace capacity can be enhanced by improving procedures in the airspace serving dense sets of runways and with the application of technologies that increase the precision with which aircraft can track complex paths (Federal Aviation Administration, 1993). Additional improvement is possible using automation to determine optimum sequencing, spacing and scheduling for arriving traffic. Similar developments are being explored to increase departure efficiency. En-route capacity increases can come in the short term from controllers having early warning of traffic approaching from other sectors and from predictions of traffic activity several hours in advance. Other forms of automated support for controllers are planned. Adequate capacity, even on the busiest transatlantic and transpacific routes, should, thus, be assured, as it should over large land masses where control is still procedural.

Since investing in physical capacity would only partly meet forecast runway demand, enhancement of the existing runway capacity can be achieved by new approach procedures. The benefits of new technologies are site-dependent, but could increase capacity by 50 per cent in existing situations, and may make it possible to add 100 per cent in some cases. In addition to these technologies, new runways are planned, for example for 25 of the 33 most congested United States airports. However, in the early 1980s a dozen new airports were planned but only Denver International materialised, indicating that planned capacity increases may not frequently be realised.

The Outline Plan of the Trans European Airport Network (Commission of the European Communities, 1993), assumes that by the year 2000 airport capacity will need to increase by 50 per cent to meet demand. It concludes that existing airport development plans should be sufficient to cover this growth. This may be optimistic. Not only may planning processes slow investment, but many of the main pressure points will tend to worsen. The plan assumes that encouraging the medium-sized regional connecting points

will take pressure off the major connecting points. Historically, however, the faster growth at these points has had the reverse effect. No airline will reduce its frequency to important hubs just because it has opened other routes. The only method of accessing the majority of the major hubs will continue to be by alliance or by benefiting from some form of slot management.

For OECD countries outside the United States and European Union, the planned runway capacity situation is mixed. In Turkey new terminals are planned for Ataturk, Antalya and Esenbogu airports. The principal difficulty in the Asia/Pacific region is that much of the traffic is long haul, with restricted scheduling resulting in pronounced peaks in demand for runway slots. Japan has a serious shortage, especially in Tokyo.

The overall implications of all this are not altogether clear. Airbus Industrie (1994) feels that the situation will be manageable except for European runway capacity and airspace in the short term. Boeing (1994) believes that congestion will not affect traffic growth more than in the past, but will affect operational solutions to it (*e.g.* requiring the use of alternative routes and larger aircraft). A panel of the United States Transportation Research Board (1993) agrees with this scenario, except for some vital nodes in the system that cannot be expanded and where management solutions will be needed.

The key point, however, is that congestion is often not only the result of inadequate capacity, but can also be a reflection of inappropriate policies on access (Stevens and Michalski, 1993). A major difficulty in developing a policy position regarding infrastructure is the current lack of an economic pricing policy in virtually all countries. It is important in the short run that action is taken to implement policies which make efficient use of existing aviation infrastructure, so that longer-run decisions on investment are not distorted.

### ***Infrastructure access issues***

Simple economics dictate that even in an ideal world there should not be excess infrastructure lying around waiting to be utilised. If there is a surplus of infrastructure capacity and entry is regulated only by economic pricing, then access problems do not arise. Indivisibilities in provision, however, mean that even the most economically efficient investment strategy will result in congestion on some parts of the network (where older capacity is moving towards replacement and enlargement) and underutilisation on other parts (where newer investment is just coming on stream). Investment is justified not by the existence of congestion *per se*, but rather when the overall costs of congestion exceed those of adding to the infrastructure. Infrastructure should be accessed by those users generating the greatest economic benefits from it (OECD, 1993c). In practice, however, through a combination of policies designed to protect the interests of favoured carriers or as a legacy of historical accident, the current methods of allocation generally make it difficult for new entrants to gain adequate access to aviation markets even when they are potentially the most efficient carriers.

Despite enhancements, many airports will continue to be short of runway capacity. The Federal Aviation Administration in the United States has long operated a slot allocation policy at its four most constrained facilities. International services are accorded



some priority in slot allocation, a small percentage is ring-fenced for general aviation and the rest is open to trading, the initial allocation having been made on grandfather rights. There is also a ‘use it or lose it’ provision. Other countries rely on scheduling committees. The United States and the IATA methods both pose increasing barriers to entry as activity levels approach capacity in peak hours.

The European Union has taken a first step in slot regulation by requiring independent companies to run local scheduling committees, and by requiring all slots not used for 80 per cent of the time to be put into a pool for reallocation, 50 per cent to be available to new entrants. It is doubtful if this will have much impact on entry at the busiest airports where slots are already very heavily used. This is one reason why the Civil Aviation Authority (1993a; 1995a) can see little advantage in ring-fencing to protect access for smaller operators and thin routes.

The use of more soundly based economic pricing also has its problems. The pros and cons of the peak pricing, auction, trading and administrative reallocation of slots are well rehearsed (Banister *et al.*, 1993). All have their drawbacks. Peak pricing, for instance, has done little except to bar entry for small aircraft at Heathrow.

As aircraft become larger, runway traffic throughput tends to grow in direct proportion to movements without additional cost or construction, but larger aircraft need more parking space. In the process, taxi-lanes and taxiways become more constrained. The introduction of new large aircraft would cause serious difficulties at many major airports. If more air traffic movements are accepted, as well as aircraft becoming larger, the constrained sites of many busy airports will make it difficult to provide land for expanded aprons.

A serious barrier to entry can be the availability of stands, even if the totality of apron space is sufficient. In the United States, the shortage of stands is reflected in inter-airline lease rates, the sublease sometimes costing an order of magnitude more than the original one. If stands are all common use, which is normal practice in Europe, this situation should not arise, but there is little point in an airline gaining a runway slot if no stand is available. Indeed, it may pay an incumbent airline to extend its scheduled turnaround time to ensure continuous use of stands near its own terminal and aircraft handling facilities.

A similar situation may arise inside the terminal with check-in facilities. The common user equipment allows more efficient use of space, but liberalisation reinforces an airline’s desire to extend its product branding throughout the ground handling of its passengers. This not only creates spatial problems in the provision of sole-user lounge facilities, but requires separate check-in, diluting the benefits from common user equipment and making it difficult to open satisfactory facilities for new entrants.

Ground handling services are often provided on a monopolistic basis. In many cases this dates from when the airport was too small for more than one viable supplier. Monopolies, though, often continue even when the airport becomes large, *e.g.* Madrid and Frankfurt. Sometimes fairly close control has been kept on standards, as with franchising for the supply of catering, but generally their quality and costs are not tested in the market. Indeed, within the group of monopoly suppliers the cost of handling a charter Boeing 737-400 in Europe varies from 600 ECU to 2 400 ECU. It could be argued

that safety and efficiency on the ramp require close control of the operation, that capacity would suffer and that inter-airport competition controls costs, but there are airports with busy ramps which do allow competition for aircraft as well as passenger and cargo handling.

The situation is worse when the only handler is the dominant based airline. In effect, the control of ground handling by established airlines obstructs new entrants in two main ways. New airlines may have to pay more to the incumbent airlines for ground handling services than it would cost to provide the services within their own organisations or if there were alternative third-party suppliers. It is also open to question whether competing airlines attend to either passenger or baggage handling as assiduously as the new airline itself. Most would prefer to self-handle, but at the least they need a choice. In some cases existing monopolies have been successfully challenged in national courts, and the European Union is proposing legislation for liberalisation at airports, mainly those handling over 2 million passengers per annum.

Congestion of land-side facilities does not generally result in an anti-competitive barrier to entry. Passengers are not normally segregated by airlines at destinations, although there are exceptions when terminals associated with individual groups of airlines have differing levels of access or kerb provision. It might be argued that this applies with British Airways at Terminal 4 at Heathrow and with the new Eurohub facility at Birmingham and also with Air France at Charles de Gaulle and Air Canada at Toronto, Terminal 2. These arguments are by no means clear-cut. In the United States, with a tradition of sole-use terminals, the management of terminals is regarded as part of the totality of competition.

The United States experience since deregulation in 1978 has shown that control over slots, gates and ticket counters can in some cases act as an important barrier to entry by giving incumbent airlines significant advantages (United States General Accounting Office, 1996). This is often exacerbated by the nature of the agreements between carriers and airport operators. Such agreements may give incumbent carriers the ability to veto airport development which might have helped entrant or rival air carriers. Other nations were able to learn from the experience. Canada, for example, reserved some gates for common use at several airports, and the European Union had several provisions to give some degree of transitional protection to new entrants, especially in smaller markets. Australia, on the other hand, proceeded with deregulation in a situation where almost all domestic airport terminals were owned by one of the two incumbent carriers. This was cited as one of the contributing factors in the initial demise of the new entrant, Compass Airlines (Trade Practices Commission, 1992).

#### **4. Direct intervention issues**

Government regulation of both domestic and international aviation has traditionally involved major restrictions on market entry and exit. The underlying rationale for government intervention at the international level has variously been expressed in terms of meeting safety requirements, environmental conservation, economic security, national

security, sovereignty over national territory, the protection of an infant industry and competition issues. That some intervention in markets, including aviation, is generally desirable in order to contain social costs (*e.g.* in terms of meeting socially acceptable safety standards and ensuring full account is taken of environmental costs) is generally accepted. Indeed, economic controls over market entry and conduct within the marketplace have invariably been accompanied by qualitative regulations designed to meet these social objectives. Government intervention on other grounds is more contentious. In practice, like the Multifibre Agreement for textiles, much of the regulation protects local producers and inhibits the entry of new suppliers.

### ***Bilateral air service agreements***

The Chicago Convention of 1944 established the bilateral system of air service agreements which have since governed international air transport. Bilateral arrangements between countries have the advantage that by limiting the benefits of agreements to specific bilateral partners, this permits experimentation with change on a limited basis (Kasper, 1988). They also allow countries to tailor a package of economic rights to take account of barriers to trade that limit the ability of its airlines to compete in foreign markets.

The issue is not strictly one of the bilateral regime *per se* but rather relates to the ways in which it has often been implemented. Bilateral air service agreements have the considerable merits of flexibility and can be tailored to meet the requirements of specific markets. There are, for instance, bilateral agreements such as those between the United States and the Netherlands, the United States and Canada, and the recent US-German agreement that are relatively liberal. Further, the geographic limitations of specific bilateral agreements may be partially circumvented either by a web of more liberal ones or through the use of 6th freedom rights.

The traditional types of restrictions on entry and exit inherent under bilateral arrangements may, however, impose limitations on the development of the industry. The underlying weakness of the bilateral system is that it cannot accommodate international network traffic flows, which are multilateral in nature. The traditional international market has been served by a national airline from each country, the airlines charging the same fares, and often sharing markets and revenues. Some bilateral agreements also stipulate conditions governing responsibility for such matters as ground handling. The terms of the bilateral agreement reflect the negotiating power and current aviation policies of the countries involved as well as national interests including trade and tourism. With the more restrictive bilateral agreements, productivity was usually low in the protected airlines and costs were high. High fares resulted from both the exclusion of new market entrants and the division of the predetermined market size among the incumbents. The prices for international air services have often been ceded by national governments to the airlines themselves organised under the auspices of the IATA. The control of output to predetermined levels was a precondition of the high fares charged. The protected carriers created by the regulatory bans on new entrants both produced too little and charged too much, compared to a market-determined system.

Recently, there has been a move to liberalise bilateral agreements. A number of these have involved the North Atlantic routes and have formed part of the United States' Open Skies initiative. The main change came with the 1978 United States-Netherlands bilateral agreement involving a significant withdrawal of government involvement in matters of capacity, frequency and tariffs. Preceding the 1993 move towards multilateral liberalisation within the European Union, there were also a number of major reforms to bilateral agreements following the agreement between the United Kingdom and the Netherlands in 1984. These, pushed in particular by the United Kingdom as part of its overall market-based transport strategy, produced a variety of agreements with both European Union and non-European Union states. They, to varying degrees, offered open route access, allowed multiple designation of carriers with no capacity control and initiated double disapproval of tariffs. In 1992 an "open skies" agreement was signed between the United States and the Netherlands which essentially precludes government intervention in the market-place. In 1995 a liberal bilateral agreement was signed between the United States and Canada which, over a three-year period, removes many of the restrictions that controlled cross-border operations. The United States offered an open invitation to engage in multilateral (open skies) negotiations with it in 1995 and has extended its range of liberal bilateral agreements to embrace preliminary arrangements with a number of smaller European nations.

There is now considerable and mounting evidence that these reforms of traditional bilateral arrangements and removal of similar intervention barriers can reduce fares. Examination of the pre-1978 United States regulatory system with its restricted entry showed interstate air fares to be higher than in California where entry was not restricted (Levine, 1965). Equally, Barrett (1987) showed that the highly regulated European scheduled airline industry had led to high costs and fares. *Ex post* studies show that following the liberalisation of the United Kingdom-Ireland bilateral agreement there resulted a doubling of passengers between 1986 and 1988, with the average passenger yield falling by nearly a third. European charter airlines, which operate under a liberal regime of market entry, have significantly lower fares than the scheduled airlines that have operated under a policy of restricted market entry.

Assessing the full economic implications of bilateral agreements is made difficult by the lack of full information regarding their provisions. Bilateral agreements can differ quite considerably in their detail. Typically, bilateral agreements are in three distinct parts:

- The bilateral agreement itself, which sets down the rights regarding tariffs and capacity together with a number of rights relating to matters such as taxation, airport charges, arrangements for selling air services, etc. While governments retain ultimate responsibilities, it is often left to the airlines to decide fares and cargo rates.
- An annex concerned with agreements governing the actual traffic rights granted to each country, *e.g.* routes are specified and 5th freedom rights are defined.
- A number of additions (*e.g.* agreed minutes) that provide refinements to the basic agreement. These additions are generally confidential (despite Articles 81 and 83 of the Chicago Convention), although not in the case of United States-related services. These latter elements make it difficult to evaluate the exact effects on the market created by bilateral agreements.

Table 3.3. **5th freedom operations in Europe**

Period	Routes offered per week*	Seats offered per week
1991 (July)	16	24 456
1992 (July)	21	23 278
1993 (July)	33	38 428

\* There were 636 international scheduled city-pair routes in 1993.

Source: Commission of the European Communities (1994).

There are also implications of the bilateral system for multi-country operations that require a series of bilateral agreements with each state concerned. Equally, the ICAO and others have pointed to the lack of adequate dispute resolution procedures that can lead to protracted disputes. They are also *ad hoc* in their nature and consequently must be treated in the context to which they apply. Again, this makes assessment of their efficiency difficult.

Notwithstanding the change that has occurred in some markets, where bilateral agreements remain, even the liberalised structures that are now becoming more common are restrictive on entry (Doganis, 1991). There is normally the requirement that designated airlines are effectively (and essentially) owned by nationals of the states involved. While 5th freedom rights are increasingly being granted, these are of no practical use unless they are also embraced in the bilateral agreement with the third country involved. Even when this is available the impact can be quite small, as found with the 5th freedom liberalisation in the Third Aviation Package of the European Union (Table 3.3). Liberal bilateral agreements do not free up domestic cabotage rights, which limits the opportunity to develop genuine international hub-and-spoke operations. Of course, there are ways in which airlines can circumvent some of these difficulties (*e.g.* by becoming involved, either financially or through operating arrangements, with national carriers) but these, although they may generate other forms of benefit, may not be as efficient as possible and are themselves the subject of government impediments (OECD, 1993*d*).

### ***Foreign ownership***

There are important links between ASAs and the ownership of airlines. Aviation has taken the place of the mercantile marine as the national flagship of many countries. There are differences in national laws on foreign ownership (Fiorita, 1992) and, despite the gradual process of privatisation that is taking place, many major international airlines are still publicly owned or have a major government shareholding. In other cases there are restrictions that prevent or limit foreign investment in a country's aviation industry (see Table 3.4).

Many nations have foreign ownership limits in their aeronautics or transport acts. While there is some variation in the limits, most stipulate: *a*) that control of an air carrier must reside with citizens or residents of the nation, and *b*) the foreign ownership of a

Table 3.4. **Reservations relating to foreign direct investment in air transport in the OECD Codes on Capital Movement (excluding obligations under international agreements)**

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**Australia, Austria, Canada, Ireland, Japan, Spain, United Kingdom, United States:** Investment in air transport.

**Finland, Netherlands:** Investment in enterprises operating an airline.

**Denmark:** Ownership of an air transport licence.

**France:** Investments in air transport, unless at least 50 per cent of the equity capital is held by French nationals.

**Greece, Iceland, Portugal:** Ownership of more than 49 per cent of the capital of an airline company.

**Italy:** The purchase by foreigners of aircraft in Italy and foreign ownership exceeding one-third of the share capital of companies possessing such aircraft.

**Norway:** Investment in air transport, except through a limited liability company in which at least two-thirds of the capital is Norwegian.

**Mexico:** Investment in air transport, except participation up to a total of 25 per cent in national air transport, aero-taxi and specialised air services and provided an authorisation is granted, above a total of 49 per cent in the administration of air terminals.

**Germany:** Investment in an air transport enterprise exceeding 25 per cent of the capital (establishment of airline enterprises that have their headquarters abroad may be subject to a reciprocity requirement).

**Sweden:** Investment to carry out air cabotage and international air transport and acquisitions of aircraft registered in Sweden except through an enterprise incorporated in Sweden.

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*Source:* OECD Codes on Capital Movement.

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carrier is restricted to a percentage, often in the the range of 25 to 49 per cent of the voting common stock. Where nations do not have formal legislative limits on foreign ownership, there may be *de facto* restrictions. Government regulators have many instruments to use to signal their unwillingness to tolerate controlling foreign interests in a national air carrier.

These rules on ownership, and particularly foreign ownership, of airlines are closely tied to the system of air service agreements (Bureau of Transport and Communications Economics, 1994). The latter have been built on, and rely on, the key principles of:

- exclusive sovereignty over a home country's air space;
- substantial ownership of airlines to rest with citizens in the country of registration;
- effective control of airlines to rest with citizens in the country of registration.

Under the bilateral system each country is effectively free to decide exactly what is meant by substantial ownership. In general, the trend in the past has been to favour national ownership (or, more rarely, joint ownership as is the case with the participation of Norway, Sweden and Denmark in SAS). But as the advantages of more liberal

arrangements emerge, this is being modified. While this does not of itself destroy the bilateral structure of the system, it has implications for it.

Government ownership restrictions on foreign investment in airlines both impede the flow of capital into existing carriers and act to deter overseas companies establishing in national markets (OECD, 1988). Although there has been a tradition of control over foreign ownership, and controls remain in most markets, the situation is gradually changing. A certain amount of foreign ownership now exists and with the privatisations planned this amount will increase (Table 3.5).

The European Union's third air transport package, for instance, sets no limit on the stake a Union national or Union airline can hold in an airline registered in another European Union state. However, restrictions on non-European Union shareholdings remain and, with limited exceptions, non-European Union investors cannot hold a majority stake in any European Union airline. Further, investment, if it is felt to exercise a decisive influence over an airline, can be disallowed. There is the possibility of a more liberal exchange of equity between European Union airlines and non-European Union investors if the latter are from countries that themselves have liberalised their rules on foreign investment in their airlines.

In the United States, foreign shareholding of up to 49 per cent of equity under certain circumstances and 25 per cent of the voting stock is now possible. The government also imposes an *ad hoc* control test to determine whether a foreign shareholder, irrespective of equity held, could exercise substantial influence over decision-making. Australia's privatisation measures have also seen British Airways taking up an ownership position in Qantas, through a trade sale, while privatisation of Air New Zealand in 1989 saw a consortium of Qantas, Japan Airlines and American Airlines purchasing 35 per cent of the share issue. In Japan, aircraft registration by foreign nationals is restricted and foreign ownership of airlines exceeding a third of voting interest is prohibited.

Table 3.5. Foreign ownership of major airlines

Country	Airline	%	Country	Airline	%
<b>Europe</b>			<b>North America</b>		
Austria	Austrian	20	USA	America West	20
	Lauda	40		Continental	20
Belgium	Sabena	49	Delta	10	
France	TAT	49	Hawaiian	33	
Germany	Deutsche BA	49	Northwest	24	
Hungary	Malev	30	USAir	22	
Luxembourg	Luxair	13	Canada	Canadian	33
Russia	Air Russia	31			
United Kingdom	Air UK	45	<b>Australasia</b>		
	BMA	40	Australia	Qantas	49
			New Zealand	Ansett NZ	100

Source: *Airline Business*, July 1994, December 1995.

Overall, the pattern is for restrictions on foreign ownership and involvement in airlines to slowly recede. However, the pattern is not even across regions and markets, and impediments still exist. Moreover, with the change have come further developments of the bilateral system of international air service agreements.

### ***State and other financial aid***

Direct government aid should not be a normal feature of markets, although in a small number of clearly defined circumstances they may be justified. Subsidies in support of social services to remote communities, for instance, may be desirable from an economic perspective to discourage exit provided they are efficiently managed (*e.g.* through international tendering systems). The problems in practice with subsidies are that objectives are often ill-defined, regulations over the ways moneys are spent are not enforced and the conditions governing state aid are not consistent across countries.

One major difficulty is that subsidies are often used to protect less productive airlines and keep them in the market. This lack of productivity usually results not from the nature of scope, density and other such parameters that can affect output, but from the internal efficiency with which airlines manage their resources (so-called X-efficiency). Fear of market domination by more productive foreign carriers can bring about institutional responses that often embrace a financial propping-up of low-productivity flag-carriers. Calculating productive efficiency is never easy but in general terms, and notwithstanding substantial variations owing to markets' and carriers' performance, the productivity of United States airlines is seen to be higher than that of European carriers. On average the physical productivity of European carriers is about 20 per cent lower, with unit costs over 50 per cent higher (Avmark Inc., 1992). Low productivity is one reason why the latter are often in receipt of large direct subsidies. Despite recent improvements, this point still seems to be accepted by the Comité des Sages for Air Transport (1994).

There is often a social concern to ensure that transition to more efficient operations is achieved at the lowest cost to those most affected and, in particular, to the labour force. The major economic benefits that can accrue from more liberalised markets, and the introduction of more productive carriers, suggest that subsidies to protect less-efficient carriers are ultimately likely to impose significant costs. Restructuring subsidies may have a social basis but they also impose direct inefficiencies on the system which limit such potential benefits. They also have adverse distributional consequences for operators that are better managed and adjust more rapidly.

In practice, direct state aid to aviation has been focused on a relatively small number of, usually, state-owned flag-carriers. In Europe, several governments have secured permission from the European Union for assistance to loss-making airlines. Between 1991 and 1994 \$10 350 million in subsidies to state airlines were approved (Table 3.6). They have not been approved without conditions regarding the ways they may be spent (*e.g.* on restructuring rather than on the expansion of capacity) and the associated actions that must be taken (*e.g.* selling off certain assets). The airlines which gained European Union permission for assistance contrast, however, with carriers such as British Airways, British



Table 3.6. **European Union approved subsidies to European airlines (1991-96)**

Airline	Subsidy	Date
Sabena	\$1 800 million	August 1991
Iberia	\$1 200 million	May 1992
Aer Lingus	\$250 million	December 1993
TAP	\$1 100 million	July 1994
Olympic	\$2 300 million	July 1994
Air France	\$3 700 million	July 1994
Iberia	\$690 million	January 1996

Midland, KLM and SAS, which have not received state aid in recent years. The latter, therefore, will ultimately have to compete with refinanced incumbents if they wish to expand into the markets of the subsidised carriers.

Not all financial aid comes through direct government sources, *e.g.* many flag-carriers enjoy the benefits of cross-subsidisation by having monopoly handling rights at airports. Legislative measures can also force the granting of what are effectively private sector subsidies. As an example, in the United States, loss-making airlines are enabled to operate without having to make interest or pension fund payments under the Chapter 11 bankruptcy laws. Similar provisions exist under Article 12 of the European Union's Council Regulation on the Licensing of Air Carriers.

It is difficult, however, to gain an impression of the scale or full implications of these and other implicit subsidies. For any comparative assessment to be made it is important to develop some form of conversion factor – *e.g.* along the lines developed by the OECD with regard to agricultural subsidies. To date, comparable evidence on the relative scale of the different types of subsidy is a serious gap in the understanding of the international aviation market and of the degree of unevenness of the playing field confronting potential entrants.



## THE FUNCTIONING OF COMPETITION

### 1. Competition in the market

Even when there are no major constraints on market entry and exit, competition within international aviation does not conform to the standard, textbook stereotype. In addition to institutional constraints, such as the terms of competition set out in bilateral agreements, the market for international aviation services exhibits several distinct, but interrelated features of which two have potential relevance for competition policy. First, there are indications that aviation markets may, under certain conditions, prove to be unstable in terms of service provision and fares offered. Second, as markets become liberalised there is, at the network level, an observed tendency towards market concentration and the move towards oligopolisation of direct services. One interpretation of this is that airlines are seeking to insulate themselves from potential market instabilities. However, market concentration also has the potential of rent-seeking through excessively high fare levels.

#### *Workable competition*

In practice, competition within the aviation market will inevitably deviate from the textbook ideal. Workable competition focuses on the practical issue of reaping the maximum economic benefits from markets which are not completely competitive nor contestable. It seeks to establish conditions whereby competitive forces are allowed to work to their maximum while recognising that some degree of imperfection is inevitable. The test for the efficiency of workable competition is the extent to which it produces better results than a regulated market.

The evidence to date is that where liberalisation of aviation markets has taken place it has not produced the classic conditions of perfect competition or contestability. Nevertheless, from the body of knowledge which has been collected, it is clear that competitive forces have increased and that concurrently economic efficiency has risen. The picture in the US domestic market (Keeler, 1990) and in several intra-European international markets is, thus, very much in accord with notions of workable competition.

There are a number of reasons why the market is not perfect, beyond those of market concentration and potential instability discussed below. There are wide spatial and temporal variations in the demand for air services and these are not easily foreseen. While

this lack of full information may contravene one of the features of perfect competition – that of perfect knowledge – freedom to react on the part of competitive suppliers provides a more flexible response than does regulation. Equally, on the supply side, perfect competition assumes a perfectly elastic supply of inputs but in practice it takes time to change fleet sizes, modify infrastructure and adjust the labour force. Perfect competition also assumes a homogeneous product but international aviation provides a range of products and services.

While enhanced competition can lead to improved efficiency and consumer benefits, as with any other industry, international aviation does not conform to the ideal of a perfect market. Equally, although traditional economic analysis is applicable to all market conditions, each particular market exhibits a number of distinguishing characteristics (OECD, 1992c). These influence the way the market operates. What policy, therefore, should seek to achieve is that balance of intervention in the market which results in “workable competition” – a situation where levels of concentration may contravene notions of perfect competition, but where further intervention would cause even more adverse distortions. International aviation is no different in this sense.

### ***Market concentration***

As with many markets typified by high capital requirements, concerns are frequently expressed about the potential of monopoly or oligopoly exploitation in a less regulated international aviation market. These concerns have often been related to observations that high levels of market concentration can come about because airlines are seeking to exploit economies of scope and of density or to avoid the problems of market instability. On the revenue side, the evidence is that after a threshold point is reached, the revenues enjoyed by a carrier rise more than in proportion to any additional frequency provided – the so-called “S-curve” effect. Market concentration may, however, lead to carriers exploiting monopoly powers and to the existence of X-inefficiency. The policy issue, therefore, is the extent to which such concentration can impede the workings of a competitive market, result in inefficiency and abnormally high fares. Even if the actual degree of concentration is an important consideration, it is often intertwined with other effects. One of the difficulties in evaluating recent regulatory reforms in this regard is that regulation has been in place for so long that even where liberalisation has occurred it takes time for adjustments to be fully realised. Change has also affected entry and exit as well as the nature of competition within the market making the separation of individual effects difficult. Despite these problems, a few general points regarding the underlying form of the market can be made.

Much has been made of the importance for efficiency of the degree of actual or potential competition on aviation routes. Notions of contestability pay particular attention to the threat of new entry and free exit preventing market exploitation by incumbents. What emerges, however, is that while relatively free entry can influence the behaviour of incumbents, it has not the potency of actual competition in the market. For instance, United States evidence since the passing of the Airline Deregulation Act tends to point to routes with two active competitors having fares at least 8 per cent lower than comparable free entry monopoly routes, while a third competitor brings fares down by a further 8 per

cent. Actual competition in the market also seems to result in a wider dispersion of fares offered on any route than does the simple threat of competition (Borenstein and Rose, 1994). A study of Australian international air routes (Savage *et al.*, 1994) found strong evidence that discount fares on routes with three or four competitors are 7 to 8 per cent less than on monopoly routes and that fares on routes with five or more competitors are 17 per cent lower than monopoly routes. A similar picture emerges for the United Kingdom (Civil Aviation Authority, 1993*b*). These effects cannot be explained by factors such as differing traffic volumes, since the volume per airline is on average smaller on routes with more competitors (Borenstein, 1992).

Evidence of the importance of actual market competition is also provided by the experience of the liberalised European bilateral agreements. In the two years following the liberalisation of the Anglo-Irish bilateral agreement, economy fares between London and Dublin where there were three operators – British Midland, Ryanair and Capital – were almost halved against a background of higher fares between Dublin and other European Union capitals save Madrid where duopolies existed. In Australia, the creation of Compass Airlines to break the long-standing duopoly of Australian and Ansett led to a rapid fall in the fares in the top 20 Australian inter-state markets by more than a third (Street *et al.*, 1993). In all these cases it was not simply the change in entry and exit conditions which influenced the market outcome but also the nature of the resultant competition which emerged.

These types of experience are not unique to aviation. Regulatory reforms liberalising pricing and service quality resulted in lower prices in sectors as diverse as United States and French trucking, United Kingdom inter-city bus operations and long-distance telecommunications services in the United Kingdom, Japan and the United States (OECD, 1992*c*). There is, therefore, a strong case for fostering competition, with adequate safety and environmental controls, even if the contestability mechanism does not work perfectly.

### *Stability issues*

There has recently been concern expressed about the stability of competition in the aviation sector. This, for instance, is one justification for intervention in European Union markets – Regulations 2408/92 and 2409/92 – even after the introduction of the Third Package in 1997. It has long been recognised that under particular cost conditions there is no natural equilibrium and the market is prone to violent fluctuations – there is an “empty core” or “excessive competition” (Button, 1995; T.K. Smith, 1995). The cost of instability for customers is uncertainty over future prices and continuity of supply; for those working in the industry there are issues of employment security; and for suppliers of infrastructure and hardware there are problems in the long-term planning of their own activities. High levels of instability may also increase the costs of capital to an industry. In the extreme case, they could theoretically result in the total withdrawal of supply.

Theoretically, instability could exist in international aviation markets (Telsler, 1994). On the cost side there are clear discontinuities in supply due to the discrete nature of the hardware involved – the plane waiting at a gate is essentially fixed in capacity – with accompanying steep declines in marginal costs. The service provided is perishable – an airline seat on a flight cannot be stored – making it attractive to fill marginal seats at any

attainable level of revenue. On the demand side, there are fluctuations through time which often do not correspond to a pre-published timetable of services nor to the physical life of the assets tied up in the industry. Instability may further be introduced by the high price elasticity, in particular of non-business travel.

Empirical evidence on market instability tends to be rather fragmentary. The workings of markets where constraints on entry and exit have been removed provide some insights. The evidence from the US domestic changes immediately after 1978 is that widespread market entry may well initially take place but then rationalisation occurs (*e.g.* between 1978 and 1987, 210 new carriers were certified but 168 left the market in the same period). In the international domain, similar experiences have been observed on the main UK-Ireland routes, while overall in the course of the second year of operation of the Third Package of the European Union, aviation policy witnessed 57 new airlines in Europe with 37 cancelling services. The question still remains, however, of whether this represents true instability or is a restructuring process.

More important is the potential of industry to cope with instability. When, for example, liberalisation first began in US domestic markets, carriers had no management experience in setting prices or designing network structures. They quickly came to understand the attractions of marginal cost pricing (Borenstein, 1992) and the ensuing rounds of fare wars were due to marginal cost pricing. Other industries, however, also have declining marginal costs. Steel and automobile manufacturing are examples from manufacturing, and legal and auditing firms from services. These firms have learned to live with the economics implied by falling marginal costs. What is the difference between them and air transport? The difference is the understanding that they are in a repeated game, not a single period game. In a single period game, firms will adopt strategies which make them best off, ignoring the implications this may have for competitors. In contrast, in a repeated game, there is more opportunity for tacit co-operation. Firms realise that if they make a decision which harms a competitor, then they will likely face retaliation in the next period. So long as firms realise that they will be targets of retaliation in subsequent time periods, and so long as firms perceive that the game will continue indefinitely, then “rational” pricing will likely prevail.

Applying this concept to airline markets would suggest that when first liberalised, carriers may behave in a short-run, self-maximising manner. This will, unfortunately, imply unstable market conditions. Over time, however, carriers will come to understand that they are playing a repeated game, that is, they will face retaliation in future time periods from rival carriers. As this understanding pervades the industry, then more rational pricing behaviour should emerge. The development of devices such as common frequent flyer programmes and code-sharing, whatever their immediate motivation, also acts to remove some of the instability in the market.

## **2. Airlines’ competitive strategies**

The natural reaction of any actor in a competitive market is to gain advantage over rivals. This may be achieved in a variety of ways – for example, by differentiating the

service provided from that of other suppliers through advertising, by developing customer loyalty or by providing services at lower cost. In some instances the objective may be achieved by raising rivals' costs – it is generally better to compete against high-cost firms than low-cost firms (Salop and Scheffman, 1983). The ability to exercise the resultant market power offers the prospect of enhanced profits.

Airlines have shown considerable ingenuity in developing strategies to attain some degree of monopoly power (OECD, 1988). In highly regulated regimes the power is mainly derived from institutional sources (*e.g.* rights conferred on them under bilateral agreements). As both domestic and international markets have become more liberal, the emphasis has shifted to market-derived measures. Airlines can protect or develop monopoly power through their access to airports and control over slot allocations; through control over information channels (*e.g.* computer reservation systems); and through mergers and other forms of alliances. They can also influence the ability of rivals to compete by strategies designed to push up rivals' costs; control of access to ground handling, CRS control and frequent flyer programmes provide examples.

There is a clear overlap in many instances between the efforts of airlines to contain competitive pressures on them exerted by other incumbents and their actions to limit entry into their markets. Frequent flyer programmes, for example, both influence the terms of competition within a market and can be seen as an obstacle confronting new entry. The focus here is on the competitive issues but cognizance should be taken of the important links with any anti-competitive barriers incumbents may erect against entry as dealt with in Chapter 3.

### ***Predatory behaviour***

A number of studies (*e.g.* OECD, 1988; Klingman, 1992) have highlighted the potential for predatory behaviour in the aviation industry. Predatory behaviour is an example of an anti-competitive activity. The predatory firm suffers a loss in the short term in the expectation that this will induce exit so that the predator can recoup its short-term losses of profit from predation by improving its longer-term market position (Dodgson *et al.*, 1991).

Predatory behaviour in aviation might take a number of forms. One might be price-cutting where the predator charges prices below short-run marginal cost with the expectation of driving competitors out of the markets and being able to recoup such costs in the long run. Alternatively (or as well) the carrier may expand output or service levels beyond their short-term profit-maximising levels. Airlines might also reschedule their services, by matching their competitor's schedules, at times which would not be the profit-maximising ones.

There are a number of reasons why predation is legally difficult to detect. The first is one of distinguishing it from the effects of normal competitive price reductions or service quality improvements. The problem with identifying predatory behaviour is that one would need to know what the competitive response would be in a particular situation. Under some circumstances actions by airlines might be predatory behaviour but under others it might be sound network economics. As it is important to avoid the prevention of

competition under the guise of protecting against (poorly defined) predation, the Committee on Competition Law and Policy of the OECD (OECD, 1989a) has recommended that allegations of predation in general be subject to an analysis which would, in practice, screen out most claims.

A second difficulty in detecting predatory behaviour is that competition agencies have generally been conscious of the need to protect firms against actions by powerful rivals that might go beyond competitive responses. Therefore, if predation is outlawed in one way or another, firms will usually only engage in predatory behaviour if they do not expect to be detected and possibly punished.

It is perhaps for these reasons that there are relatively few fully documented cases of alleged predatory behaviour in airlines (Dodgson *et al.*, 1991). There has been one major US court case, before a jury, which involved American Airlines and its value pricing fares: the airline was judged not to have engaged in predatory behaviour. In the case of Laker Airways the US Department of Justice initiated and later dropped proceedings alleging that several US and foreign airlines had conspired to drive Laker out of business. Laker brought a private anti-trust suit that was settled. There was also a formal investigation by the Australian Trade Practices Commission involving an unsuccessful complaint by the entrant, Compass Airlines, that it had been the victim of predatory responses.

In Europe, there have also been a number of investigations which involved behaviour of a possibly predatory nature. For example, in 1992, a charter carrier, Britannia, had a complaint rejected against British Airways regarding the latter's opportunity for predatory pricing because aircraft used on domestic shuttle services in the week were being deployed on international routes at weekends. The CAA judged that the increased service frequency offered by British Airways on its London-Edinburgh service would make both it and competing Loganair unprofitable. It therefore reduced the number of flights British Airways could provide. There are also investigations by the European Commission which may eventually see the light of day but, in general, in Europe, there have been few formal instances of alleged predatory behaviour, in part because of the previously tight regulation of the industry.

These experiences indicate the great difficulties in investigating predatory behaviour, and in distinguishing predatory responses from genuinely competitive ones. Investigation of predatory behaviour requires detailed data on the patronage, revenue, costs and cost structures of both the incumbent and entrant firms. In addition, the investigation needs to consider the question of what alternative outcomes were possible in the market under consideration: in particular, was there a profitable entry opportunity, and did actions by the incumbent convert it into an unprofitable one for the entrant? An important issue in relation to the second of these questions is that of whether the incumbent by its actions gave up some of the profits it could have earned itself in the competitive situation. Another issue is that of whether entrants' losses were due to their own actions (or primarily due to their own actions since, in a world of asymmetric information, entrants cannot be expected to behave as if they have perfect information).

A survey of the airline industry evidence reveals a number of cases where informed industry experts thought that there had been predatory behaviour in the industry (Dodgson *et al.*, 1991). This includes, in particular, instances where predation seems to



be a plausible explanation of what occurred, but where the allegations have not been tested by a full published investigation and judgement. In other cases, such as the British Airways-Loganair dispute, judgements have been imprecise as to the existence of predatory practices. Indeed, there appear to be no instances of fully-fledged investigations which have ruled that successful predation took place in the airline industry.

Despite this lack of a large number of case studies, allegedly predatory behaviour should not be ignored. Of particular concern is the response of national airlines, which are backed up by substantial amounts of state aid, to the operations of low-cost carriers in the newly deregulated European market.

Finally, it should be noted that where action is taken, investigations need to be reasonably speedy, otherwise they will not be completed before successful predation has occurred. A complication is that individual victims will have little incentive to complain if the investigations will not actually protect them (especially if they receive no compensation if predation is proven after their demise). Of course, regulatory agencies and courts of law also need to be very wary of unsuccessful entrants who plead predation as a source of self-inflicted woes stemming from their own commercial mistakes. In addition, new entrants cannot expect existing firms to acquiesce to their presence without a competitive response.

### *Code-sharing*

There has recently been a considerable upsurge in the number of strategic alliances involving international airlines (Gallacher, 1994; Humphreys, 1994*b*). To date, some 136 airlines worldwide have formed more than 280 alliances. Code-sharing forms an increasingly important element of their development. For example, up to May 1994, there were 56 partnerships between United States and foreign carriers, of which 44 were still active. Moreover, there were 89 separate agreements, of which 76 were active, and many of these covered several city-pairs.

Code-sharing involves the use by an airline of its designator code on an aircraft operated by another airline which itself uses its designator code on that aircraft. This can result in a single, common or combined, air carrier designator code for two or more air carriers for a certain flight connection, although the connection, or individual segments of the connection, are only operated with aircraft of one of these carriers. It is promoted as a marketing device by the airlines and used to integrate their schedules and operations with those of other airlines. It can encompass connecting flights of one carrier which are offered to the public as the flights of another carrier.

Code-sharing was initially designed in the United States domestic market to circumvent some of the constraints of the pre-1978 Airline Deregulation Act period. What code-sharing now tries to do is give the customer the impression of an on-line service or, at least, offer many of the features of an on-line service. These features include flight schedule co-ordination, through-ticketing, single check-in, through-baggage handling, proximate gate locations and frequent flyer programmes. It provides a higher quality of service than does interlining. It also means that in some cases, where blocked space arrangements exist, service in a market may be maintained where neither code-sharing

partner would generate sufficient profit individually. Especially for smaller carriers, code-sharing has become an important strategy for the survival of their services.

From the airline perspective there may be cost advantages as well as marketing benefits if the code-sharing allows for the more efficient use of joint resources, such as check-in facilities and personnel. In addition, code-sharing provides a mechanism which allows airlines to reap additional benefits from "network value" without the requirement to physically expand their network of operations. The British Airways-US Air arrangement, for example, can hypothetically provide a network serving 17 000 city pairs, the United-Lufthansa-SAS arrangement a network of 55 212 city-pairs and the KLM-Northwest arrangement a network of 36 450 city pairs. In some specific instances, such as the KLM-Northwest and United-Lufthansa alliances, the system also extends to anti-trust immunity in the United States which permits the setting of joint fares at once and avoids the need for the setting up of official prorates in arm's-length negotiations.

At the international level, code-sharing can allow carriers to access behind-gateway feed traffic despite restricted cabotage rights, nationality clauses in bilateral agreements and constraints on foreign ownership. For example, the code-sharing agreement between KLM and Northwest on the North Atlantic affords the former the opportunity of offering on-line services to interior points in the United States while the latter has improved access to the European Union market, the Middle East and beyond. Northwest can now, for example, market services to over 30 cities in Europe and the Middle East while only flying to 4. The overall impact of this has been that the airlines' share of trans-Atlantic traffic has risen from 7 per cent in 1991 to 11.5 per cent in 1994. From a commercial point of view, code-sharing may also be more attractive than other options, such as mergers, since it can be limited to those segments of airline activities where there are positive marketing synergy effects.

Recently, concern has been expressed about the impact of code-sharing on the ability of other carriers to compete. There are also arguments that without adequate disclosure code-sharing may mislead air travellers by giving the impression they will be served by one carrier when the service is actually provided by another (Shenton, 1994). Codes of conduct now often require computer reservation systems to indicate clearly where code-sharing is being practised. For instance, the European Union system specifies each flight option can only be listed twice but the US CRS rules are silent on the subject. Moreover, even within these codes there is still concern that enforcement has not been complete and screen clutter remains (Beyhoff, 1995).

Another matter of concern is passenger liability. Code-share flights are regarded as successive carriage flights under the Warsaw Convention and thus passenger liability rests with the carrier with whom the passenger enters into a contract (although the actual carrier may have liability under the Guadalajara Convention). Potential problems arise when the operating carrier has different contractual terms on liability from the code-share partner. Japanese airlines, for instance, have abandoned limits on compensation whereas US and European carriers normally have limits of about \$75 000. It matters, therefore, who is legally performing any particular flight under any code-sharing arrangement. Given the use of such devices as block space agreements as part of code-share arrangements, the question of liability becomes even more complicated.

Code-sharing alliances pose problems for empirical analyses. A small number of studies have, however, now been completed, and others are nearing completion (*e.g.* by the European Union), exploring the various issues surrounding code-sharing, but to date only limited evidence is available as to their importance. The North Atlantic route has been the subject of most attention.

What seems to be emerging is that some code-sharing agreements have influenced the performance of the airlines involved, while others have produced much less of an impact (Dresner *et al.*, 1994). The impact of the code-sharing also depends on the changes in operation which accompany the code-sharing arrangement. The dual designation system adopted by Swissair and SAS, for example, was accompanied by significant rescheduling, with resultant customer benefits (Youssef and Hansen, 1994). The outcome of any alliance also depends on how well it is structured and, in particular, if it meets a clear market demand (Coltman, 1995).

The outcome of a code-share is also influenced by the networks which are being linked and the initial market power of the carriers involved. A study of the USAir-British Airways and KLM-Northwest code-sharing arrangements on the North Atlantic route (Gellman Research Associates, 1994) illustrated the differential effects which code-sharing can have on the participants, other carriers and on airline users. It did this by calculating the profits generated (the net producer surplus) by the code-share and the consumer surplus implications for passengers. The impact of code-sharing is seen to be affected by the details of the scheme. It can, for example, affect the distribution of traffic between carriers, especially if the code-sharing is unidirectional (*e.g.* for the study period British Airways was putting its code on USAir flights but not vice versa, and therefore reaped the producer surplus) and they also determine benefits generated for consumers. It was estimated that the British Airways/USAir code share generated an annual benefit to users and participating airlines of \$15.6 million and the Northwest/KLM alliance a surplus of \$29.5 million. Unfortunately, what this study did not do is to allow for new traffic generated by code-sharing, and it relied on a very limited data set. Additionally, code-sharing is in its infancy and future developments may modify the results obtained. Code-sharing is also closely tied in with other commercial practices, such as frequent flyer programmes, which makes isolating its effects problematic. The increasingly common practice of joint shareholdings (*e.g.* KLM has a significant shareholding in Northwest's parent company) adds to these problems of separation.

A more extensive study of code-shares involving US carriers (United States General Accounting Office, 1995) supports the finding that code-sharing generates large gains for partners in terms of both passengers and revenue. In many instances, such as the United and Ansett Australian Pacific code-sharing arrangement, the number of code-sharing passengers had exceeded the airlines' expectations. In this case the alliance contributed \$14 million of the \$521 million operating profit earned by United in 1994. The gains are found to expand as the sharing arrangements become more global and operations (including frequent flyer programmes) become more integrated. What the study also finds, however, is that there is insufficient evidence to date to determine the effects of code-sharing on fares or on the longer-term level of competition in the market. It is difficult, for example, to separate generated traffic from that diverted from other carriers when a successful alliance develops.

Analysis outside the United States is more limited. In Europe British Midland estimates that off-line business now accounts for about 11 per cent of revenue, a large proportion of which can be attributed to code-sharing (Civil Aviation Authority, 1995*b*).

From the empirical studies which are currently available, therefore, it is extremely difficult to generalise about the competitive effects of code-sharing. As a recent Civil Aviation Authority (1994) study points out, the overall Virgin-Delta blocked space arrangement on US-UK routes would, on the one hand, seem to be anti-competitive since the carriers account for about 20 per cent of the total market while on the other hand at the route level, Delta would be marketing its seats in competition with Virgin on routes where it had no previous presence. The increasing number of studies which have been initiated by governments and international bodies, however, reflects the concern that exists about possible anti-competitive aspects of the practice. It is an area where further monitoring is required. Experience from other industries where similar issues arise, however, suggests that if more systematic policing of code-sharing is felt necessary, then this would require a multicriteria approach (OECD, 1986).

### *Mergers*

While strict scale economies are not deemed of major importance in the international aviation market, mergers can generate both cost savings through scope and density effects and, via network value, increased revenue flows. Indeed, merger activity is almost bound to be prominent in the period following regulatory liberalisation. A positive reason for this may be the need to replace structures created in an environment of regulation with new organisations responding to market demands. The resultant increase in market concentration, however, has the potential for distorting competition. A number of factors may temper this concern in practice:

- The existence of competition from non-scheduled carriers, most notably charter operators, where the degree of market concentration is less. This is likely to be most pronounced in non-business markets where the demands of users do not require the attributes of a scheduled service. The extensive charter market in Europe provides such countervailing forces. The scope for such forces on long-haul routes, where traffic is thinner, seems much more limited.
- The existence of indirect competition provided by operators using different hubs or routes. This has clearly become a major element in the competitive environment now found in the US domestic market where competing service networks have emerged. The scope for such network competition over short-haul markets, such as those found in the European Union, would seem much smaller because they are less suited to hub-and-spoke types of operation (Civil Aviation Authority, 1993*b*). On the other hand, indirect competition already exists on many long-haul routes, such as the North Atlantic.
- The existence of competing modes of transport, such as high-speed rail. The experiences of the Paris-Lyon route and the high-speed rail services in Japan (Yamanouchi, 1995) provide evidence of the ability of alternative modes to compete with aviation where market conditions are appropriate. The development

of the Trans-European Network of high-speed rail for the European Union may also provide further competition at the international level. The scope for competition on international routes elsewhere is less certain, especially given that the distances over which high-speed rail seems to have a competitive advantage suggest that it is more suited to linear than network competition.

There is also the institutional response to mergers. The quest for market power through mergers is, of course, not a phenomenon unique to international airlines. There are institutional arrangements in all OECD countries designed to ensure that mergers are not to the detriment of the wider economy. The issue, therefore, is not so much the question of whether it is possible to handle the potential problems created by airline mergers, but rather how they are taken into account at the national level. Mergers policy at the national level naturally focuses on the national interest rather than that of international aviation markets. Even where there are supranational arrangements, these are limited. While the European Union, for example, has mechanisms for handling large-scale mergers, and has used them in the context of the aviation sector, these are only concerned with the potential anti-competitive effects within the Union.

### **3. Infrastructure issues**

Infrastructure costs represent a significant element in the overall cost functions of airlines. They also need to be set in the context of the generally low level of profitability in the sector. The ICAO estimates that airport and route facility charges amount to about 6 per cent of total airline operating expenses. Differential access can influence the competitive position enjoyed by competing carriers. A level, competitive playing field requires that neither access nor charges are distorted to the competitive advantage of specific airlines. In practice, there are several areas where this is often not the case.

#### ***Airport user charges and slots***

Infrastructure access, both in terms of the rates charged for use and the physical access afforded to airlines, affects the terms upon which carriers can compete. In particular, for airlines to compete fairly, including new airlines with existing carriers, this means being able to offer services at popular times from popular airports (Jones *et al.*, 1993). Inappropriate handling of constraints on capacity, coupled with inequitable treatment of airlines, can frustrate other efforts to allow the development of international aviation (Doganis, 1992).

Efficient utilisation of airport capacity requires appropriate charging which should be cost-based (International Civil Aviation Organisation, 1967). At present, the level of landing charges varies mainly according to factors such as the size or weight of the aircraft. Terminal charges are levied separately, typically on a per-passenger basis. The different charges paid by different sizes of aircraft generally transcend variations in the costs which are associated with their size. The main explanation for this seems to be the lower elasticity of demand generally associated with the longer-range flights involving

larger aircraft. Congestion costs are, with limited exceptions, not embraced in the calculations of airport tariffs.

A notable exception is the peak-pricing model used at Gatwick and Heathrow in the United Kingdom (Civil Aviation Authority, 1992). Here tariffs vary by time of day and by season and are based upon a flat rate irrespective of aircraft size. In 1991, for example, at Heathrow a Boeing 747 on a peak period international flight was charged £10.72 per passenger (assuming a 65 per cent load factor) and £2.49 off-peak while a smaller aircraft, such as a Short 330, faced an international charge of £20.17 per passenger and an off-peak charge of £4.01 (Civil Aviation Authority, 1992). Despite this charging regime, however, full congestion costs are not recovered and the demand for slots at Heathrow exceeds supply. Athens also initiated differential landing charges in 1991 with an additional 25 per cent charge during the period June to September for landings between 11.00 and 17.00.

To cope with congestion, over a hundred of the world's airports have airport scheduling committees and conferences, most of which operate under rules established by the IATA. These rules focus on grandfather rights and "use it or lose it" criteria, and give priority to scheduled services, but there is also directed discretion. Capacity is shared out between airlines for periods of six months according to these rules. Since the timing of the slots allocated may not correspond to the specific needs of airlines, slot trading takes place to ensure more suitable matches of take-off and landing times. While this is normally undertaken within a barter structure under the auspices of the scheduling committees, in the case of four major United States airports (Chicago O'Hare; New York J.F. Kennedy; New York La Guardia; and Washington National), slots for domestic flights have been bought and sold.

The barter process allows advantage to be taken of some trades of mutual interest but the procedure is cumbersome and involves significant transaction costs. Monetary trading may, in some instances, offer a more efficient and flexible approach. The challenge is to develop monetary trading procedures which preclude the banking of slots, and their subsequent sale at inflated, monopoly prices, and which ensure the continuation of regular services to airline users. Also, the issues surrounding the initial allocation of tradable property rights to slots would have to be taken into account.

### ***Handling charges and regulations***

Airport charges and ground handling costs can represent a significant element of an airline's overall cost – amounting, for example, to 10 to 20 per cent of total operating costs on typical one- to two-hour intra-European sectors. These costs also differ quite substantially between airports and, again taking the European case, the Association of European Airlines argues that ground handling is up to 30 per cent more expensive at airports where there is no competition in the ground handling market. The United States General Accounting Office (1994), in a survey of 13 European and Pacific Rim airports, found that 9 restricted choice of ground handling services by either prohibiting the airlines from performing these services themselves or designating specific agents to supply the services.

Table 4.1. **Airport and handling charges at European airports  
(in 1993 ECU for scheduled A320-100 service)**

	Airport-related charges per turn-around	Handling costs per turn-around adjusted to reflect labour cost differences	Airport-related charges and handling costs per turn-around
Amsterdam	1 953	1 372	3 325
Athens	2 003	2 815	3 629
Bilbao	847	1 883	2 463
Brussels	1 612	1 611	3 210
Düsseldorf	1 671	1 582	3 389
Faro	1 391	4 468	3 124
Frankfurt	2 052	2 656	4 936
London Gatwick	1 145	1 030	2 160
Madrid	986	2 053	2 748
Manchester	1 952	943	2 881

*Source:* Derived from Doganis and Lobbenberg (1994).

Some support is given to these assertions by the data in Table 4.1 where effective ramp handling monopolies pertain at Athens, Bilbao, Düsseldorf, Faro, Frankfurt and Madrid. The table provides details of the airport-related charges and handling costs (adjusted to reflect different national labour costs) associated with operating an Airbus A320-100. While services offered may differ to some extent, nevertheless a pattern emerges which suggests that charges are higher at the monopoly facilities, especially in the four cases where the national flag-carrier holds the monopoly rights. At a more macro level, data from the IATA indicate that there are also wide differences across major regional markets, with airport charges in Europe being about three times those in the United States.

Charge differentials clearly affect entry and exit, but they may also influence the nature of competition within the international aviation market. For instance, they put those airlines which make use of 6th freedom rights and predominantly operate from high-cost airports at a competitive disadvantage to those whose network is mainly in markets where costs are lower. These are also costs which are outside of the control of the airlines. The issue is not so much whether some charges should automatically go up or down but rather to ensure that airport facilities are provided efficiently and that charges are cost-related. These are requirements even if there are important safety and other factors that argue against universal self-handling at the ramp.

#### **4. Direct intervention issues**

Aviation markets are some of the most regulated markets in the world. The terms of competition between suppliers are governed not only by wide-ranging policies of social

regulation (*e.g.* with respect to safety and the environment) but also extensive economic regulation. Both forms of regulation, social and economic, influence not only the competition for the market but also competition within the market. The focus here is principally on matters involving social and competition policy but these are matters which, in particular, cannot be divorced from those of entry and exit policy.

### *Air service agreements*

The system of bilateral air service agreements has been discussed in some detail in Chapter 3. Indeed, it is here that their main impact lies in the 1990s. Nevertheless, bilateral agreements can have implications for competition once entry matters have been determined. This is because the current regulatory system of air service agreements can, in economic terms, be interpreted as a form of co-ordinated competition policy. The bilateralism involved in the structure, however, introduces some special features.

Markets, in this case, are defined in terms of a set of routes between the two countries involved in the bilateral negotiation with third-party involvement kept to a minimum (Hewitt, 1994). Preferential trading arrangements will then generally be based on some rules of origin. The usual rule in merchandise trade is that the item be primarily constructed in a partner country. Air transport is, however, a service and what moves across borders is not a finished product but the capacity to provide the service. A rule of origin of the type applied in merchandise trade is difficult to apply, and instead the current system relies on a rule of ownership. The bilateral agreements recognise airlines of other countries as long as those airlines are substantially owned and effectively controlled by the citizens of those countries. Under most agreements, on any one route, there will be competition between the designated suppliers. Depending on its intensity, fares tend to fall to clear the agreed capacity. This is more likely the more carriers there are on the route – in other words, where there is multiple designation.

Expectations of the performance of the regulatory process can be derived from a variety of models. One model stresses its capture to promote the particular interests of the firms involved. In such a model, not only are there caps on the entry of third parties, but also the countries involved agree to regulate the growth of the capacity of their own carriers. Studies of other sectors where there is significant protection afforded to the suppliers, such as banking and energy, provide evidence that undertakings take advantage of this in terms of not maximising levels of X-efficiency (Button and Weyman-Jones, 1992).

The problem of potential cost escalation can be worsened when the designated airline is a nationalised flag-carrier. While it is particularly difficult to isolate the implications of ownership from the regulatory environment in which a supplier operates, there is mounting econometric evidence that private ownership, in general, can positively affect economic performance (Button and Weyman-Jones, 1994). Specific work in aviation which goes beyond simple description is limited, but there is evidence from the experiences of British Airways and Air Canada that competition involving carriers with at least 51 per cent private ownership does significantly enhance their economic performance (Eckel *et al.*, 1994).



The extent to which capture occurs can vary between routes. This was very much the pattern which existed in the older types of bilateral agreements where, for example, single designation and revenue pooling were common on some routes. More liberal air service agreements, especially those involving multiple designations, reduce the problem but could still limit efficiency if low-cost, third-party carriers cannot compete. It is important to note that the third parties who have been able to win access to routes between other countries may be able to earn profits on those routes if they are relatively low-cost carriers. The introduction of British Midland on several short-haul European routes has illustrated this.

The presence of quota rents stemming from imperfect competition also complicates the process of organising regulatory reform. Countries with only small populations and small economies in absolute size have stronger interests in a more open regulatory system. This has recently been illustrated in the European context by the willingness in 1995 of several small European countries to sign liberal bilateral agreements with the United States (United States Department of Transportation, 1995). In the bilateral system, where countries have property rights over their own origin-destination traffic, countries with larger traffic volumes can end up with smaller total output. Larger economies, or those in which the size of the market is large relative to the current scale of operation of airlines based there, may have less incentive, if their carriers are not commercially strong, to support a more open system.

### *Anti-trust immunity*

Aviation has traditionally been regulated, but often this regulation supplanted the normal competition law that applied to other industries (OECD, 1992c). In the United States, for instance, aviation has been given limited exemption from anti-trust laws for actions which could otherwise be unlawful to the extent they were authorised by the Department of Transportation. The granting of such immunity to the Northwest-KLM, United-Lufthansa and Delta-Swissair-Sabena-Austrian strategic alliances is an example of this at the international level. It allows the airline to effectively offer joint services without fear of adverse legal repercussions.

In general, in countries where competition laws existed, these were not applied to aviation, which was the subject of transport laws. The situation has recently been subjected to change as domestic aviation policies and international agreements have been liberalised. Increasingly, general competition policy is being applied to the aviation industry. Exceptions, however, remain.

As examples, the European Union, since the first application in 1987 of Articles 85 and 86 of the Rome Treaty to aviation, has given block or individual exemptions to tariff conference activities which would otherwise violate the terms of the Treaty. These exemptions, however, are conditional and, for example, have in the past entailed conditions that incumbent airlines with a dominant position must interline, for a period, with a new entrant. The third phase of the Union's air transport liberalisation package also allows for tariff co-ordination and co-operative slot allocation procedures.

In Japan, the Civil Aviation Law specifies that the Anti-Monopoly Law should not be applied to airline activities provided that they are conducted with the approval of the Transport Ministry and that fare and rate levels are not adversely affected by unfair trade practices.

The changes which are taking place, however, reflect a shift in emphasis. Aviation policy has, in the past, essentially been seen as different from that of more general competition policy. Now the emphasis is moving towards treating aviation as any other economic sector while appreciating that it exhibits features which require specific exemptions from general competition policy or variation in the *de facto* interpretation of that policy.

This new situation poses two specific types of problem. First, national competition laws vary between countries (OECD, 1994f) – *e.g.* there are variations in the extraterritorial application of competition laws. This can lead to problems for airlines operating outside of their national territories. Second, where there are cases of aviation specific exemptions from national competition policy, or extensions of such policies to embrace particular attributes of the aviation market, there may be problems of inconsistencies in the rules applied. In some cases there is also a lack of clarity regarding which set of rules is applicable in different circumstances.

### *Financial interventions*

The ability of many airlines to compete in international markets is often supported by favourable financial treatment by governments. In some instances this may be specific to the industry (*e.g.* direct subsidies to national airlines) or, like bankruptcy laws, have a wider national coverage, but nevertheless it affects the terms of international competition. This is not merely a question of allowing entry into markets and limiting exit from it, as discussed in Chapter 3, but extends to the actual conditions of competition within the market. Favourable financial treatment (*e.g.* in terms of loan guarantees and subsidies) essentially gives carriers a cost advantage over competitors, allowing them a larger market share than could pertain otherwise. Bankruptcy protection can allow a carrier, which otherwise would have to cease operation, to continue. The justification for this type of treatment is often that while the carriers involved are inherently competitive, there is a need for restructuring which requires atypical, short-term financial arrangements.

The implications of the alternative approaches to the restructuring issue, direct subsidies and protection under bankruptcy laws, however, differ in several ways.

Direct subsidies represent a known, exogenous injection of resources into the aviation industry. There are also established guidelines as to how subsidies should be used (OECD, 1992c). These can have clear advantages when operated under regimes, such as those of the European Union, which demand transparency. It also provides, as in the case of the 10 billion ECU given by European Union national governments in aid to their carriers in the early 1990s, a process by which explicit and verifiable measures of restructuring can be imposed. Difficulties may, however, arise due to the highly political nature of the process which has the potential for distorting competition in favour of subsidised flag-carriers. Further, the process implicitly assumes that bodies such as the

European Union can make commercial judgements regarding the requirements of airlines for restructuring, as well as assuming that the conditions which the Commission imposes will be met. From a wider perspective, subsidies to individual carriers at times of industrial excess capacity also do little to resolve overall structural difficulties.

Bankruptcy law differs considerably among nations. This is not simply a question of technical detail but often one of philosophy. The US Chapter 11 structure is designed to ensure that basically sound companies continue to operate while going through a process of restructuring. Courts attempt to develop new financial arrangements. This system is similar in principle to the approach applied in most OECD countries, but its operation is somewhat different. In particular, in recent cases, protection has been afforded for a longer period. The Chapter 11 experiences of Continental (twice) and TWA (twice) provide examples of this phenomena. This is because the underlying presumption is that factors outside of the control of a company can lead to it having a need for restructuring. It therefore effectively gives incumbent management time and incentive to seek new means of staying in business. The UK situation, in contrast, is much less forgiving on existing operators and provides a rapid mechanism for the transfer of resources to other owners (Westbrook, 1990). Both in their ways can bring about restructuring without the injection of additional, non-commercially justified resources into the industry. In the case of the US system, however, there is less scope for other, solvent operators to acquire the resources of bankrupt suppliers (Bradley and Rosenzweig, 1992).

It is also often claimed that the Chapter 11 approach leads to bankrupt carriers continuing to operate with artificially low cost structures. This in turn has the potential for adversely affecting the performance of other operators which would otherwise be able to recover their costs. Some analysts point to the tendency this has towards introducing instability into the market-place (Telser, 1994). Empirical study of the effects of alternative bankruptcy laws on the performance of aviation markets is, however, scant and mainly relates to the US aviation. Borenstein and Rose (1995), for example, provide the most detailed study of Chapter 11 to date and conclude from their analysis of four case studies that while prior to bankruptcy carriers often reduce fares, thereafter they do not introduce further cuts while competitors generally maintained fares or increased them. The bankrupt carriers do not, on average, gain market share. What this study of the *ex post* consequences of Chapter 11 does not consider in detail, however, is the extent to which airline behaviour prior to insolvency is influenced by the nature of the bankruptcy system.

Direct subsidies and bankruptcy arrangements, therefore, seem to have quite different effects for the aviation industry. At present, while it is possible to describe the various implications of each, there is no strict basis for quantitative comparisons. There is a need for the development of a common measure of the intervention effect along the lines of the producer and the consumer subsidy equivalents devised by the OECD for agriculture (Anderson, 1994).

In addition to financial injections, international aviation is the subject of numerous taxes. In some instances these are effectively earmarked and can thus be seen as a form of user charge (*e.g.* air transport taxes in the United States which go into the Airport and Airway Trust Fund and the 18 franc safety tax in France which goes to pay for passenger

security). The long-term expansion of the sector combined with the relatively inelastic nature of the demand for its services, however, makes it, in political terms, a logical target for sumptuary taxation. Taxes, however, place an additional cost on operators in the industry and a burden on users (Lipman, 1995).

In themselves, taxes are necessary to finance public expenditures of various types but public finance theory suggests that this finance should be raised in the least distortive manner possible. There are inherent dangers that a sector such as aviation may suffer, in terms of long-term financing, if it is simply treated as a cash cow by finance ministries. Difficulties also come if taxation distorts competition in the market by artificially favouring some suppliers. In the context of international aviation, this may occur if competing modes (such as high-speed rail in Europe) are taxed in a preferential manner to air transport.

Actually isolating the implications of any tax regime for the competitive positions of carriers within any international market is difficult. This is, in part, because of variations in the levels of each tax across countries. It also raises broad questions of isolating taxes from user charges – an issue taking on increased importance as fiscal instruments become more frequently used as part of environmental policy (OECD, 1989*b*). At present, there is no established methodology for exploring the implications of taxation on the competitive positions of different airlines. In the longer term, as liberalisation continues, the importance of devising such a methodology will grow.

### *Environmental issues*

At the local level, access to airports creates congestion and imposes a variety of atmospheric pollutants on adjacent residents. Take-offs and landings are noisy although increasingly less so with the development of engine technology and Chapter 3 requirements. Indeed, environmental factors have often influenced the development of air transport infrastructure, especially airport constructions and expansions, and the ways in which it may be operated (Hieronymi, 1993). At the global level, commercial aviation has been estimated, because of its production of some 500 tonnes per annum of carbon dioxide, to contribute about 1.25 to 1.5 per cent of greenhouse gas emissions (British Airways, 1994). Emissions of nitrogen oxide at some altitudes is thought to affect the ozone layer in the middle atmosphere. At lower levels it can contribute to the acid rain problem. Recently, the United Kingdom Royal Commission on Environmental Protection (1995) also expressed concern about the potential damage caused by ice crystals in the stratosphere from aircraft exhausts.

Because environmental resources are not traded in markets, many of these environmental aspects of international aviation are external to the industry's own cost calculations. There is, therefore, the need for government policies to ensure that the environmental damage done by aviation is not excessive. In economic terms the marginal cost of additional environmental damage to society should not exceed the marginal benefits of additional air transport (Button, 1993). The optimal level of damage may be attained using either fiscal measures (*e.g.* carbon charges) or command-and-control measures (*e.g.* emission limits) or a combination of the two. Such policies are now being developed

at the international level as well as often being national priorities. The acceptance of the OECD's (1975) polluter-pays principle is one example of such an international effort.

A major concern is that unilateral national policies regarding the environment can affect conditions of competition. International controls, such as the policy of phasing out noisy, Chapter 2, aircraft in Europe (by 2002), the United States (by 1999) and some other areas, while having differential effects on airlines because of their fleet composition, are designed to establish an environmental level playing field. Actions by individual countries, however, have the potential for discrimination between airlines. This may come about, for example, in terms of differential curfews at airports or where there are national variations in environmental standards. To meet Chapter 3 noise requirements, for example, is expensive, with the option of hush-kitting a DC-9 costing in the order of \$1.75 to 2 million and a B737-200 costing \$3 million, plus higher fuel costs, and confers on operators which do not have to conform to the requirement a competitive cost edge. The measures also take time to implement which means that any sudden policy shift, once a deadline is fixed, disadvantages those carriers which set out early to meet a standard. It also distorts the aircraft market.

There are also questions concerning the way in which aviation should be treated in overall environmental policy. The agreement reached at the Earth Summit in 1992 to limit global emissions of carbon dioxide, for instance, left national governments to formulate their own strategies to meet the targets set. Differential approaches to meeting this target (*e.g.* variations in the ways governments treat different industrial sectors) will influence the competitive positions of airlines. Policies which affect carbon dioxide emissions directly, such as a carbon tax have, for example, different implications to the imposition of *pro rata* cuts across each industry in a country.

### ***Safety and security issues***

There has been a long-term decline in the number of fatal accidents in international aviation as technology has evolved and official safety standards have been developed. Aviation is also safer, on most criteria, than other forms of transport.

In order to contain the problems of accidents, a body of safety regulations and codes of conduct have been developed. These are, in general, administered separately from the economic regulations which govern entry and exit and competition although, since they impose costs on the airlines and on infrastructure suppliers, they impinge upon the way the aviation market operates. What is sometimes feared is that in a highly competitive situation there may be an incentive for airlines in commercial difficulty to circumvent safety regulations in order to develop a competitive edge.

The evidence which is available provides little support for these fears in terms of safety. There are several reasons for this result:

- Governments in OECD countries have established strong regulatory agencies to oversee safety requirements, which are themselves the subject of ICAO appraisal. Additionally, within major economic areas, such as the European Union, there are further institutional arrangements to ensure a high, standardized set of safety regulations.

- Safety rules often enter into air service agreements and unacceptable national safety rules can affect the willingness of governments with more stringent rules to participate in bilateral agreements with other countries where safety standards are less well developed.
- Where there have been major shifts to competitive aviation markets there is no evidence that this has resulted in a deviation from long-term trend improvements in safety. The US domestic market, for instance, has exhibited a continued downward trend in accidents since the 1978 Airline Deregulation Act. In the decade to 1987, for example, for large airlines flying jet aircraft, accidents declined by 36 per cent, fatal accidents by 40 per cent and fatalities by 32 per cent compared with the period 1970 to 1978. Further, there seems to be no evidence that new jet carriers had worse safety records than incumbents (Kanafani and Keeler, 1989).
- There is evidence that airlines suffer financially if they are perceived to be potentially unsafe carriers.

With regard to safety rules, the ICAO is responsible for developing International Standards and Recommended Practices. These, however, have traditionally taken time to be implemented and there is a tendency for divergence to appear at the international level. At present, for instance, it has been estimated by the United States Aerospace Industries Association that non-harmonized United States and European civil aviation rules add some \$500 to 700 million annually to the cost of international air travel.

From a competitive perspective, differential rules, or variations in the *de facto* operation of codes of conduct, can affect the way an international carrier operates its fleet – certification of an aircraft type in one national market does not mean its automatic acceptance in other markets. Multiple certifications are now required so that aircraft may be operated by airlines of countries other than those of the aircraft-builder. These multiple certifications add considerably to the cost of developing and producing aircraft. Many of the differences in certification criteria between countries do not address basic safety issues, but are rather about more peripheral issues and are more matters of form rather than substance. The harmonization efforts of the US Federal Aviation Administration and the European Joint Aviation Authority provide a good example of the type of co-operation necessary to reduce the costs of certification without reducing any aspect of safe operation.

In addition to safety issues, international aviation has been subjected to several forms of security concerns ranging from sabotage to hijacking. Extensive security arrangements involving airline operations, airport facilities and air transport control systems now surround international aviation in all OECD countries. The strong impact security issues can have on the demand for air transport has been strikingly shown during and after the Gulf war. There is, on the other hand, no evidence that the institutional organisation of international air transport markets has a major bearing on the level of security of international aviation. Security arrangements are normally treated separately to matters of air transport policy *per se* and, therefore, their effectiveness depends upon the intensity and nature of the security system employed.

## **ISSUES OF STRUCTURAL ADJUSTMENT IN INTERNATIONAL AVIATION**

### **1. Differing base positions**

Previous chapters dealing with entry and exit issues and the functioning of competition have highlighted both the nature of the international aviation market and the institutional environment in which it operates. They have shown that, while the sector has changed over time, there are constraints over the ways that it may respond both to market developments and to institutional changes. This is in the context of an industry which is being confronted by changing patterns of demand and new technologies. To meet these challenges, the international aviation industry must, like other industries, continuously adjust (OECD, 1987).

The aviation industries of different countries, however, have a number of distinguishing features, which means any process of structural change will not commence from the same starting point. Part of the variation relates to inherent differences in comparative advantage, and this forms the very basis of desirable trade. Part of it, however, is not market-based but rather stems from institutional arrangements (involving such things as subsidies, legal monopolies, etc.). Reforming these arrangements is not, however, easy. As Levine (1995) has pointed out, choices are limited by history, geography, infrastructure and commercial realities. Overall, however, until agreement is reached on how to handle the existing unevenness of the playing field, these are serious problems for an industry which is seeking structural adjustments to meet the demands of a globalising economy and new institutional arrangements.

Historically, many of the issues of this type were relevant to other sectors where structural adjustment has proved necessary. For example, the car industry suffered from differences in the size of domestic markets, there are heavy sunk costs associated with the steel industry, and shipping has suffered severe financial difficulties at various times (OECD, 1987). It is, therefore, not so much the items on the list of obstacles to restructuring which are the key issues but rather the variations in the intensities of the individual obstacles.

## *Market environments and regulatory frameworks*

International aviation is not a homogeneous industry. Airlines, for a variety of historical, institutional and commercial reasons, differ in size and structure. In some cases, these differences arise from the interaction between the economies of domestic aviation and the economies of international aviation. For example, the large domestic market in the United States has fostered, among other things, the creation of particularly large hub structures and network carriers. Airlines from smaller countries do not have the benefits of operating in a large domestic market, which may put these carriers at an initial disadvantage in providing networks of services. However, some small-country operators, such as KLM and Singapore Airlines, seem to have largely overcome this shortcoming by developing extensive 6th freedom rights.

The airlines of different countries also vary in their cost structures. Part of the variation in operating costs may be the effect of the level of currency exchange rates; another part may be explained by the nature of the markets involved (*e.g.* in terms of length of haul). But even when due allowance is made for such features, significant differences in economic efficiency between airlines remain (Distexhe and Perelman, 1994). Some of these variations in efficiency can be explained by factors such as economies of experience or be due to economies of market presence, but others stem from institutional factors, such as the availability of subsidies and the protection afforded by ownership. Additionally, there are disparities in the level of management efficiency, often the result of inadequate commercial incentives. In other words, some variations in operating cost are institutional in origin rather than market features.

These differences can pose political problems for restructuring since they inevitably mean that any rapid contraction in demand or change in the institutional framework may result in some airlines contracting or ceasing to exist in the market. These are, however, problems common to all dynamic situations. The restructuring of the automobile industry in the late 1970s and the 1980s, for example, saw both changes in the firms supplying the market and in the geographical distribution of production (OECD, 1983). The outcome is a more efficient automobile industry. Competitive pressure and commercial incentives stimulate labour and other factors of production to move either to the expanding suppliers or to alternative sectors.

Institutional arrangements differ across international markets. Although the emergence of global alliances has reduced the impact of these variations, there are still clear differences between markets which are subject to multilateral arrangements (such as the international market among European Union Members) and those where bilateral agreements continue to exist. But even within the latter, bilateral air service agreements exhibit wide variations (*e.g.* in terms of the number of airlines designated and capacity allowed) and, in many cases, contain confidential agreed minutes. This makes it difficult to integrate various regional and local airline markets.

Regulatory frameworks also interact with longer-term market trends. Aircraft markets, for instance, have been swinging from periods of glut, with many aircraft available on the market, to periods of scarcity. In recent years aircraft manufacturers have significantly reduced production lead times; nevertheless, long lead times and the inability to



forecast demand accurately make such swings likely. The situation is aggravated if operators are regulated to prevent them from varying frequency or capacity. Such regulations often lead to airlines deploying suboptimal aircraft fleets.

### *Social air services*

Aviation has traditionally played an important role in providing transport services to remote areas and as a unifying force across large, sparsely populated regions. Governments have sought to provide air services within their territories for social, political and regional economic development purposes. A diverse range of regimes exist to finance such services. Until recently in the majority of the OECD countries, because the state owned the main airlines, social air services were provided as part of the carrier's mandate. In many instances regulatory structures have implicitly embraced this role of air transport by fostering cross-subsidisation of services. More recently, as domestic systems have been the subject of regulatory reform, direct subsidies (such as the US Essential Air Services Program and the national regimes permitted under the European Union's Public Service Obligations – e.g. the Spanish services in the Canary Islands, Balearic Islands and Melilla) have become more common.

Social service obligations have been less common at the international level other than in the context of linking specific regions or areas to the wider, international economy. They function much less as a social service than as instruments in economic development policy. This, for example, is the rationale of the Greek and Irish social service obligations. This is also explicitly recognised in European Union policy where they do exist, and are deemed to have a valid long-term role to play in providing a social function. There are questions of how to fund them during structural change and what level of funding to provide.

In providing social air services, governments increasingly rely, as far as possible, on market forces to minimise the extent of subsidy payments, to allow for flexibility in service levels to small communities which are more vulnerable to cyclical downturns in traffic, and to encourage the development and growth of all classes of airlines so that scope and density economies may generate efficiencies at all levels (OECD, 1987). The social air services programmes now in operation by the United States, Australia and Canada, for example, all require a competitive bidding process for carrier selection in cases where subsidies are required.

There is still, however, diversity in the ways in which civil, non-financially viable air services are funded. Even where policies of regulatory cross-subsidisation have given way to direct subsidies, there remain problems with the comparability of financing structures. The evidence from other sectors is that financial assistance can take a variety of forms, but that it is possible to develop general guidelines which offer a measure of comparability. This type of methodology is typified by the indicators developed by the OECD to examine agricultural policy interventions (Anderson, 1994), but has not yet been applied to aviation.

## 2. Financing structural change

Structural adjustment is not a costless process. It requires the reallocation of resources and the integration of new resources into the economic structure of suppliers. It is particularly difficult in sectors such as aviation which are relatively capital-intensive although, unlike many other sectors where structural change is occurring, the dynamic nature of the industry and its high growth potential do lessen some of the more severe implications. Nevertheless, issues such as limitations associated with sunk costs and the need for adequate finance do influence air carriers' attitudes towards structural adjustment.

### *The issue of sunk costs*

International aviation involves the use of a substantial amount of capital, some of which is sunk in the sector. It is, in other words, not readily transferable for uses in other economic activities. In many other dynamic sectors where structural change has occurred, such as broadcasting (OECD, 1993*e*) and telecommunications (Meyer and Tye, 1985), the existence of large amounts of sunk costs has influenced the paths of structural change which have been pursued. Protection from the transaction costs of restructuring is often sought by those who have developed their capital base under different market conditions or under a previous regulatory regime.

Airlines as a whole, for instance, may have invested in fleets more suited to the old market or institutional structure than to the new. In some instances, because of restrictions on flight numbers there has been a tendency for regulatory regimes to result in the use of large aircraft, while more liberalised short-haul markets are often best served by smaller aircraft (Lortie, 1995). Change, therefore, can leave carriers with fleets ill-matched to new market conditions. The natural reaction of those adversely affected is to seek some form of transitional protection so that at least some of the sunk costs may be recovered. The extent of market rigidity should not, though, be exaggerated, since there is an active worldwide market for used aircraft of all sizes.

The issue is, at one level, a distributional one (Gordon, 1981). Structural change in most types of industry leaves an "overhang" of sunk costs which must be borne either by those who carried out the initial investment or, by limiting the speed of the reform process, by consumers and new investors who are deprived of the benefits of the new regime. In adopting a particular approach to this issue, however, there may be implications for the longer-term outcome of the reform process. Indeed, if inappropriately designed, government intervention may inadvertently frustrate the ultimate economic or political goal of change. It may, for instance, reduce the scope for new technologies being introduced or lead to inappropriate signals being sent to related sectors (*e.g.* to those providing aviation infrastructure).

The desirability of allowing time for appropriate restructuring, while at the same time ensuring that efficient use is made of sunk assets, underlies many of the arguments for subsidies to airline operators and for protective arrangements under bankruptcy law. There is an inevitable danger that subsidy and bankruptcy regimes may result in

inefficiencies due to the direct misallocation of the resources into inappropriate restructuring programmes. They may also have serious secondary effects if, by diverting traffic, they lead to lower revenues among other operators which could restructure more efficiently.

### *Availability of funds*

While the available data are subject to relatively wide margins of error, there is no doubt that commercial aviation as a whole suffered major financial losses in the early 1990s. The ICAO reported net profit margins for the world airline industry of -2.2 per cent and -1.8 per cent for 1990 and 1991, respectively. The United States scheduled carriers as a group accounted for a combined operating loss of \$2.5 billion in 1992, which should be set in the context of a worldwide loss of \$1.5 billion experienced by ICAO airlines (International Civil Aviation Organisation, 1994a). While a significant part of the losses was in domestic aviation, international markets also suffered. The IATA estimated, for example, that its members lost \$15.6 billion between 1990 and 1993, with only a token profit of \$1.8 billion in 1994.

The financial situation varied by routes and by carrier. Many airlines have suffered from cash flows which have not been sufficient to cover self-financed investment. This does not, of course, mean that all airlines have experienced losses over the period. Some, such as British Airways, Air New Zealand, and Singapore Airlines, have been consistently profitable. Equally, some airlines such as Lufthansa, KLM or Northwest Airlines, while showing poor performance in the beginning of the 1990s, have managed to effect a much quicker turn-around than others.

The severe losses suffered in the beginning of the 1990s have been largely attributed to the worldwide economic recession and the impact of special factors such as the Gulf War. The difficulties were compounded by over-optimistic investments undertaken by many airlines in the late 1980s. However, while cyclical swings and special circumstances have been important determinants, it appears that, in recent history, market peaks and troughs have become more pronounced (Maldutis, 1993; Mullan, 1995). The long-term financial performance of airlines has been clearly determined by a secular decline in yields which has only partially been offset by a decline in costs. For the period 1960-90, for example, yields dropped by 2.2 per cent per annum for passenger traffic and by 3.4 per cent per annum for freight, while unit costs only fell on average by 1.9 per cent per annum.

An important consideration is whether this situation is sustainable. The International Air Transport Association (1992) has estimated, for example, that an operating surplus (before interest and taxes) of 6 per cent per annum on international services is needed to finance future requirements. This compares with an annual surplus of less than 2 per cent over the past twenty years. The upturn in the world economy in the mid-1990s, coupled with internal efficiency improvements, has eased the financial position of many airlines, although there are still very pronounced differences in the performance of individual carriers (see Table 5.1). It is also not clear that even this improved performance is sustainable in the long term. The operating surplus of international operations of IATA

Table 5.1. **Financial performance of major airlines in 1995 (\$ million)**

	Operating revenues	Operating profit (loss)	Net airline profit (loss)
<b>North America</b>			
Air Canada	3 284	200	38
Canadian Airlines Int'l	2 288	(20)	(142)
American	16 910	1 015	196
Continental	5 825	385	224
Delta	12 194	661	320
Northwest	9 085	902	342
Southwest	2 873	314	183
United	14 943	829	349
USAir	7 474	322	119
Aeromexico	686	41	(22)
Mexicana	816	69	(244)
<b>Europe</b>			
Air France Group	7 957	83	(580)
Alitalia	4 645	45	1
British Airways	12 143	1 139	740
Iberia	3 616	202	(361)
KLM	5 953	282	342
Lufthansa	13 904	585	1 031
SAS	4 962	671	357
Swissair	5 941	201	(125)
<b>Asia/Pacific</b>			
All Nippon Airways	10 031	288	(89)
Japan Airlines	15 026	180	(94)
Qantas	5 315	636	134
Air New Zealand	1 826	181	165

Source: *Airline Business*, September 1996.

members was only 4.8 per cent in 1994 and, although a surplus of 7.8 per cent was earned in 1995, the long-term trend is well below that needed to match the returns IATA feels are adequate for a sustainable airline industry.

The ability of an industry to meet its long-term investment needs is also determined by the structure of its financial liabilities. Declining operating margins of many airlines have led to a significant rise in debt-equity ratios over past years. Across United States carriers, for example, the debt-equity ratio more than doubled between 1978 and 1992. Although these data suggest that in the past access to credit has not been a major problem for the airline industry, it is questionable whether in the future debt financing would be available to the same extent. In the longer term, high debt-equity ratios are only tolerated in industries with relatively stable cash flows and little temporal change in their earnings performance. This is not a situation found in international aviation. Capital markets are increasingly perceiving the inherent risks as witnessed by the development of US airline

shares, which in early 1996 were traded at a 55 per cent discount to the general stock market index.

The complexity of the situation is compounded by the need for the industry to retire old aircraft (*inter alia*, in the light of stricter environmental norms regarding noise levels) and to invest in new capacity to meet projected demand. While estimates suggest that improvements in load factors and aircraft utilisation, combined with the projected use of larger aircraft, mean that fewer planes will be required to cope with any given future traffic level – *e.g.* it is predicted that by 2005 the 1990 volume of traffic could be handled using 37 per cent fewer aircraft – this must be set against the fact that the total volume of business will increase significantly. Boeing forecasts that nearly 12 000 aircraft will be delivered over the next twenty years at a total cost of \$857 billion (1992 prices), and the ICAO has produced a figure of \$800 billion for the period 1991-2000.

To some extent the financial problem has been cushioned in the short term by developments in the wider aviation market. Aircraft manufacturers' progress in cutting production lead time, for example, has increased the flexibility of airlines in placing aircraft orders. There is also an increased division between ownership of hardware in the sector and the provision of aviation services. Many airlines now lease rather than purchase aircraft, and aircraft manufacturers themselves now often provide tailored financial packages to facilitate the purchase of their products. The overall adverse financial position of the sector as a whole, including the production of hardware as well as air service operations, may therefore not be so severe as basic airline statistics suggest. The key issue is whether this framework is capable of coping with market restructuring.

A sound financial foundation clearly increases air carriers' scope for undertaking structural change (OECD, 1987). The concern is that this does not exist at present in international aviation (Mullan, 1995). The Comité des Sages for Air Transport (1994), for instance, pointed to a possible "35 per cent funding gap" between the flow of finance into the European industry and the cost of restructuring, even if traditional modes of financing were to be improved. The situation differs in other geographical markets because of variations in the organisation of their financial institutions. A further problem has been the financial difficulties encountered by the aircraft leasing companies, which have made them more cautious in their leasing practices to airlines. This poses particular problems in the longer-haul market where, because larger aircraft are less easily redeployed, leasing companies tend to charge a premium.

### **3. Infrastructure constraints**

Scarce airport and air traffic control capacity can have a significant impact on the pace and shape of the restructuring process in international air transport. On the institutional side, for instance, economists' predictions about the structure of the United States' domestic airline industry following deregulation in 1978 were frustrated by scarcity of capacity at some airports. Equally, in Europe, constraints on airport facilities and air traffic control systems have proved to be a brake on the creation of a more liberal market.

Similar constraints related to aircraft movements and terminal capacity would likely play important roles in affecting the future restructuring of the international airline industry.

### ***Aircraft movements***

Airspace congestion can impede carrier operations and affect restructuring. European airspace, for example, is tightly constrained and controlled through an outdated structure of national ATC centres, and this will place increasing limits on carrier freedom of movement and carrier costs. On North Atlantic routes, for example, there are already 600 flights per day. Since this airspace is not controlled in a real time sense, there are operational limits on carriers which force them either to fly at less attractive times, or to fly routings with higher costs. In the immediate future, the problem may be contained, since more efficient routings should be possible through the use of satellite technology.

Airport congestion, which is a problem in a number of countries, may also impede the restructuring process. Because of indivisibilities, for instance in runway provision, growth in airport capacity is unlikely to be in step with carriers' demands for take-offs and landings. Lengthy decision-making processes add to the problem of providing more capacity within this constrained situation. The commercial advantages of scale, scope and density of operations, but in particular market presence, can provide the incentive for incumbent airlines to further concentrate at hubs. These features limit the flexibility for structural reform of existing carrier networks and can impede market entry.

Further, at some airports, aircraft parking constraints are more severe than capacity. The new Munich airport, for example, is already close to peak hour parking capacity while the terminal facilities are only at 73 per cent utilisation. At many airports, and for air traffic control and air navigation services, prices charged to carriers vary with the size of aircraft while costs do not vary as much, if at all. The implication is that there are price incentives which favour operation of small aircraft over large. This can affect the types of service which are commercially viable and establish wrong incentives in the light of capacity constraints.

### ***Passenger and cargo throughput***

Terminal facilities are just as important as airside access. In Australia, for example, access to domestic terminal gates has been a serious impediment to structural adjustment as the historic two-airline policy gave rise to a system of domestic terminals at major airports, most of which were built by the two airlines to service their own needs and are leased long-term by these airlines. New entrants must therefore either negotiate access to space in those terminals or negotiate the provision of additional terminal space with the airport operator.

Several airports have serious constraints on processing through customs facilities. With staffing levels for customs and immigration dictated by general government budget concerns and not by demand for services, these can become binding constraints. The need to meet security requirements within terminal buildings not designed with high levels of security as a priority adds to these difficulties.

The efficient functioning of the air transport system also requires reliable and predictable access to airports. In many countries the capacities of existing access roads no longer meet the requirements of increasing traffic volumes. Added to this are environmental considerations limiting expansion of road access. Countries seek to reduce this problem by integrating airports into the long-distance railway network and/or by linking airports to rapid transit train systems or underground. Although the number of airports linked to rail services is steadily increasing, due to the long construction time of rail systems problems of airport access will persist in many countries.

All of these types of infrastructure constraints can impede the operation of airline markets and can affect the structure of the industry after major shifts in technology, the emergence of new patterns of demand or regulatory liberalisation. In particular, regulatory liberalisation might lead to additional constraints on infrastructure, thereby frustrating the beneficial effects of increasing competition. The evidence from the United States is particularly clear about the effect of infrastructure constraints on market structure. Morrison and Winston (1989) claim that this may be the single most important factor which has led to suboptimal market performance, and Levine (1987) and others have documented the consequences for industry structure. In Europe, airport congestion is regarded as having the potential of impairing the competitive process, as witnessed by Council Regulation No. 2408/92 giving the Member States the possibility of intervention in cases of serious problems of congestion.

#### **4. Institutional issues**

The actions of governments and international agencies can have a significant impact on restructuring. At one level, governments, through appropriate competition and regulatory policies, can prevent obstacles to structural change from developing. Linked to this, at a more dynamic level, macroeconomic policies promoting steady economic growth remove some of the uncertainties which may make market participants reluctant to restructure their activities (Michalski, 1983). In some circumstances, however, governments may act directly either to slow the rate of structural adjustment or to direct it in a particular way (OECD, 1987).

A particular problem with structural adjustment in internationally traded goods and services is that countries often seek to protect their own suppliers, either in the hope that they may survive as long-term players, or to control – and often slow – the restructuring process. From an overall economic perspective, there are limited benefits but considerable costs associated with such actions (OECD, 1985). Protecting an industry or firm which is structurally moribund may confer, in some circumstances, limited short-term gains in retention of employment, and may meet other objectives such as limiting foreign exchange outlays and ensuring security of supply.

The significant costs of protection result in suboptimal factor allocation, high prices for consumers, and lower overall efficiency of the economy. Additionally, delayed restructuring may impose much higher costs when adjustments ultimately have to be made. Further costs may arise if national protection of an industry causes similar

retaliatory policies by other countries. In terms of international aviation, institutional arrangements which limit supply or impose high costs deprive a country of efficient air transport services. The overall effect of protectionist measures in the air transport sector might, therefore, lead to longer-term distortions in the wider economy and an ultimate weakening in the economic growth potential. In particular, they can impede the developments of transport-intensive sectors such as, for instance, international tourism.

Whether those in the international aviation sector will respond to the opportunities arising from technological advances and new managerial practices, as well as to broader changes in economic circumstances, will depend upon the intensity of competition, and on the incentives that competition creates for airlines, airports and others in the sector to adjust successfully – and on the severity of the penalties for those that do not.

The current regulatory structure, especially through its implications for competition, includes a number of challenges for structural change in international aviation. Air service agreements can be one such impediment, especially if they restrict both the capacity on routes and the freedom of operators to tailor their services to demand. The initiation of regional and more liberal bilateral agreements has removed some of these impediments. But there are also less direct and explicit issues, namely matters relating to airline ownership and to differing national attitudes to competition policy, which have the potential of impeding the restructuring process.

### *Ownership issues*

When industries restructure, the ownership of firms frequently changes. This may, for example, include mergers and acquisitions, but can also embrace changes between public and private ownership. Government ownership of an airline may prevent restructuring of the industry via merger or other equity-based means. If a government is unwilling to sell, market-based restructuring can be frustrated. But, in addition to that, it is important that there is flexibility of ownership even within the privatised sector, to ensure airlines are of optimal size and can serve optimal networks. There are numerous instances in recent history of ownership changes in aviation markets which were domestically liberalised:

- In Canada, liberalisation resulted in the consolidation of six small carriers into one, Canadian Airlines International – a carrier of sufficient size to be able to compete with the dominant, government-owned carrier, Air Canada.
- In the United States, domestic regulatory reform resulted in numerous mergers and acquisitions. For example, Pan American, which had been confined only to international routes, purchased the domestic carrier National, and subsequently many of its international routes were taken over by Delta.
- In New Zealand, the international carrier was merged with the domestic carrier prior to liberalisation. Thereafter, and following liberalisation in the first half of the 1980s, the merged carrier was privatised.
- In Australia, domestic deregulation resulted in the government-owned international carrier (Qantas) acquiring the government-owned domestic carrier (Australian).



Canada offers interesting examples of the role of ownership regulation. First, because of restrictions imposed by the government of Alberta on the regional airline PWA Corporation, CP Air, the trunk carrier which became the nucleus of what was to be Canadian Airlines International (CAI), was, in 1987, unable to acquire PWA. Instead, small PWA had to acquire the much larger CP Air, and this may have been an excessive burden. PWA Corporation came close to bankruptcy in 1992, had to cancel interest payments and restructure its debt. Second, even today, the same ownership restrictions prevent a change in management of the carrier. Not surprisingly, perhaps, PWA Corporation shares trade at a very low price-earnings multiple relative to the other Canadian or US carriers. Third, privatisation of Air Canada has resulted in significant efficiency gains. Today, Air Canada's per-seat costs are within the range of rival Canadian Airlines, having reduced what had been a significant unit cost gap (Gillen *et al.*, 1989).

As these cases demonstrate, the ability to restructure efficiently often depends on ownership freedom. As a result of more liberal ownership rules, combined with a rising number of multinational airline alliances, in many countries the traditional "flag-carrier mentality" has begun to erode. Despite this gradual liberalisation of ownership in most countries there remain, however, significant constraints on foreign ownership of air carriers (see Chapter 3).

Foreign ownership restrictions are often difficult to change unilaterally. By way of a hypothetical example, under 1992 European Union rules, Portugal must allow a German-based but Irish-owned airline to fly from Munich to Lisbon. This appears to have broken through the ownership barrier. That carrier, however, need not be accepted by any non-European Union nation for designation to fly a route outside the European Union. Bilateral agreements between Germany and, say, Australia, could normally require any airline flying from Germany to be German-owned and -controlled. It would not even be clear whether this German-based but Irish-owned airline could be designated from Ireland to serve Australia. Easing of ownership restrictions within any group of nations will only be effective for carriers which confine all their flying within this group. Without a wider liberalisation of ownership rules, it seems unlikely that any significant industry restructuring on an international scale can take place.

### ***Applicability of competition rules***

As airline markets make structural adjustments to less-regulated environments, it is important that the restructuring be guided by competition law (van Hasselt, 1994). Otherwise, the resulting industry organisation and consequent market performance could be less than optimal from a competitive standpoint. In the past, national competition rules have formed the basis upon which restructuring may take place. Many of the world's leading international air carriers, however, now operate almost exclusively in international, not domestic markets. KLM, Singapore and SAS are only three examples. Even carriers with large domestic markets, such as Air Canada and Qantas, derive more than half of their revenues and traffic from international routes. This underscores the importance of ensuring that principles of international competition law do not impede industry restructuring.

Competition policy is intended to address issues (OECD, 1993*f*) such as:

- abuse of dominant market position;
- predatory pricing;
- information problems;
- interference with competition in downstream markets or distribution channels by practices such as tied selling;
- interference with competition in upstream markets, such as vertical integration to obtain control over key resources;
- horizontal mergers aimed at creating market power.

At the domestic level, many nations have a regulated conduct exemption for air transport from the application of competition law, or certain elements of the law. The rationale is that, in some instances, directed regulations will deal more effectively with aviation-specific competition matters. This exemption is to prevent needless duplication of regulatory authority (OECD, 1992*c*). Similar exemptions also may apply in nations using government ownership of enterprises as a policy tool.

With domestic liberalisation, the process of transition can be relatively straightforward. When passing the relevant deregulation legislation, the new law either makes clear the precedence of existing competition laws, or alternatively simultaneously modifies the competition laws to make clear their applicability to the now deregulated industry. Where agency jurisdictions overlap, this is clarified. In the United States, airline merger review under the 1978 Airline Deregulation Act was assigned to the Department of Transportation until 1989, at which time it was phased out in favour of the Justice Department review under general anti-trust laws. In Canada overlapping jurisdiction still prevails, with merger reviews being conducted separately by the National Transportation Agency and the Bureau of Competition Policy.

With liberalisation of wider international markets, applicability of competition law is often less clear. This is a generic problem of applying competition law to international enterprise, that is not specific to air transport:

- A number of nations, such as the United States, take the view that their competition law applies to conduct outside their territory if it affects their international or domestic markets. Many other states, however, do not recognise this form of extraterritorial power.
- Some nations' general competition laws specifically exclude applicability to multinational enterprises.
- Some nations have ambiguity in their laws and have either chosen not to test the law in court, or have not had the opportunity to do so. Canada's decision not to pursue application of competition law in a potential merger of a Canadian with a foreign small aircraft manufacturer might be viewed as a case of the former.

In air transport, ambiguities in the international application of competition law certainly exist. A case in point is the inability of the United Kingdom to challenge the joint services agreement between Qantas and British Airways, although the Trade Practices Commission of Australia did have such authority and has reviewed the agreement. Competition suits by Virgin Atlantic against British Airways are being pursued in United

States courts, not in the United Kingdom. The Canada-United States liberal Air Service Agreement of 1995 calls for the application of competition law in each of the countries. Coupled with US extraterritorial application of its laws, this may be satisfactory, but many other cases could arise where ambiguity would exist, and thus would need to be clarified.

With the emergence of an international airline industry characterised by cross-border co-operation, joint ventures and alliances, the need for consistency and predictability in the application of competition rules has greatly increased. Unclear and conflicting competition rules may create uncertainty regarding the extent to which co-operative activity is lawful, thereby compromising the efficiency of the restructuring process. Compliance with two or several sets of rules can expose airlines to substantial additional cost, in particular when they affect the formation of international alliance networks and the development of code-sharing operations (Association of European Airlines, 1995).

Against this background it appears desirable that OECD countries embrace the general guidelines recommended by OECD Ministers (OECD, 1992*d*), namely to seek to improve consistency between policies to enhance competition and market access; to provide a foundation for convergence of substantive rules and enforcement practices in competition policy; to identify better procedures for the surveillance of trade and competition policies; and to enhance the interests of consumers.



## TRANSITION OPTIONS IN INTERNATIONAL AIR TRANSPORT

### 1. Notions and challenges of transition

Transition is viewed here as the institutional counterpart to restructuring. While restructuring involves the ability of a sector to adjust its productive activities to meet the challenges of new demand patterns, managerial innovation and technical change, transition is concerned with the institutional reforms which are required to ensure that structural change in international aviation can take place efficiently and effectively. The institutional changes may embrace not only legal reforms but also *de facto* reinterpretations of existing institutional arrangements.

While transition can be distinguished from restructuring, there are inevitable inter-relationships. For a sector to restructure in order to meet evolving market conditions there may be a need for institutional change. This institutional change may require substantial adjustments to the legal framework. Equally, as an industry restructures itself, it influences the institutional interpretation of regulations and can create conditions for further, unanticipated institutional change. This latter linkage has manifested itself, for example, in sectors when a series of regulatory reforms have been needed to deal with the outcomes of privatisation (OECD, 1992c).

Transition has a temporal element. In the short term it may involve changes within a given institutional structure. For example, in the international aviation context this may mean the retention of the bilateral structure, while adapting it to embrace new freedoms, such as the growth in multiple designations, code-sharing and other co-operative agreements, and the creation of new 5th and 6th freedom rights. This represents a *de facto* change and is very much what has occurred over recent years in international aviation. Over the longer term, however, transition may entail changes to the general institutional structure itself. This involves major *de jure* changes and not simply marginal reinterpretations of the existing system or adjustments to it. This is, for instance, the way that the development of the aviation market within the European Union may be interpreted with its shift away from the bilateral structure of air service agreements and the initiation of a multilateral regional system (regionalateralism).

Transition in the international air transport sector poses a number of problems. Perhaps the most important of these stems from the different approaches that countries

have towards the role of markets. These amount to two different schools of thought on the extent, degree, and nature of government intervention in markets. The free market school puts emphasis on market principles, with intervention limited to cases where significant and demonstrable market failures, such as extensive monopoly power, outweigh the potential inefficiencies of government involvement. Alternatively, the interventionist school assumes that control and regulation is desirable except in instances where the market can clearly be demonstrated to meet policy objectives more effectively.

What both approaches highlight, though, is that there is a need for government monitoring of the sector. In the case of international aviation, as pointed out by Brittan (1990), greater freedom to price and to enter markets may heighten economic efficiency by reducing costs, but it can also give scope for airlines and others to act in anti-competitive ways. From the broad policy perspective the issue is always one, therefore, of the relative emphasis placed on the importance of cost efficiency and that placed on the anti-competitive behaviour which can develop in markets.

In international aviation, the approach traditionally has very much been biased in the direction of the interventionist school. The Chicago Convention of 1944 produced policies whereby decisions on entry, pricing and other service aspects were left to administrative processes rather than to the market. In part this stemmed from the non-commercial objectives which influenced policy formulation at the time and the desire of many countries to allow a more balanced supply of services to develop after the Second World War. It also reflected, however, concern in some countries that, given the existing structure of the industry, the market would not be capable of providing an efficient economic outcome.

More recently, as witnessed by developments such as the liberalisation within the European Union and the increased number of less restrictive bilateral ASAs, the focus has shifted. This may be seen as part of a wider paradigm shift among OECD countries away from the interventionist school and towards seeking increased consumer benefits and overall economic efficiency by fostering market forces. Many countries still seek to achieve non-economic objectives in their international aviation policy (*e.g.* the exercise of national sovereignty), but increasingly, in practical terms, economic efficiency criteria are dominating and the virtues of a more liberal framework of regulation are being gradually accepted as a means of attaining increasing benefits to consumers and the economy at large. This does not mean totally free markets are being adopted, but rather that policy is being designed to reap the benefits of more liberal regimes.

## **2. Transition strategies**

There is growing experience concerning the alternative ways in which transition may be approached as the lessons of new international bilateral arrangements are learned and regional multilateralism has taken place in some markets. The experiences of domestic transitions also provide guidance to the merits of different strategies (*e.g.* Rossell, 1995).

From the broadest perspective, there are a variety of ways of approaching transition. To some extent all have been partially adopted in different markets, including aviation markets, over recent years. By broad perspective is meant the overall strategy and implementation of the transition process rather than the details of the changes which take place. At one extreme, there is what may be thought of as the “Big Bang” approach with reforms suddenly being initiated in a single package. Another approach is to have a predetermined phasing-in of change, whereby the overall set of institutional reforms are initiated according to a clearly defined timetable. Alternatively, change can be evolutionary, with each stage in the process being developed from the experiences of previous phases. There are several detailed variants on these themes.

The “Big Bang” approach, whereby there would be a sudden and comprehensive change in the institutional framework governing international aviation, is an extreme case. The main advantage of this approach is that it removes some of the first-mover advantages which some airlines may enjoy in a phased change. The approach may also, in some cases, involve lower transaction costs, as players need only adjust to the new position once. The disadvantages stem mainly from the possibility that the institutional changes may be flawed and consequently seriously damage the development of the sector. It also imposes heavy burdens on those in the sector who – for a variety of reasons, *e.g.* relating to existing institutional frameworks – start from a more disadvantaged position than others. Finally, there are difficulties because of variations in national legal systems which impinge on aviation but are of a broader nature and cannot be readily changed to meet developments in any individual sector.

In practice, given the multidimensional nature of issues surrounding aviation, the “Big Bang” approach in its pure form is an unlikely option. A more realistic approach is that of phased change. Phasing-in of measures has the advantage of allowing airlines and others to plan their strategies. Phasing can also be developed in such a way as to address carriers’ fears arising from different competitive starting points. Predetermined gradualism does, however, have the disadvantage that it may not keep pace with changes in the market system. It may also provide time for entrenched interests to develop strategies to protect their positions in the new institutional environment.

An important variation of the gradual approach is phased institutional change with no clearly pre-defined sequence of changes – the learning-by-doing approach. This, for instance, was the pattern adopted by the European Union, whereby there were three main packages of measures each in themselves independent and not fully preplanned. This has the advantages of the more formally phased approach, and additionally allows for learning effects derived from the experiences of previous packages. It does, however, introduce a degree of uncertainty about the nature and timing of subsequent changes, and problems may arise over the implementation of each stage (Civil Aviation Authority, 1995*b*). It also provides scope for game-playing by those involved as they lobby policy-makers for particular types of change in each package.

A further dimension to this issue is the way transition in international aviation fits within the more general transition arrangements that are taking place in world trade. International aviation services have been embraced as an annex to the General Agreement on Trade in Services but only in a very limited way (Katz, 1995). At present the annex

includes no hard rights and only covers three doing-business issues: aircraft repair and maintenance services, the selling and marketing of air transport services, and CRSs. In practice even these elements have not been fully adopted in the short term, and of the first 26 nations to sign GATS, 25 have asked for Most Favoured Nation exemption regarding selling and marketing; 24 have done so for CRS and 3 for repair and maintenance. Further, GATS is not permitted to reduce or affect a member's obligations under bilateral or multilateral agreements already in effect, and GATS dispute procedures cannot be invoked until those under existing ASA arrangements have been exhausted.

The advantage of a GATT/GATS-style strategy on transition in international aviation is that developments in aviation can be combined with those in other sectors. This offers the opportunity in international trade negotiations to move forward on a much broader front and to improve efficiency across a range of sectors. Countries, for example, which have traditionally pursued the protectionist approach to aviation policy may be willing to adopt a more liberal approach regarding this sector provided that they expect an overall increase in welfare from the liberalisation across several sectors. The trade-offs may involve commodities as well as other services.

Where there are practical difficulties with GATS, as seen by the claims for exemption from its civil aviation elements, is with, in particular, the Most Favoured Nation principle. This states that a signatory must extend the trading rights afforded in its most liberal agreement with another country to all other signatories. This does not involve reciprocity; therefore, if a country negotiates an extremely liberal bilateral ASA with another, then other signatories may freely enter this market without any corresponding relaxation of entry or other controls over their own skies. It essentially poses a free rider problem. Countries that are in a strong bilateral bargaining position will, therefore, be rather reluctant to bring civil aviation under a GATS framework.

Additionally, there may be serious problems with the National Treatment principle, whereby a trading partner must accord to service suppliers of other countries treatment no less favourable than that which it accords its own service suppliers. This could imply the opening of national aviation markets to cabotage, which would probably prove unacceptable to larger countries unless there was a wider liberalisation of international markets. In addition to these problems of general obligations, there are specific commitments in the GATS framework, such as might relate to market access and rights of establishment, and these can be applied in a variety of ways. States are effectively confronted with a matrix of options as to the modes of supply in meeting these commitments. The potentially large number of possible options can make the process unwieldy and may reduce the prospects for liberalising international air transport within the GATS framework.

While GATS has to date had minimum effects on international aviation, over the longer term it may prove to have a useful supplementary role in helping to expand liberalisation initiated through bilateral and regional structures to a larger number of countries (Marconini, 1995). It also fits into an established framework of international arrangements which have enjoyed success in liberalising trade in goods and, to a more limited extent, services.

A number of detailed possibilities for this future role of GATS exist. For instance, the development of reciprocity within the aviation sector, possibly through more



liberalised and harmonized bilateral air service agreements, could subsequently be extended to embrace conditional applications of National Treatment principles. Following from this could be the automatic implementation of the National Treatment principle and the extension of this regime from the aviation sector framework to a multi-sector framework, and from a bilateral structure to a wider geographical approach.

### **3. Paths of transition**

At the detailed level, the institutional arrangements covering international aviation embrace a number of key areas. As shown in the earlier chapters, each set of institutional arrangements involves its own set of issues and characteristics. Equally, each of these areas provides scope for a variety of transition paths, and these are outlined in turn below.

#### *Air service agreements*

The regime of bilateral air service agreements has undergone considerable change in recent years. The traditional bilateral structure has given way to a multilateral system within the European Union and parts of South America, and a series of open skies arrangements have resulted in more liberal bilateral agreements between some countries. Further, in many cases the more traditional bilateral agreements have increasingly included features such as multiple designations.

Such changes have been needed to cope with rapid technical changes in the sector and increased demands for air services. As seen in Chapter 2, however, there are likely to be further developments, especially on the demand side, affecting the market for aviation services. In order to accommodate for the inevitable uncertainties inherent in this, and to improve the efficiency of international aviation, it is important that appropriate institutional changes take place. Bilateral ASAs remain a central element of the institutional framework governing international air transport, but will need to continue to evolve to meet the challenges of the coming decades.

In the recent past, airlines have often sought ways to reduce the commercial problems which restrictions in bilateral ASAs have imposed on them. In particular, the creation of strategic alliances – involving, among other things, code-sharing and cross-ownership arrangements – has now become one of the important features of the international air transport sector. Because of their greater flexibility, alliances may have distinct advantages over other possibilities to extend route networks, such as internal expansion, mergers or acquisitions. In markets constrained by existing ASAs and ownership restrictions, however, they are often the only available commercial option. Thus, while in many instances strategic alliances may represent the most efficient way of realising synergy effects between carriers, there may be situations where a merger or acquisition would be more effective. If these latter courses are not permitted, an alliance becomes a second-best option.

In many cases, alliances – or particular features of alliances – are, however, only accepted as part of a wider negotiating process within the bilateral structure, which itself

can impose other restrictions. Equally, alliances are dependent upon carriers finding partners with reciprocal interests. Additionally, because of their looser nature, alliances bear a greater risk of breaking up, for instance as a consequence of a change in ownership. The very high number of failed alliances not only reflects the learning process which is taking place, but also suggests that the synergy effects may sometimes be smaller than expected (Coltman, 1995). Therefore, while airline alliances have introduced a substantial amount of flexibility into the system, they have their limitations.

There are two broad approaches to further developments in ASAs – additional refinements to the bilateral system, and the creation of multilateral systems. Further, within this dichotomy there are several variations, and all have associated with them advantages and disadvantages. Doganis (1993) offers more details on some of the bilateral options and Kasper (1988) and Levine (1993) look at some multilateral possibilities.

The main options, together with the pros and cons, are as follows:

- *Existing regimes of bilateral agreements* where there is considerable diversity in the nature of the arrangements across routes, and where not all details are always transparent. This is an established system which has evolved since the Chicago Convention. It has the advantage of being flexible in its implementation and allows countries to retain traditional controls over their airspace. In practical terms it is a system countries are familiar with, and one in which change is generally relatively straightforward since it does not entail a large number of consenting parties. However, since it focuses on individual routes or small sets of routes, it can lead to difficulties in arriving at a high level of efficiency over networks of international aviation services.
- *Liberalisation within bilateral frameworks* whereby, when bilateral agreements are renegotiated, specific provisions using defined standard terms may be incorporated. Such provisions might include open route exchanges, multiple designation, capacity freedom, fare freedom, complete 3rd and 4th freedom rights, and so on. This type of approach enjoys the benefits of introducing a degree of uniformity into the existing, quite disparate system of agreements without disrupting their basic structure. The problem is that there may be few common concepts of practical importance which all or a significant number of countries would accept.
- *A lead sector* approach whereby specific markets, such as cargo or charter services, are liberalised first, with these providing a basis for subsequent liberalisation of other services. The advantages here are those of improving efficiency in fields where there is some common ground for agreement, and in providing demonstration effects for a subsequent widening of the liberalisation process. In particular, with the increasing blurring of the distinction between charter and scheduled services and the strong growth in air freight traffic, liberalisation of charter and cargo markets could have significant add-on effects.
- *Corridor liberalisation* where participants over one or more major corridors – such as the North Atlantic – seek to liberalise that particular market. This can be seen as a spatial variant of the lead sector approach, but has the added problem that it may involve agreement across a number of countries. It is also difficult to envisage mechanisms whereby liberalisation of one corridor extends to others, apart from indirect demonstration effects.

- *Region-to-region arrangements* which entail negotiations between groups of countries which have common interests in international aviation, e.g. NAFTA countries and European Union Members, to bring about a single localised aviation market. This would allow groupings of nations to come together and exploit more fully the liberalisation that has already occurred inside the groupings. There is, though, the potential problem that it could result in large regional blocs excluding countries which are outside of regional groupings.
- *Open skies agreements* where airlines of the contracting parties may compete openly for international traffic. This may itself take several forms, ranging from the more limited bilateral open skies policies currently being pursued by the United States to completely free access among a group of countries. This general type of approach has the strength of allowing domestic markets to be regulated independently of international markets.
- *Phased multilateralism* (plurilateralism) which involves a gradual branching out from a single core of states which initiate open skies-type transport markets – new members either needing the agreement of existing participants or joining simply by agreeing to the terms in place. It would allow like-minded member states to come together fairly quickly and avoid forcing reluctant states into a rapid change in policy. The latter could join whenever they feel it is appropriate. It has the disadvantage that the states involved may not be contiguous, causing difficulties with non-participating neighbours. Further, given the economies of international aviation, non-member countries might find it difficult to develop sufficiently their own airline industry to join the core states at a later stage.
- *Full multilateralism* where in every participating country it is possible for an airline to compete for passengers regardless of its nationality. This would entail the opening of cabotage to all carriers as well as freedom to supply services in international markets. This is the ultimate free market situation which may yield maximum economic efficiency but would be politically difficult to introduce globally in the near future because of the loss of sovereignty that it entails and the probable unequal spread of benefits which would result. There are also practical problems in attaining changes to any large-scale multilateral agreement once it is reached. The experiences of recent GATS negotiations highlight some aspects of this difficulty.

The various approaches are not, of course, mutually exclusive. Combinations of, for example, phased multilateralism, regional arrangements and more liberalised bilateral agreements could offer the possibility of more rapid change. One could, for example, see the existing regional arrangements extended to current non-members (e.g. as with expansion of the European Union arrangements, which already include Norway and Iceland, to other non-EU countries) while at the same time permitting the experiences accumulated to be harnessed for liberalisation across the regional groupings. Those outside of these structures would then have the opportunity, if not wishing to fully participate, to negotiate bilateral agreements in the form they wish. The key point is perhaps the need to avoid doctrinaire solutions but rather to seek pragmatic ways forward.

While liberalisation removes some of the requirements for complex and potentially rigid administrative structures, a policy embracing a more flexible institutional structure may eventually require new approaches to conflict resolution. For example, the existing bilateral arrangements which cover much of the international aviation market do not require extensive and sophisticated conflict resolution facilities – the states concerned reach mutual agreements. ICAO, which has been given a role as arbitrator in the Chicago Convention, has hardly been used in the past in case of disputes. A more liberal market, whereby various forms of multilateral agreements are emerging, could present new challenges in this area. At present there is no agreed mechanism or institution which has been established to deal with conflicts which may emerge. The institutions which do exist (*e.g.* within the European Union) are regional in their coverage, and there are clear problems in the ways in which, for example, relations with countries outside of the region are handled. The question of who has jurisdiction over the external aviation policy of the European Union Member States which emerged in 1995 illustrates this.

### ***Ownership***

Matters relating to ownership in international aviation are important in three distinct ways. These concern issues of public/private ownership, regulations governing levels of foreign ownership of airlines, and potential problems which could stem from flags-of-convenience operations.

As discussed in the chapters on entry and exit issues and structural adjustment, the possibility of changes in ownership may be important in ensuring that greater flexibility is introduced into future international aviation. In addition, ownership controls over airlines can have important implications for countries' aviation policies. There is a tendency for countries to be protective of carriers which are based in their territories and to direct their international policy on matters such as ASA negotiations and subsidies accordingly.

There is a trend towards more private ownership of major international airlines within the OECD area to reap the efficiency benefits which this can achieve (*e.g.* the privatisation of British Airways in 1987, the public sale of shares in Qantas and Lufthansa in 1995 and the large number of small private airlines now offering scheduled international services). Air transport infrastructure has also been the subject of limited privatisation. The main airports in the United Kingdom were, for example, privatised in 1987 and there are initiatives in, for instance, Canada and Germany to transfer at least some airports to the private sector. Equally, privatisation of ATC systems has recently been considered in the United Kingdom and in the United States. Such policy reviews have been motivated by a desire to enhance the management efficiency of existing infrastructure, including the setting of clearer objectives, and to provide additional resources for financing investment in new infrastructure.

Allowing more private ownership in the international air transport sector is likely to facilitate the restructuring process. Privatisation increases the general efficiency of international aviation and removes many of the channels of intervention based on public ownership which have traditionally been used by governments to support favoured

carriers. The economic benefits through enhanced decision-making on the basis of commercial criteria will, however, only arise if privatisation does lead – in addition to increased private shareholding in international transport companies – to the effective transfer of company control to private investors.

Privatisation also provides a mechanism permitting higher levels of foreign investment in international carriers. A number of countries, while seldom allowing majority foreign ownership, are now gradually transforming their laws regarding the extent to which airlines registered in their country can enjoy a degree of foreign ownership. As seen in previous chapters, this not only allows for a more efficient flow of international capital but it is also an important concomitant to other changes, for example with regard to ASAs, aimed at reducing the trade barriers in the market for international aviation services. Controls over levels of foreign ownership have been seen to restrict the efficient development of international air carriers and, in particular, the evolution of networks across international markets. Relaxation of foreign ownership rules would, in the context of strategic alliances, even when mergers are not desired, allow network synergy effects to be more fully exploited.

A further issue is that, with a relaxation of foreign ownership rules and more bilateral ASAs, there is the possibility of airlines' adopting "flags of convenience" in the way that a large part of the world's mercantile marine has done. Essentially, carriers may theoretically opt to register in states which offer low taxation regimes and where they can acquire labour and other factor inputs at the lowest cost. The emergence of markets offering wet-leasing of aircraft and crew provides a particularly flexible way for flag-of-convenience carriers to operate. Airlines could pursue flag-of-convenience registration strategies to minimise airlines' costs following the evidence that the costs of ships sailing under such flags are lower than for ships with other registrations (Button *et al.*, 1986).

This type of development may, however, raise safety, environmental and social issues as well as the concern on the part of non-flag-of-convenience countries that they will lose revenue. In some cases matters of sovereignty and the prestige of having an air carrier registered in the country are also important to nations. Some of these problems, such as tax revenue dilution, are common to a wide range of industries and pose problems to policy-makers that extend beyond international aviation. Others, for example those related to safety, security and the environment, are more specific and may require co-ordinated international policy initiatives.

The institutional challenge for international aviation is to develop ways to allow for the benefits of the international mobility of capital which, at the same time, avoids the flag-of-convenience problems. Regarding safety and the environment, however, a more liberal environment does not mean that countries forgo the possibility of ensuring that adequate standards are maintained. They enjoy sovereignty over their airspace and can use this to enforce internationally agreed standards as developed by ICAO. On the other hand, the tax haven problem is one which is not peculiar to international aviation but extends across a wide range of service sectors (*e.g.* international finance) and can be handled within a wider institutional structure.

## *Subsidies and other financial relief*

Subsidies have in the past been widespread in the aviation sector. Some remain in the form of restructuring subsidies (such as within the European Union), cross-subsidies (such as the Fly America Program to encourage airlines to participate in the Civil Reserve Air Fleet programme) and social subsidies for remote communities. While they vary in their intensity and form, the general potential of market distortion is well understood and, as a principle, subsidies should only be adopted to meet very specific objectives where there are no better alternatives. Where they are given there is also a need to ensure they are used effectively.

The current *ad hoc* structure of subsidies does little to foster overall efficiency and, in many instances, does not seem to achieve the desired sector-specific objectives. As liberalisation takes place the social and political pressures for restructuring subsidies, in particular, grow as some airlines encounter financial problems. The finance for restructuring often offered by government differs from commercial finance in that there is no default risk attached to it. In many cases it is awarded to nationalised carriers on the proviso that they meet set criteria, although by definition these are bureaucratically determined objectives rather than those of the commercial sector. In some cases, such as with aid in the European Union, the intention is that restructuring finance should not distort competition, although it is difficult to establish situations where in an economic rather than a legal sense, injections of aid on a non-commercial basis, and to selected actors in the market, does not affect aggregate supply or relative market share.

One option in these circumstances is to continue with the status quo. This is, however, inefficient and politically divisive, as government subsidies run the risk of allowing airlines to put off the necessary restructuring decisions. Maintaining the status quo has the merit, however, that as the trend towards privatisation continues the role of government in some countries as lender of last resort to airlines will naturally diminish. Privatised airlines are disciplined by the market both in their day-to-day operations and in their long-term planning. Further, where subsidies are still given for restructuring purposes, there is evidence of more stringent monitoring by governments of how the moneys are used and the increasing imposition of sunset provisions is reducing the prospects of subsidies continuing.

An important alternative transition option is to accelerate the process by which subsidy levels are reduced and to limit those which remain to be provided on the condition that certain restructuring targets are met within a predetermined time frame. To achieve this would initially involve agreement on definitions of subsidies, the development of an acceptable method of quantification of their scale, and an accepted method for allocating and managing remaining subsidies. This type of transition arrangement would be particularly relevant in the context of other initiatives designed to further privatise airlines and liberalise ASAs.

There may be a small number of cases where services provided on a non-commercial basis can be justified on social cost-benefit criteria such as the provision of minimum levels of service to remote communities. An efficient system of meeting these and similar objectives requires that there is uniformity in the criteria applied to the ways

in which subsidies are awarded, that the criteria for deciding on their need are transparent and that the subsidies are used efficiently to minimise market distortions. Institutional change is required in some markets to produce this outcome.

While most assistance for social reasons is currently given to domestic services, as liberalisation of trade occurs it is possible that more international services may be seen as justifying subsidies for unremunerative services to remote areas and the like.

A number of possibilities exist for operating social service systems. As one option, cross-subsidies across a network through the conference of legal monopoly rights on some routes could be used – but this system is neither transparent nor likely to stimulate efficiency. Subsidising transport infrastructure is a further possibility, but this may lead to distortions when facilities are used for both commercial and social purposes. Direct subsidies which are transparent and efficiently allocated may be best provided by means of tendering agreements.

Evidence from a range of sectors outside aviation, in addition to the programmes operated in countries such as Canada and the United States, indicate that local subsidy systems aimed at meeting the particular needs of individual communities have marked advantages in terms of both keeping the costs of subsidies low and ensuring that local service requirements are met. The benefits which can be derived from these subsidies can further be enhanced if they are delivered using franchising systems to ensure the most efficient carrier provides the service. This frees up resources which can be used elsewhere in the economy.

When private airlines encounter severe financial problems and are unable to obtain direct government subsidies, they may continue to operate under national bankruptcy arrangements. These arrangements differ among countries and this may lead to a degree of market distortion. In particular, they can lead to inefficient carriers, which otherwise would have to cease operations, continuing to operate for extended periods. The extent of the resulting distortions is, as seen in Chapter 3, unclear and open to some dispute. Further quantitative information on the effects of bankruptcy arrangements is required. Reforming national bankruptcy systems may, however, prove difficult as such arrangements are normally part of the general economic and legal framework of a country and not specific to its aviation sector.

### ***Competition policy***

Transition of competition policy involves two dimensions. The first is essentially domestic and concerns separating those aspects of policy which are sector-specific from those of a more generic nature. The second concerns the international dimension of competition policy and the need to reduce possible inconsistencies between national policies.

Most national competition issues, such as monopoly power, predatory behaviour and collusion, are of a general nature and transcend sectorial boundaries. Sector-specific policies are, however, necessary if an industry has particular features which make the use of general rules inappropriate or inefficient. In the case of international aviation, there are a number of areas which have attracted specific attention across a wide range of countries.

Codes of practice covering CRS displays, for example, have proved successful in reducing the problems of screen bias. While actions may have been possible in many OECD countries under standard competition policy, codes removed the high transaction costs which would have surrounded a large number of legal actions.

The transition options here essentially focus around the extent to which specific national policies relating exclusively to aviation are needed. The judgement should rest upon the efficiency of the policies themselves in achieving set objectives. Specific policies have the advantage that they can be directed at the targeted issue, but by virtue of their specificity can conflict with the objectives of the more general competition policies of a country. They may, for example, lead to alternative modes of transport to aviation being put at a competitive advantage or disadvantage. There are also questions regarding onus of proof. One option is to let that be with the industry, but this may stifle development in a dynamic sector such as aviation and be costly to administer on a case-by-case basis. The alternative is to place the burden on government. This reduces the possibility for intervention failures occurring but can pose problems in specifying legal details to restrain anti-competitive practices.

There are national variations in general competition policies which apply to the aviation sector. For example, EU competition rules apply in the United Kingdom, but air transport in that country is nonetheless excluded from laws on restrictive agreements – although it is possible for the Secretary of State for Industry to make reference regarding monopoly considerations. In Germany, prohibitions on price recommendations do not apply to associations of enterprises providing certain services in airports (OECD, 1995*d*). While there has been, since 1986, a simple exchange of notifications regarding actions in this field (OECD, 1995*e*) and a number of bilateral agreements have been signed, there is still a lack of rules at the international level. Procedures, time limits and the criteria for taking decisions, for instance, vary considerably. These are, though, general problems with international competition laws which add to the costs of trade and investment.

The transition arrangements available in this broader field are constrained by the breadth of the challenge, which transcends the boundaries of the aviation sector. The encouraging signs are that the issues are beginning to be addressed more systematically and that bilateral arrangements in competition policy are growing in number. Additionally, the deepening of bilateral agreements, ongoing work at the OECD on international convergence of competition policies, and the plurilateral framework explored by the European Union (Commission of the European Communities, 1995) may offer further ways forward.

There are several possible options for transition. One option is to allow the present process to continue. An alternative is to encourage its more rapid progress and to seek additional means to foster convergence of competition rules across states along the lines already being pursued at the OECD. This could involve, initially, a clearer definition of responsibilities regarding specific issues of competition policy. Additionally, increased transparency regarding the criteria to meet anti-trust regulations, but also in respect of the actual implementation of national competition rules, may help increase the consistency of competition policies across OECD countries. One possible path to this longer-term



situation may be through the initial deepening of regional arrangements and their subsequent widening, both through the admittance of non-members and through inter-regional agreements. Another possible path would be a multilateral one building upon existing codes and practices (e.g. such as those relating to CRS displays).

### ***Infrastructure access***

Even in cases where there are ASAs which permit services to be provided, infrastructure capacity and access constraints can still prove an impediment to the efficient provision of international air services. While airports, air traffic control systems and other key elements of infrastructure are being expanded and modernised, and techniques for managing their use are being improved, the chapter on structural adjustment has shown that, from an institutional perspective, there still exist limitations on their efficient use.

A number of initiatives have been developed in recent years to improve the institutional arrangements for accessing infrastructure (e.g. the runway slot allocation criteria of the European Union and the slot sales which have been allowed at some major United States airports), but problems remain. Focusing on the important issue of airport slot allocation, a number of possibilities exist:

- *The continuation of the existing self-regulation system* of airport scheduling committees that operates at most airports outside of the United States has the advantage that it directly involves the major players and allows airlines the opportunity to co-ordinate their landing/take-off needs across a network of airports. The limitations of the system arise because it often appears to exclude, or at least limit, the scope for new entry. Additionally, since it is not a market-based approach, the negotiated procedure involved does not adequately take into account the cost of slots.
- *The administration of slot allocation* by a regulating authority seeking to meet wider social or economic objectives than airlines is a theoretical possibility. The difficulty, however, is one of information and management. The airline industry provides a complex network of services which are dependent on the decisions of more than one airport. It would require a large bureaucracy to operate such a system given the vast details of the flight needs required. The airlines effectively internalise and minimise many of these costs under the regime of scheduling committees (Doganis, 1992).
- *The development of codes of conduct for airport scheduling committees* combines the self-regulation approach with that of an administrative structure. It permits the costs of runway slots to be more fully reflected in decision processes. Most committees already operate under the IATA criteria (e.g. regarding periods of use of a slot, ‘use it or lose it’ and grandfather rights) and, in Europe, the European Union has additional rules, notably Council Regulation (EEC) 95/93 aimed at helping new entrants into a market. However, the evidence from airports such as Gatwick and Heathrow is that there is scope for developing these codes further to allow more freedom of effective entry (Civil Aviation Authority, 1995a).
- *The greater use of economic pricing to allocate scarce slots* would encourage the more efficient use of scarce capacity. Peak load premiums and charges which are

more strictly related to economic, rather than accountancy, costs form a key element of this. In general, runway costs are related to aircraft movements and terminal costs to passenger throughput, and this should be reflected in an economic pricing system. The difficulty is one of defining the appropriate costs in the context of airports (Oum and Zhang, 1990) and of developing a pricing regime which allows for the particular needs of airlines offering services across a number of time zones and for which windows for departures and arrivals are small. In practical terms, more efficient pricing may need combining with an administered system.

- *The introduction of auctions for slots* (the property right approach) would involve bringing the allocation of infrastructure capacity more nearly within a competitive framework. There are a number of methods for slot auctioning which would reduce some of the inherent problems of banking (the long-term holding of little-used slots) and would permit the matching of slots at origins and destinations. The problems of the non-divisibility of slots remains, however, and any auction process would inevitably also entail a relatively complex set of operational criteria.
- *Secondary slot trading* involves the buying and selling or exchanging of pre-allocated slots. In some instances, as with the system introduced to a number of US airports in the 1980s, there may be restrictions on the types of trade permitted. Slot trading allows for more efficient use of slots, especially among those enjoying grandfather rights, and permits some scope for new entry. Limitations of trading stem from the possibility of incumbents sitting on slots to prevent a new entrant or another incumbent rival acquiring them, although “use it or lose it” requirements may be invoked to reduce this problem. Technically, there may be difficulties in that trading of slots would seem to contravene the Chicago Convention, which requires that access to airports should be open to all on an equal basis.

The efficient allocation of infrastructure poses problems in aviation, as elsewhere. While both new capacity is coming on line and the ability of existing capacity to take more traffic is increasing, policy is still required to ensure that allocation is efficient. Exchange or pricing regimes could be used to more effect to give airlines greater awareness of the opportunity costs of their operations, but some other approaches, such as the auctioning of property rights to slots, pose serious difficulties in many circumstances.

#### **4. Wider transition considerations**

In addition to the need to ensure that change within the OECD international aviation market is efficient, there are also wider distributional issues to be considered, which may be internal or external to the OECD market.

##### ***Distributional issues***

International aviation is not the only industry that is currently experiencing a major period of restructuring. What one sees in other industries is that while each has undergone, or is undergoing, its own individual transition process, there are nevertheless

common features of importance. One of the most pronounced of these is the quest by those adversely affected by institutional changes to seek some form of protection or compensation during the transition period. Inevitably, some degree of success in obtaining compensation is achieved by those adversely affected by institutional change. While part of this compensation or transitory protection represents a transfer payment, there are adverse consequences for the efficiency of the sector and these should be minimised.

In the context of aviation markets, at the domestic level it is difficult to generalise about the impacts of transition which remove institutional constraints on competition for the market and competition in the market. The 1978 Airline Deregulation Act in the United States, for example, was followed by a rise in employment in the airline industry from 340 000 in 1978 to 450 000 in 1987. This increase, however, was also accompanied by a relative decline in the real incomes of airline employees and substantial changes in work practices. The state of the macroeconomy at the time of transition also influences its impact. In general, the recession of the early 1990s saw airlines shed labour, and it is difficult to disentangle this from changes in institutional arrangements such as the liberalisation of the internal European Union market. Greater efficiency, stemming from liberalisation, combined with technology improvements – which, for example, reduce air crew requirements – can nonetheless have short-term effects on the market for aviation sector employment. In the longer term, however, if restructuring results in lower air fares and services that are matched more closely to consumer requirements, additional traffic will increase employment levels. There will also be secondary, and possibly more important, effects as a more efficient air transport industry will stimulate jobs in sectors such as tourism and other air transport-intensive industries.

In the short term, adverse implications for some fraction of the labour force in the international air transport sector might arise. Such social costs may, in some cases, be lowered by phasing of the transition process, allowing, for example, some adjustment to be taken up in natural wastage. However, unduly long transition periods may run contrary to the primary aim of transition, namely an effective restructuring of the industry. The creation of an institutional environment conducive to restructuring will lead to a more efficient overall use of resources, providing in the process greater opportunities across all sectors.

At the international level, under workable competition comparative advantage will ultimately determine the distributional effects of transition. Removal of excessive restrictions on market entry and exit and on competition in the market will have a business-generating effect, but there are still likely to be carriers which lose out in absolute terms. Transition arrangements could ignore this fact – that is one option. But while some governments might be tempted to provide financial transfer mechanisms offering long-term support for unprofitable carriers, such action would also reduce the efficiency of the transition process and inhibit the long-term development of international aviation.

Another option would be to accept short-term transition arrangements allowing for the protection of carriers until they have undertaken structural adjustments. This approach, as discussed in the subsidy subsection, would require appropriate targets to be set, monitoring arrangements to be put in place, and sunset provisions to be established. It does, however, offer a framework which allows these airlines – which, for historic

reasons, are disadvantaged – to adjust gradually to the challenges of a workably competitive environment and, in longer term, to establish their role, if any, in the market-place.

### ***Global issues***

International aviation extends beyond the confines of OECD countries, and many OECD carriers operate in a global market-place. Equally, OECD Member countries are important markets for airlines from non-OECD countries. For those reasons, transition within the OECD cannot be treated in isolation from what is occurring outside.

This is particularly true if the outlook presented in Chapter 2 – on change and uncertainty – provides even a crude guide to the future pattern of growth of the industry. A difficulty for policy co-ordination stemming from these patterns is that, while there are a number of dynamic aviation nations outside the OECD, many other aviation markets tend to be developing less rapidly than those within the OECD. Where there is expansion, as for example in China, it is often from a much lower base level. Further markets, such as those in the former communist states of central and eastern Europe, are going through a major restructuring phase, the outcome of which remains unclear (C. Smith, 1995). In the former Soviet Union, for instance, the Aeroflot monopoly has given way to some 220 airlines, of which 195 are based in Russia. Some are elements of the old Aeroflot, but there are also new start-ups such as Transaero.

A number of these non-OECD countries have a proclivity to protect their aviation industries through their approach to the bilateral system, often on the grounds of fostering an infant industry. They also may wish, for political reasons, to reassure their sovereignty over their airspace and to use flag-carriers as a mark of national identity. They may be willing to do this even if there are substantial economic costs involved. They are often, therefore, as witnessed at the ICAO 4th Conference on Air Transport in 1994, opposed to rapid liberalisation measures.

These features of many aviation markets outside of the OECD grouping distinguish them from the international airline markets involving the majority of the main industrialised countries. This means that it is unlikely that policies such as global multilateralism will become a reality in the foreseeable future. What is important for a global industry, however, is that transition within the OECD is undertaken in such a way that the airlines of non-members may be in a position to participate fully in any agreements among OECD Members if and when they are interested to do so.

There are a number of transition mechanisms which would allow this to come about. As to which will ultimately be adopted, that will depend as much on the individual designs and aims of the non-OECD countries as on the actions of the Member countries. One possibility is that as regional agreements among the OECD countries develop, features such as standard principles could be embraced by non-OECD nations and thereby integrated into a wider, workably competitive market. In some cases, such as in South America and among some Pacific nations, regional groups are already developing which in themselves may provide the basis for ultimate harmonization and co-ordination with regional arrangements among some groups of Member countries. It is difficult to foresee which of these, if not other alternatives, will prove successful – but given the importance of non-OECD markets to the carriers of states, it is important that dialogue with non-members be maintained.

## BIBLIOGRAPHY

- AIRBUS INDUSTRIE (1993), *Market Perspectives for Civil Jet Aircraft*, Airbus Industrie, Toulouse.
- AIRBUS INDUSTRIE (1994), *The Future for European Airports*, Airbus Industrie, Toulouse.
- ANDERSON, D.L. (1983), "Your Company's Logistic Management: An Asset or a Liability?", *Transportation Review*, Winter, pp. 111-125.
- ANDERSON, K. (1994), "On Measuring the Extent of Agricultural Policy Intervention: A Review of the PSE and Related Indicators", Paper for the Directorate for Food, Agriculture and Fisheries of the OECD, Paris.
- ANDRIEU, M., W. MICHALSKI and B. STEVENS (1992), "Long-term Prospects for the World Economy: Overall Outlook, Main Issues and Summary of Discussion", *Long-Term Prospects for the World Economy*, OECD, Paris.
- ASSOCIATION OF EUROPEAN AIRLINES (1995), *EU External Relations*, AEA, Brussels.
- AVMARK INC. (1992), *The Competitiveness of the European Community's Air Transport Industry*, Report for the Commission of the European Communities, Brussels.
- BAKER, S.H. and J.B. PRATT (1989), "Experience as a Barrier to Contestability in Airline Markets", *Review of Economics and Statistics*, No. 81, pp. 352-356.
- BANISTER, D., B. ANDERSSSEN, J. BERECHMAN and S.D. BARRETT (1993), "Access to Facilities in a Competitive Transport Market", *Transportation Planning and Technology*, No. 17, pp. 341-348.
- BARRETT, S.D. (1987), *Flying High: Airline Prices and European Regulation*, Avebury, Aldershot.
- BENNETT, R.D. and J.M. CRAUN (1993), "The Airline Deregulation Evolution Continues: The Southwest Effect", Paper for the US Department of Transportation.
- BERRY, T. (1990), "Estimating a Model of Entry in the Airline Industry", Yale Working Paper.
- BEYHOFF, S. (1995), *Code-sharing in International Air Transport in the Federal Republic of Germany*, DLR-Forschungsbericht 95-23, Cologne.
- BOEING (1993), *Current Market Outlook*, Seattle.
- BOEING (1994), *Current Market Outlook*, Seattle.
- BOEING (1995a), *Current Market Outlook*, Seattle.
- BOEING (1995b), *World Air Cargo Forecast*, Seattle.
- BOEING (1996), *Current Market Outlook*, Seattle.
- BORNSTEIN, S. (1992), "The Evolution of US Airline Competition", *Journal of Economic Perspectives*, No. 6, pp. 45-73.

- BORENSTEIN, S. and N. ROSE (1994), "Competition and Price Dispersion in the US Airline Industry", *Journal of Political Economy*, No. 102, pp. 653-683.
- BORENSTEIN, S. and N. ROSE (1995), "Do Airlines in Chapter 11 Harm Their Rivals? Bankruptcy and Pricing Behaviour in US Airline Markets", National Bureau of Economic Research, Working Paper 5047, Cambridge, Massachusetts.
- BRADLEY, M. and M. ROSENZWEIG (1992), "The Untenable Case for Chapter 11", *Yale Law Journal*, No. 101, pp. 1043-1095.
- BRITISH AIRWAYS (1994), *Annual Environmental Report*, London.
- BRITISH AIRWAYS (1995), "Global Scenarios 1995-2005", London.
- BRITTAN, L. (1990), "Civil Aviation and 1992 – The Price of Free Movement at Altitude", in P.D. Dagtoglou (ed.), *Air Transport and the European Community*, Brussels, December.
- BRUECKNER, J.K. and P.T. SPILLER (1994), "Economics of Traffic Density in the Deregulated Airline Industry", *Journal of Law and Economics*, No. 37, pp. 379-415.
- BUREAU OF TRANSPORT AND COMMUNICATIONS ECONOMICS (1994), *International Aviation: Trends and Issues*, Australian Government Publishing Service, Canberra.
- BUTTON, K.J. (1988), "High-technology Companies: An Examination of Their Transport Needs", *Progress in Planning*, No. 29, pp. 81-146.
- BUTTON K.J. (1989), "Contestability in the UK Bus Industry, and Experience Goods and Economies of Experience" in J. Dodgson and N. Topham (eds.), *Bus Deregulation and Privatisation: An International Perspective*, Gower, Aldershot.
- BUTTON, K.J. (1993), *Transport, the Environment and Economic Policy*, Edward Elgar, Aldershot.
- BUTTON, K.J. (1995), "Aviation Markets in Europe", Paper to the 105th Annual Meeting of the American Economics Association, Washington, DC.
- BUTTON, K.J. and R. MAGGI (1995), "Videoconferencing and Its Implications for Transport: An Anglo-Swiss Perspective", *Transport Reviews*, No. 15, pp. 59-75.
- BUTTON, K.J. and T. WEYMAN-JONES (1992), "Ownership, Institutional Organisation and Measured X-Inefficiency", *American Economic Review Papers and Proceedings*, No. 82, pp. 439-445.
- BUTTON, K.J. and T. WEYMAN-JONES (1994), "The Impact of Privatisation Policy in Europe", *Contemporary Economic Policy*, No. 12, pp. 23-33.
- BUTTON, K.J., S. TOLOFARI and D. PITFIELD (1986), "Shipping Costs and the Controversy Over Open Registry", *Journal of Industrial Economics*, No. 34, pp. 409-427.
- CAVES, D.W., L.R. CHRISTENSEN and M.W. TRETHERWAY (1984), "Economies of Density Versus Economies of Scale: Why Trunk and Local Service Airline Costs Differ", *The Rand Journal of Economics*, No. 15, pp. 471-489.
- CENTRAL PLANNING BUREAU (1992), *Scanning the Future – A Long-term Study of the World Economy 1990-2015*, Netherlands Central Planning Bureau, The Hague.
- CIVIL AVIATION AUTHORITY (1992), *Economic Regulation of BAA South East Airports 1992-1997*, Civil Aviation Authority, CAP 599, London.
- CIVIL AVIATION AUTHORITY (1993a), *Review of Access to Congested Airports for Regional Services*, Civil Aviation Authority, London.
- CIVIL AVIATION AUTHORITY (1993b), *Airline Competition in the Single European Market*, Civil Aviation Authority, CAP 623, London.

- CIVIL AVIATION AUTHORITY (1994), *Airline Competition on European Long Haul Routes*, Civil Aviation Authority, London.
- CIVIL AVIATION AUTHORITY (1995a), *Slot Allocation: A Proposal for Europe's Airports*, Civil Aviation Authority, CAP 644, London.
- CIVIL AVIATION AUTHORITY (1995b), *The Single European Aviation Market: Progress So Far*, Civil Aviation Authority, CAP 654, London.
- COLTMAN, D.A. (1995), "The Challenge of a Successful Alliance", Paper to the 4th Annual Phoenix International Aviation Symposium, Phoenix.
- COMITÉ DES SAGES FOR AIR TRANSPORT (1994), *Expanding Horizons*, European Commission, Brussels.
- COMMISSION OF THE EUROPEAN COMMUNITIES (1993), *Outline Plan of the Trans-European Airport Network*, Draft Communication VII-C4/Com 2/93, Brussels.
- COMMISSION OF THE EUROPEAN COMMUNITIES (1994), *The Way Forward for Civil Aviation in Europe*, COM(94)218 Final, Brussels.
- COMMISSION OF THE EUROPEAN COMMUNITIES (1995), *Competition Policy in the New Trade Order: Strengthening International Co-operation and Rules*, COM(95)359 Final, Brussels.
- CONDOM, P. (1993), "Airline Industry Performance: Past, Present and Future" in *International Air Transport: The Challenges Ahead*, OECD, Paris.
- COOK, A. and P. HAVER (1994), "Meeting Face to Face – Videoconferencing", *Airline Business*, No. 10 (November), pp. 58-61.
- DAIMLER-BENZ AEROSPACE (1995), *World Market Forecast 1995-2014 for Civil Air Transport*, Daimler-Benz Aerospace AG, Munich.
- DEVOS, S. (1995), "Regional Integration", *OECD Observer*, No. 192, pp. 4-7.
- DIAMOND, D. and N. SPENCE (1989), *Infrastructure and Industrial Costs in British Industry*, HMSO, London.
- DISTEXHE, V. and S. PERELMAN (1994), "Technical Efficiency and Productivity Growth in an Era of Deregulation: The Case of Airlines", *Swiss Journal of Economics and Statistics*, No. 130, pp. 669-689.
- DODGSON, J., Y. KATSOUACOUS and R. PRKYE (1991), *Predatory Behaviour in Aviation*, EC Official Publications, Luxembourg.
- DOGANIS, R. (1991), *Flying Off Course: The Economics of International Airlines, 2nd Edition*, Allen and Unwin, London.
- DOGANIS, R. (1992), *The Airport Business*, Routledge, London.
- DOGANIS, R. (1993), "The Bilateral Regime for Air Transport: Current Position and Future Prospects" in *International Air Transport: The Challenges Ahead*, OECD, Paris.
- DOGANIS, R. and A. LOBBENBERG (1994), "The 'True' Cost of Monopolies", *Airports International*, May, pp. 29-31.
- DOUGLAS AIRCRAFT CO. (1992), *Outlook for Commercial Aircraft*, Long Beach.
- DRESNER, M., S. FLICOP and R. WINDLE (1994), "Trans-Atlantic Airline Alliances: A Preliminary Evaluation", Paper to the Transportation Research Forum 36th Annual Conference, Daytona Beach.
- DRI/McGRAW-HILL (1995), *World Market – Executive Overview, First Quarter*, Lexington.

- ECKEL, C., D. ECKEL and V. SINGAL (1994), "Privatisation and Competition: Industry Effects of the Sale of British Airways and Air Canada", Virginia Polytechnic Institute and State University, mimeo.
- EUROPEAN CIVIL AVIATION CONFERENCE (1994), Report of ECAC/APATSI Seminar on Forecasting Demand, London.
- FEDERAL AVIATION ADMINISTRATION (1993), *Aviation System Capacity Plan*, US Dept. of Transportation, DOT/FAA/ASC-93-1, Washington, DC.
- FIORITA, D.M. (1992), *Globalisation of Aviation and Existing Domestic and International Framework*, Report for the National Transportation Act Review Commission, Montreal.
- FRANCOIS, J., B. McDONALD and H. NORDSTROM (1995), "Assessing the Uruguay Round", Paper presented at the Conference on the Uruguay Round and the Developing Economies, World Bank, Washington, DC.
- GALLACHER, J. (1994), "Tagging Along", *Airline Business*, No. 10 (July), pp. 25-42.
- GELLMAN RESEARCH ASSOCIATES (1994), *A Study of International Airline Code-Sharing*, Report for the US Department of Transportation, Washington, DC.
- GENERAL AGREEMENT ON TARIFFS AND TRADE (1994a), *The Results of the Uruguay Round of Multilateral Trade Negotiations*, GATT, Geneva.
- GENERAL AGREEMENT ON TARIFFS AND TRADE (1994b), *International Trade: Trends and Statistics*, GATT, Geneva.
- GILLEN, D.E., T.H. OUM and M.W. TRETHERWAY (1989), "Privatisation of Air Canada: Why Is It Necessary in a Deregulated Environment?", *Canadian Public Policy*, No. 15, pp. 285-299.
- GORDON, K. (1981), "Deregulation, Rights and the Compensation of Losers" in K.D. Boyer and W.G. Shepherd (eds.), *Economic Regulation: Essays in Honour of James R. Nelson*, Michigan State University Press, East Lansing.
- GUNTHER, J. (1995), "Exploring Future Regulation: 50 Years after the Chicago Convention", *Canadian Aviation Forecast Conference*, Transport Canada, Ottawa.
- HANLON, P. (1994), "Discriminatory Fares: Identifying Predatory Behaviour", *Journal of Air Transport Management*, No. 1, pp. 89-102.
- HEWITT, M. (1994), "OAA Airlines: Where Have All the Profits Gone?", *The Avmark Aviation Economist*, January/February, pp. 9-18.
- HIERONYMI, O. (1993), "Decision-making for Infrastructure: Environmental and Planning Issues" in *Infrastructure Policies for the 1990s*, OECD, Paris.
- HUMPHREYS, B.K. (1991), "Are FFPs Anticompetitive?", *The Avmark Aviation Economist*, July/August, pp. 12-15.
- HUMPHREYS, B.K. (1994a), *New Developments in CRSs*, ITA Documents and Reports 32, Paris.
- HUMPHREYS, B.K. (1994b), "The Implications of International Code Sharing", *The Journal of Air Transport Management*, No. 1, pp. 195-207.
- INTERNATIONAL AIR TRANSPORT ASSOCIATION (1992), *Air Transport in a Changing World: Facing the Challenges of Tomorrow*, IATA, Montreal.
- INTERNATIONAL AIR TRANSPORT ASSOCIATION (1993a), *International Traffic Forecasts 1993-1997 – Scheduled Passengers*, IATA, Geneva.
- INTERNATIONAL AIR TRANSPORT ASSOCIATION (1993b), *Asia/Pacific Air Traffic Growth and Constraints*, IATA, Geneva.



- INTERNATIONAL CIVIL AVIATION ORGANISATION (1967), "Statement by the Council to Contracting States on Charges for Airports and Route Navigation Facilities", Doc. 8718-C/975, ICAO, Montreal.
- INTERNATIONAL CIVIL AVIATION ORGANISATION (1991), *Outlook for Air Transport to the Year 2001*, ICAO, Montreal.
- INTERNATIONAL CIVIL AVIATION ORGANISATION (1993), *Outlook for Air Transport to the Year 2003*, ICAO, Montreal.
- INTERNATIONAL CIVIL AVIATION ORGANISATION (1994a), *The World of Civil Aviation 1993-96*, ICAO, Montreal.
- INTERNATIONAL CIVIL AVIATION ORGANISATION (1994b), *North Atlantic Air Traffic Forecasts for the Years 1994-1999, 2000, 2005 and 2010*, ICAO, Paris.
- INTERNATIONAL CIVIL AVIATION ORGANISATION (1994c), *Report of the Asia/Pacific Area Traffic Forecasting Group (APA TFG) Fourth Meeting*, ICAO, Montreal.
- JONES, I., I. VIEHOFF and P. MARKS (1993), "The Economics of Airport Slots", *Fiscal Studies*, No. 14, pp. 37-57.
- KANAFANI, A. and T. KEELER (1989), "New Entrants and Safety" in L.N. Moses and I. Savage (eds.), *Transportation Safety in an Age of Deregulation*, Oxford University Press, New York.
- KASPER, D.M. (1988), *Deregulation and Globalisation: Liberalising International Trade in Air Services*, American Enterprise Institute, Washington, DC.
- KATZ, R. (1995), "The Great GATS", *Airline Business*, September, pp. 81-82.
- KEELER, T.E. (1990), "Airline Deregulation and Market Performance: The Economic Basis for Regulatory Reform and Lessons from the US Experience" in D. Banister and K.J. Button (eds.), *Transport in a Free Market Economy*, Macmillan, London.
- KLINGMAN, R.A. (1992), "Predatory Pricing and other Exclusionary Conduct in the Airline Industry: Is Antitrust Law the Solution?", *De Paul Business Law Journal*, No. 4, p. 281.
- KRUEGER, A.O. (1992), "Global Trade Prospects for the Developing Countries", *World Economy*, No. 15, pp. 457-474.
- LEVINE, M.E. (1965), "Is Regulation Necessary? California Air Transportation and National Regulatory Policy", *Yale Law Journal* 74, pp. 1416-1447.
- LEVINE, M.E. (1987), "Airline Competition in Deregulated Markets: Theory, Firm Strategy and Public Policy", *Yale Journal on Regulation*, No. 4, pp. 393-494.
- LEVINE, M.E. (1993), "Scope and Limits of Multilateral Approaches to International Air Transport" in *International Air Transport: The Challenges Ahead*, OECD, Paris.
- LEVINE, M.E. (1995), "The Airlines of the Future", Paper to the 8th IATA High Level Symposium, Montreal.
- LIPMAN, G.H. (1995), "Taxing Travel: Seeing the Forests from the Trees", *Viewpoint*, No. 2, pp. 52-60.
- LORTIE, P. (1995), "The Role of Regional Airlines in the Air Transport Industry's Future", Paper to the 8th IATA High Level Symposium, Montreal.
- MALDUTIS, J. (1993), "Industry Investment Requirements – Looking Beyond 2000", Paper to the 7th IATA High-level Aviation Symposium, Cairo.
- MARCONINI, M. (1995), "Aviation and the New World Trading Regime", Paper to the PECC Conference on Air Transport in the Asia-Pacific: Challenges, Opportunities and Options, Singapore.

- MEYER, J.R. and B.W. TYE (1985), "The Regulatory Transition: The Consequences of Deregulation in the Transportation and Telecommunications Sector", *American Economic Review: Papers and Proceedings*, No. 75, pp. 46-51.
- MICHALSKI, W. (1983), "The Need for Positive Adjustment Policies in the 1980s", *Inter Economics*, January/February, pp. 42-47.
- MICHALSKI, W. and M. ANDRIEU (1992), "Long-term Prospects for Structural Shifts: Fundamental Trends, Main Driving Forces and Major Uncertainties" in *Korea and the World in the 21st Century, Presidential Commission on the 21st Century*, Seoul.
- MICHALSKI, W., M. ANDRIEU and B. STEVENS (1993), "New Policy Approaches to International Air Transport: Main Issues and Summary of the Discussion" in *International Air Transport: The Challenges Ahead*, OECD, Paris.
- MOKHTARIAN, P.L. (1990), "A Typology of Relationships between Telecommunications and Transportation", *Transportation Research*, No. 24A, pp. 31-42.
- MORRISON, S. and C. WINSTON (1986), *The Economic Effects of Airline Deregulation*, Brookings Institution, Washington, DC.
- MORRISON, S. and C. WINSTON (1989), "Enhancing the Performance of the Deregulated Air Transportation System", *Brookings Papers on Economic Activity, Microeconomics*, pp. 61-112.
- MORRISON, S. and C. WINSTON (1995), *The Evolution of the Airline Industry*, Brookings Institution, Washington, DC.
- MULLAN, H. (1995), "Financing the Future", Paper to the 8th IATA High Level Symposium, Montreal.
- NYATHI, M., P. HOOPER and D. HENSHER (1993), "Compass Airlines: 1 December 1990 to 20 December 1991 – What Went Wrong?," *Transport Reviews*, Part 1, No. 13, pp. 112-149; Part 2, No. 13, pp. 185-206.
- OECD (1975), *The Polluter Pays Principle*, Paris.
- OECD (1983), *Long Term Outlook for the World Automobile Industry*, Paris.
- OECD (1985), *Costs and Benefits of Protection*, Paris.
- OECD (1986), *Competition Policy and Joint Ventures*, Paris.
- OECD (1987), *Structural Adjustment and Economic Performance*, Paris.
- OECD (1988), *Deregulation and Airline Competition*, Paris.
- OECD (1989a), *Predatory Pricing*, Paris.
- OECD (1989b), *Economic Instruments for Environmental Protection*, Paris.
- OECD (1992a), *Globalisation of Industrial Activities – Four Case Studies: Auto Parts, Chemicals, Construction and Semiconductors*, Paris.
- OECD (1992b), *Market and Government Failures in Environmental Policy: The Case of Transport*, Paris.
- OECD (1992c), *Regulatory Reform, Privatisation and Competition Policy*, Paris.
- OECD (1992d), *Trade and Competition Policies*, Paris.
- OECD (1993a), *Assessing the Effects of the Uruguay Round*, Paris.
- OECD (1993b), *Long-Term Prospects for the World Economy*, Paris.
- OECD (1993c), *Infrastructure Policies for the 1990s*, Paris.

- OECD (1993d), *International Air Transport: The Challenges Ahead*, Paris.
- OECD (1993e), *Competition Policy and a Changing Broadcasting Industry*, Paris.
- OECD (1993f), *1993 Issues: The OECD Response*, Paris.
- OECD (1994a), *Globalisation of Industrial Activities: A Case Study of the Clothing Industry*, Paris.
- OECD (1994b), *OECD Economic Outlook*, No. 56, Paris.
- OECD (1994c), *Globalisation of Industrial Activities: A Case Study of the Consumer Electronics Industry*, Paris.
- OECD (1994d), *OECD Societies in Transition: The Future of Work and Leisure*, Paris.
- OECD (1994e), *Tourism Policy and International Tourism in OECD Countries*, Paris.
- OECD (1994f), *Competition Policy in OECD Countries*, Paris.
- OECD (1995a), *Foreign Direct Investment – OECD Countries and Dynamic Economies of Asia and Latin America*, Paris.
- OECD (1995b), *Regional Integration and the Multilateral Trading System – Synergy and Divergence*, Paris.
- OECD (1995c), *OECD Economic Outlook*, No. 57, Paris.
- OECD (1995d), “Coverage of Competition Laws and Policies: Overview”, Document to the Working Party of the Trade Committee, Paris.
- OECD (1995e), Revised Recommendation of the Council Concerning Co-operation between Member Countries on Anti-competitive Practices Affecting International Trade, C(95)130 Final, Paris.
- OUM, T.H. and Y. ZHANG (1990), “Airport Pricing: Congestion Tolls, Lumpy Investment and Cost Recovery”, *Journal of Public Economics*, No. 43, pp. 353-374.
- OUM, T.H., W.G. WATERS and J.-S. YONG (1992), “Concepts of Price Elasticities of Transport Demand and Recent Empirical Estimates: An Interpretative Survey”, *Journal of Transport Economics and Policy*, No. 26, pp. 139-154.
- PROUSSALOGLU, K. and F. KOPPELMAN (1995), “Air Carrier Demand: An Analysis of Market Share Determinants”, *Transportation*, No. 22, pp. 371-388.
- RODRIGUES, C. (1993), “Travel and Tourism Forecasts: 2000 and Beyond”, *Viewpoint*, No. 1, pp. 34-40.
- ROSSELL, M. (1995), “Airline Deregulation in the United States: A Model for Europe”, Hubert H. Humphrey Institute, Minneapolis (mimeo).
- RYAN, K.J. (1994), “Future Logistic Management Requires Seamless Global Transportation System”, *Logistics Spectrum*, Winter, pp. 6-8.
- SALOP, S.C. and D.T. SCHEFFMAN (1983), “Raising Rivals’ Costs”, *American Economic Review, Papers and Proceedings*, 73, pp. 267-271.
- SAVAGE, S., D. SMITH and J. STREET (1994), “The Effect of Competition on International Air Fares”, Paper to the Conference of Economists, Surfers Paradise, Brisbane, Queensland, Australia.
- SHENTON, H. (1994), “Code-sharing Is Airlines’ Gain Consumers’ Loss”, *The Avmark Aviation Economist* (October), pp. 13-20.
- SMEETS, M. (1993), “The Car in the World Economy”, *OECD Observer*, No. 180, pp. 23-25.
- SMITH, C. (1995), “Western Rethink”, *Airline Business*, September, pp. 57-62.

- SMITH, T.K. (1995), "Why Air Travel Doesn't Work", *Fortune*, April, pp. 26-36.
- SPRAGGINS, H.B. (1989), "The Impact of Airline Size upon Efficiency and Profitability", *Journal of Transportation Management*, No. 23, pp. 73-104.
- STEVENS, B. and W. MICHALSKI (1993), "Infrastructure in the 1990s: An Overview of Trends and Policy Issues" in *Infrastructure Policies for the 1990s*, OECD, Paris.
- STIRLAND, R. (1995), "Politics and Policy: A Time for Opportunity?", Paper to the 4th Annual Phoenix International Aviation Symposium, Phoenix.
- STREET, J., P. SPENCE and D. SMITH (1993), "Entry and Exit Conditions for Australian Aviation", Paper to the 18th Australian Transport Research Forum, Gold Coast.
- TELSER, L.G. (1994), "The Usefulness of Core Theory in Economics", *Journal of Economic Perspectives*, No. 8, pp. 151-164.
- TRADE PRACTICES COMMISSION (1992), *The Failure of Compass Airlines*, TPC, Canberra.
- TRANSPORT CANADA (1993), *An Evaluation for the Accuracy of Aviation – Activity Forecasts*, TP9400E, Transport Canada, Ottawa.
- TRANSPORT CANADA (1994), *Transport Canada Aviation Forecasts 1994-2007*, Transport Canada, Ottawa.
- UNITED KINGDOM ROYAL COMMISSION ON ENVIRONMENTAL PROTECTION (1995), *18th Report, Transport and The Environment*, HMSO, London.
- UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (1994), *World Investment Report 1994 – Transnational Corporations, Employment and the Workplace*, UN, Geneva.
- UNITED STATES DEPARTMENT OF TRANSPORTATION (1990), *Airline Marketing Practices: Travel Agencies, Frequent-Flier Programs, and Computer Reservation Systems*, Secretary's Task Force on Competition in the US Domestic Airline Industry, Washington, DC.
- UNITED STATES DEPARTMENT OF TRANSPORTATION (1995), *US International Air Transportation Policy Statement*, DOT, Washington, DC.
- UNITED STATES GENERAL ACCOUNTING OFFICE (1990), *Airline Competition: Industry Operating and Marketing Practices Limit Market Entry*, GAO/RCED-90-147, Washington, DC.
- UNITED STATES GENERAL ACCOUNTING OFFICE (1994), *International Aviation: DOT Needs More Information to Address US Airlines' Problems in Doing Business Abroad*, GAO/RECD-95-24, Washington, DC.
- UNITED STATES GENERAL ACCOUNTING OFFICE (1995), *International Aviation: Airline Alliances Produce Benefits, But Effect on Competition is Uncertain*, GAO/REED-95-99, Washington, DC.
- UNITED STATES GENERAL ACCOUNTING OFFICE (1996), *Airline Deregulation: Changes in Airfares, Service, and Safety at Small, Medium-Sized and Large Communities*, GAO/RCED-96-79, Washington, DC.
- UNITED STATES NATIONAL COMMISSION TO ENSURE A STRONG COMPETITIVE AIRLINE INDUSTRY (1993), *Change, Challenge and Competition*, US Government Printing Office, Washington, DC.
- UNITED STATES TRANSPORTATION RESEARCH BOARD (1993), *Aviation Infrastructure – Panel on Future Aviation Activities*, Transportation Research Board, Washington, DC.

- VAN HASSELT, L. (1994), "Prospects for Changes in the Regulation of International Civil Aviation", *Journal of Air Transport Management*, No. 1, pp. 83-88.
- VICKERY, G. (1993), "Global Industries and National Policies", *OECD Observer*, No. 179, pp. 11-14.
- WESTBROOK, J.L. (1990), "Comparison of Bankruptcy Reorganisation in the US with the Administration Procedure in the UK", *Insolvency Law and Practice*, 86/88.
- WHITE, L.J. (1979), "Economies of Scale and the Question of Natural Monopoly in the Airline Industry", *Journal of Air Law and Commerce*, No. 44, pp. 545-573.
- WORLD BANK (1995), *Global Economic Prospects and the Developing Countries*, Washington, DC.
- WORLD TOURISM ORGANISATION (1994), *Global Tourism Forecasts to the Year 2000 and Beyond*, WTO, Brussels.
- WORLD TRAVEL AND TOURISM COUNCIL (1993), *Travel and Tourism Forecasts*, WTTC, Brussels.
- WYCKOFF, A.W. (1993), "The International Expansion of Productive Networks", *OECD Observer*, No. 180, pp. 8-11.
- YAMANOUCHI, S. (1995), "Rail's High-tech Resurgence", *Viewpoint*, No. 1, pp. 18-24.
- YOUSSEF, W. and M. HANSEN (1994), "Consequences of Strategic Alliances between International Airlines: The Case of Swissair and SAS", *Transportation Research*, No. 28A, pp. 415-431.



## GLOSSARY

**Air service agreement (ASA).** Government-to-government agreement establishing the conduct of trade in international air services. Most are bilateral air service agreements negotiated between two countries. Provisions addressed in air service agreements vary, but can include market access, routes, freedoms granted, capacity, flight frequency and methods for determining tariffs.

**Available seat kilometres (ASKs).** ASKs are a measure of air transport passenger capacity and are calculated as the total number of seats offered multiplied by the distance flown.

**Barriers to entry and/or exit.** Legal, institutional and economic factors that limit the ability of (both new and existing) airlines to enter or exit a particular market.

**Beyond rights.** The right of designated airlines to fly services from one foreign country to another foreign country. Fifth freedom rights are one type of beyond rights.

**Bilateral agreement.** Covers a formal arrangement between two governments covering trade in air services. The phrase is often used to refer to an air service agreement.

**Cabotage.** The right of foreign-owned airlines to provide commercial domestic air services in a host country.

**Chapter 11 bankruptcy provisions (US).** Allows firms declared bankrupt in the United States an opportunity to be reorganised and recapitalised to remain operating, in an effort to trade out of difficulties.

**Code-sharing.** A marketing arrangement between airlines allowing them to sell seats on each other's flights under their own designator code. In the case of connecting flights of two or more code-sharing carriers, the whole flight is displayed as a single carrier service on a CRS.

**Computer reservation system (CRS).** The electronic data management system which distributes information, availability status and price of travel services to retailers and directly to consumers.

**Consolidation.** Reduction in the number of airlines serving a market either through airline closure – allowing remaining airlines an opportunity to increase their market share – or through the acquisition of an airline by another airline. Airline consolidation results in an increase in market concentration among airlines remaining in the market.

**Contestability.** An economic theory which emphasizes the importance of potential entry by new firms for efficient price and service outcomes. The more effective the threat of entry, the smaller any excess profit accruing to existing airlines serving the market.

**Costs.** Total airline costs can be divided into:

- **Operating costs.** All expenses incurred in providing air transport services, including fuel costs, flight crew costs, and passenger service costs.
- **Non-operating costs.** All expenses incurred by an airline not directly related to the production of airline services, including interest expenses and gains (or losses) on the sale of aircraft.
- **Direct operating costs.** All expenses associated with flight operation, maintenance and the capital costs of the airline.
- **Indirect operating costs.** All expenses not associated with flight operation, maintenance and capital costs of the airline. Such costs include user charges (landing and other airport charges) and station expenses; passenger services; ticketing, sales and promotion; and general and administrative expenses.
- **Sunk costs.** Cost which cannot be recovered if a supplier leaves the market.
- **Variable costs.** All expenses which are directly proportional to the amount of the service provided, including flight costs and user charges.
- **Fixed costs.** All expenses which do not vary as the quantity of services produced changes, including depreciation and amortisation expenses, flight crew training, and station expenses.

**Debt/equity.** The ratio of debt to equity shows the proportions of funding by holders of debt and equity securities, and is used as a measure of financial risk.

**ECAC.** European Civil Aviation Conference.

**Economies of scale.** Average unit cost of production declines as airline output increases.

**Economies of scope.** One airline can produce two or more services more cheaply than if those same services were produced separately by different carriers.

**Economies of traffic density.** Average unit cost of production declines as the amount of traffic increases between any given set of points served.

**Economies of network size.** Average unit cost of production declines as the number of city points served by an airline's network increases.

**Efficiency.** Economic measure of the best use of resources. Allocative efficiency refers to the optimum allocation of scarce resources between end-users in order to produce a combination of goods and services which best meets the pattern of consumer demand. X-efficiency refers to the effectiveness of an airline's management in minimising the costs of producing a given level of output.

**Elasticity.** The responsiveness of the quantity demanded to changes in factors such as price and income.

**EU.** European Union.

**Flag-carrier.** Countries with only a government-owned airline often identify the airline as the national carrier or flag-carrier.



**Freedoms.** International aviation rights of passage.

- **1st freedom.** The right of an airline of one country to fly over the territory of another country without landing.
- **2nd freedom.** The right of an airline of one country to land in another country for non-traffic reasons, such as maintenance or refuelling, while en route to another country.
- **3rd freedom.** The right of an airline of one country to carry traffic from its country of registry to another country.
- **4th freedom.** The right of an airline of one country to carry traffic from another country to its own country of registry.
- **5th freedom.** The right of an airline of one country to carry traffic between two countries outside its own country of registry as long as the flight originates or terminates in its own country of registry.
- **6th freedom.** The right of an airline of one country to carry traffic between two foreign countries via its own country of registry. This is a combination of third and fourth freedoms.
- **7th freedom.** The right of a carrier to operate stand-alone services entirely outside the territory of its home state, to carry traffic between two foreign states.
- **8th freedom.** The right of an airline to carry traffic between two points within the territory of a foreign state (cabotage).

**Freight tonne kilometres (FTKs).** The number of tonnes of air freight times the distance carried. FTKs may be measured for a single flight, an airline, or industry wide.

**Frequent flyer programme.** A scheme offering flights or other benefits to travellers who fly long distances or often. The qualification criteria can be based on the distance travelled or the number of trips taken, and are usually weighted by the class of ticket purchased. These programmes are expanding to include other services unrelated to travel.

**Government intervention failure.** See **Market distortions.**

**Grandfather rights.** The allocation of airport landing and take-off slots based on past and/or current access.

**Hub and spoke network.** An airline operating structure where one or more airports act as the focus of an airline's operations. In a hub and spoke network, traffic is collected from a number of "spoke" or feeder points and consolidated at the hub point prior to redistributing traffic out of the hub to connect with flights to another destination.

**Hush-kitting.** A muffling operation that reduces the noise emitted by aircraft engines.

**IATA.** International Air Transport Association.

**ICAO.** International Civil Aviation Organization.

**Infrastructure.** Air traffic control facilities, runways, and airport passenger terminals.

**Interlining.** Carriage of passengers and freight by one airline on behalf of another airline, based on a formal arrangement (an interline agreement) between the airlines.

Carriers involved in an interlining agreement are required to honour tickets issued by other carriers in the agreement. The identity of each carrier is maintained.

**Lease.** A rental agreement that involves a series of fixed payments.

- **Operating lease** is a shorter-term aircraft rental agreement under which the aircraft reverts to the lessor at the end of the lease.
- **Finance lease** is a longer-term aircraft rental agreement, usually extending for the economic life of the aircraft, often with an option for the lessee to purchase the aircraft at the end of the lease.
- A **wet lease** involves the provision of an aircraft and the operating crew.
- A **dry lease** involves the provision of an aircraft, but the operating crew is supplied by the lessee.

**Load factor.** A percentage measure of airline traffic as a proportion of airline capacity. Passenger load factor is the number of passengers carried as a percentage of the number of seats available. Weight load factor is the number of tonne kilometres performed as a percentage of tonne kilometres available.

**Market distortions.** These stem from two general sources:

- **Market failure.** The market may fail to produce an efficient outcome because of intrinsic features such as the existence of natural monopoly power.
- **Government intervention failure.** Intervention by government in markets (*e.g.* through regulations) may lead to a lessening of economic efficiency.

**Multiple designation.** Nomination of more than one airline to operate international air services from the home country to a particular country.

**Nonscheduled (or charter) services.** Flights performed for remuneration on an irregular basis.

**Operating costs.** See **costs**.

**Operating revenues.** All earnings from the conduct of air transport services and related activities, including scheduled and nonscheduled passengers and freight and mail services.

**Privatisation.** The sale of publicly owned assets or businesses (for example airlines) to the private sector.

**Revenue passenger kilometres (RPKs).** The number of paying passengers on an aircraft times the number of kilometres flown. RPKs may be measured for a single flight, an airline or industry wide.

**Scheduled services.** Flights listed in a published timetable, or so regular and frequent as to constitute a recognisably systematic series, and performed for remuneration.

**Slots.** The right to land and/or take off from an airport at a specified time.

**Social service (or public services).** A commercially non-viable service which is provided to meet social needs, for example services to afford remote communities adequate access.

**Structural adjustment.** Productive undertakings alter their methods of and approaches to production or the nature of their output in response to changes in consumer demands, technological shifts or developments in the competitive framework.

**Tendering.** A bidding system whereby the right to supply a non-profitable service is awarded to the supplier requiring the lowest subsidy.

**Tonne kilometres available (TKA).** A measure of tonnes available for the carriage of freight, mail and passengers, times the distance flown. TKA may be measured for a single flight, an airline or industry wide.

**Tonne kilometres performed (TKP).** A measure of tonnes of freight, mail and passengers actually carried times the distance flown. TKA may be measured for a single flight, an airline or industry wide.

**Transition.** Government policy changes designed to facilitate structural adjustment in the economy.

**WTO.** World Tourism Organisation.

**WTTC.** World Travel and Tourism Council.

**X-efficiency.** See **Efficiency.**

**Yield.** Airline revenue per unit of traffic. Passenger yield is airline revenue per passenger kilometre.

**Yield management.** Manipulation of seat prices to obtain the most revenue from each flight. Yield management systems are based on estimating the number of full fare tickets that would be sold on a particular flight and then offering the remaining tickets at varying discounts to induce demand from more price-sensitive passengers. The discounted tickets generally have strict conditions to make these tickets less attractive to those passengers who are willing to pay full fare.



*Annex 1*

**THE JAPANESE VIEW ON “INTRODUCTION, EXECUTIVE SUMMARY AND POLICY RECOMMENDATIONS” OF “THE OECD PROJECT ON INTERNATIONAL AIR TRANSPORT”**

Some major arguments in the “Introduction, Executive Summary and Policy Recommendations”, particularly those concerning the role of the current bilateral agreements in the development of international air services, impacts of “liberalization”, relaxation of foreign ownership in air carriers and application of general competition laws, are considered to be based not upon the reality of today’s international air services but upon misconceptions. We strongly object to those arguments, and our view on them is given below. We believe that the majority of the countries in the world share our view as evidenced in the conclusion of the ICAO World Wide Air Transport Conference in 1994 which was reached by a consensus of the 137 countries represented there.

1. It is the current bilateral system that has brought about the dramatic development in international air transportation, having coped with great economic, social or technological changes and having enhanced consumers’ interests. This system is functioning effectively and there is no persuasive reason to believe that unexpected upheavals will occur, which the current system, that has adapted to such great changes as the oil crisis and the emergence of jet airplanes and wide body airplanes, cannot adjust to. The current bilateral system has shown the flexibility to accommodate the geographical characteristic and the social and economic conditions of a given market.

2. Liberalization has merits, but surely it is not defect free. Hasty liberalization without safeguards generally has a tendency towards cut-throat competition, which may, in some cases, even press air carriers to cut indispensable safety expenditures, and towards the creation of monopolies or oligopolies, and, in the international air transport market, towards aggravation of unlevel competitive conditions and loss of effective participation of countries. In this regard, an OECD Report entitled “Competition, Regulation and Performance” [ECO/CPE/WP1(95)6/ANN2] correctly pointed out the following:

US deregulation led to a phase with new entry (to a total of 123 market participants) and increased competition. This was followed by a period of consolidation, where bankruptcies, mergers and take-overs reduced the number of market participants to 27, of which the 12 largest covered 97.3 per cent of the market in 1988. Interestingly, this development has led to a similar degree of concentration in the United States as in Europe and a situation where individual airports tend to be dominated by a single airline. Australia saw a similar process towards concentration in the run-up to and following deregulation in 1990.

Also as pointed out by many researchers, fares have increased in concentrated markets and a decrease in service to scarcely populated or remote areas has often been observed after the Deregulation.

Another important point is that the benefits of the Deregulation are overestimated greatly by some researchers who neglect the general downward trend of real air fares which had continued before the Deregulation. In this respect, it should also be noted that this downward trend of real air fares has been continuing all over the world, not only in “liberalized” markets, but also in other markets.

It is clear that liberalization without preventive safeguard measures or hasty liberalization is not acceptable to many countries in the world, as witnessed at the ICAO Conference.

3. In this connection, it should be noted that every country, including pro-liberalization countries, wishes to maintain its own national carriers in the international air transport market, regarding them indispensable for national or regional economic and technological development.

[Excerpt from “Change, Challenge and Competition – A Report to the President and Congress”, The National Commission to Ensure a Strong Competitive Airline Industry, August 1993]

“I think there is a real consensus in America that the people who make airplanes and equipment and the people who run our airlines are critical to our economic future”, the President said.

The air transportation system has become essential to economic progress for the citizens and business of this nation. Without it, our country will be hamstrung in its ability to participate in an increasingly global community and marketplace.

[Excerpt from “Expanding Horizons – A Report by the Comité des Sages for Air Transport to the European Commission”, Jan. 1994].

...the homebase location of the airlines is highly important for the positive spillover effects they have on the European economy as a whole.

...the quality of Europe’s air transport system would suffer if non-European airlines were the only significant service providers in Europe.

...a genuine European Air Transport Industry is a key industry for the overall economic welfare of Europe.

4. The framework of international aviation should be decided by related sovereign countries, and we are not opposed to liberalizing a market based on a mutual agreement between the related countries. However, one country should never impose “liberalization” which is apt to create a monopoly or oligopoly and has a risk of loss of effective participation in international air transport of the other side, while leaving a vast domestic market reserved to the national carriers of one side intact, thereby creating an unlevel playing field.

5. Relaxation of foreign ownership may result in flags of convenience and should accordingly be carefully considered. It is not sound to propose its relaxation before adequate and effective safeguard measures have been agreed upon among the countries concerned.

6. It is not sound to presume that general competition laws are capable of adequately dealing with monopoly, oligopoly or anti-competitive practices in international air transport. A quick and speedy remedy to the problem under general competition laws cannot be expected in international air transport, and ex post facto measures often result in unrecoverable damage to one side. In this respect, safeguards provided in a bilateral air services agreement have a great advantage over general competition laws.

In addition, a series of anti-trust immunities recently granted to the alliances between mega-carriers show another evidence that general competition laws are actually ineffective to prevent market concentration in the aviation industry.

7. It is certain that capacity constraints in major international airports will remain for a prolonged period, and there is no fundamental remedy for this, as was admitted in the report too. This also

makes it impossible to compete freely. (Although some ideas to improve capacity constraints are discussed in the report, they do not go so far as to eliminate the constraints of major international airports.)

8. If a further study is to be made, it should be made in a forum where all of the participants in the international air transportation market can participate. In this regard, ICAO, which is the most appropriate organization for such a task, has already started this kind of study with the participation of 25 countries, including 10 OECD countries. Duplication of work should be avoided for the consideration of efficient usage of limited resources.





*Annex 2*

**THE STEERING GROUP TO THE OECD INTERNATIONAL  
AIR TRANSPORT PROJECT**

The Steering Group consisted of representatives from the governments of OECD Member countries, the European Commission, airlines, airports, aircraft manufacturers, airfuel suppliers and tourism groups, all of which contributed financially to the project. The Group was chaired by the Secretary-General of the OECD – Mr. Jean-Claude Paye (until May 1996) and subsequently Mr. Donald Johnston.

**Principal Participants in Meetings of the Steering Group\***

<b>Aeromexico</b> Mexico	Francisco CONTRERAS	Senior Vice President, International Development
<b>Airbus Industrie</b> France	Michel BIELER	Directeur des relations internationales
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\* Positions are those held at the time of participation in the Group.

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# THE FUTURE OF INTERNATIONAL AIR TRANSPORT POLICY

## Responding to Global Change

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